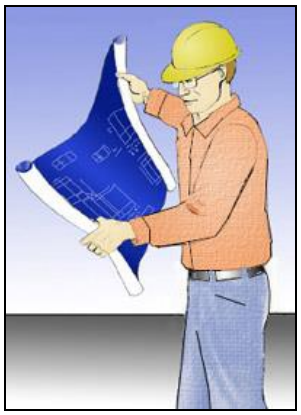
Competent Person Program

Applied to Fall Protection:

Fall Protection Training

4-hour

First Edition



UMDNJ SCHOOL OF PUBLIC HEALTH
University of Medicine & Dentistry of New Jersey

University of Medicine & Dentistry of New Jersey (UMDNJ)

School of Public Health (SPH)

Office of Public Health Practice (OPHP)

Table of Contents

Appendices

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Office of Public Health Practice

UMDNJ- School of Public Health Practice

683 Hoes Lane West, Suite 110

Piscataway, New Jersey, 08854

Phone (732) 235-9450

OPHP Staff

Koshy Koshy, Principal Investigator, koshyko@umdnj.edu

Mitchel A. Rosen, Co-Principal Investigator, mrosen@umdnj.edu

Elizabeth Marshall, Director of Evaluation

Mehul Patel, Program Development Specialist

Gina Gazitano, Program Coordinator

Stanley Rosen, Course Developer and Instructor

Michael Presutti, Course Developer and Instructor

John Malool, Course Instructor

Introduction

Perhaps the most important people on construction sites today are persons referred to by the United States Department of Labor's Occupational Safety and Health Administration (OSHA) Title 29 Code of Federal Regulation (CFR) 1926.32 as *competent persons*. The actual term *competent person* is used in many OSHA standards, documents, directives as well as several proprietary and private standards and guidelines. OSHA defines the term "*competent person*" as, "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them" (29 CFR 1926.32(f)). Though the actual responsibilities in code varies and will be discussed in this program as they pertain to fall protection, generally, such persons, whom often act on the employer's behalf, must possess the ability to anticipate, protect and prevent injuries and illnesses when applied to actual and specific work performed by themselves and other employees. In several instances, competent person too must be able to train employees. It's important to understand that when regulation mandates the use of *competent persons*, it is an employer's obligation to determine the ability of such individuals and designate them accordingly by their knowledge of standards, experience at the task at hand and ability to take corrective action. Keep in mind that the authority to take corrective action can vary from having the knowledge to make something safe and hazard free to simply not allowing work to be performed, hence preventing employee exposure.

Perennially, the absence of *competent persons* is among the most frequently cited violations by the OSHA and of course this omission reflects a proportionate number of accidents and fatalities, especially in the hazard category of falls. OSHA leaves latitude for the practical application of how employers create competent person programs to safeguard employees, it is hence a performance-based term, meaning simply regardless of how the employer arrives at having competent persons based on knowledge and experience, the program must be effective, it must work to protect workers. Flexibility in performance-based mandates can often lead to confusion and

ambiguity that can unfortunately lead to a false sense of compliance and worse a false sense of security for workers. This is especially true concerning falls, which remain the highest cause of death in the construction industry. Yet, the proper use of real and effective competent persons provides us with the greatest opportunity to save lives.

This program will attempt to demonstrate how to implement, maintain and work within an effective competent person program. As a working model for a *competent person* program, it will also serve to train workers and managers in various fall protection hazard recognition, awareness and prevention. We will delve into the legal and constitutional powers of OSHA along with the inherent rights of workers and employers as well as the more specific areas of fall protection safeguards and requisite training.

Ideally, this program will help employers, managers, and employees become familiar with the expectations of an effective competent person program and benchmark against their own existing programs.

This course program will also try to clear up some of the ambiguity surrounding various issues including what credentials, experience, ability, authority and other characteristics *competent persons* should possess. It may be said, that one employer's *competent person* may be dissimilar in duties and scope to another employer's, yet OSHA may not view either employers' *competent persons* competent or perhaps one and not the other, or believe both competent. Competent persons are typically persons such as crew foreman or supervisors overseeing actual construction processes, with no say necessarily in engineering design nor legal obligatory responsibility, yet possessing great discretion to act on employers' behalf and determined to be competent by such employers.

Section One: Rights and Responsibilities

It would be wise to start any undertaking with some reasonable anticipation of what obstacles you will likely encounter as it is indeed essential that on a jobsite the employer must provide the means of assessing and identifying potential hazards and where applicable utilize competent persons in construction. In a sense, an *assessment phase* of your existing program is an investigation phase, where we help determine what can go wrong. In our assessments we must keep in mind that we are evaluating people, materials, equipment, the environments and existing processes to which all interact and the competent person's role is vital.

We must always keep in mind the mandatory nature of the use of effective competent persons flows directly from The Williams-Steiger Occupational Safety and Health Act of 1970, which can also be referred to as, "The Occupational Safety and Health Act of 1970" (OSH Act). The primary purpose of the OSH Act is to assure, so far as possible, safe and healthful working conditions for every working man and woman, but in various places the OSH Act or OSHA regulations clearly spells out the responsibility of an employer and employees:

> The Occupational Safety and Health Act of 1970: "General Duty Clause"
> 5. General Duties
> (a) Each employer
> (1) *shall furnish to each of his employees* employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
> (2) *shall comply with* occupational safety and health standards promulgated under this Act.
> (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

Within OSHA 29 1926 there are several mandates that require employers to train employees, to which the competent persons must and should play a significant role due to the their advanced experience and knowledge. Subpart C of 1926.21, Safety training and education, states under (b) Employer responsibility:

> (2) The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.

Throughout this OSHA code of regulations for the construction industry there are references and mandates that explicitly direct mandatory training including fall hazards, which are the highest risk hazard, and the leading cause of deaths in the construction industry. Subpart M of CFR 29 1926 is the Fall Protection subpart and requires a mandatory fall protection training that must also be certified, to which competent person that are qualified must perform. Similar obligatory language is found in Subpart L of CFR 29 1926 which covers scaffolding.

Subpart M, 1926.503 requires employers to provide a training program for each employee who “might” be exposed to fall hazards. Referencing falls to a lower level in height, the word “might” speaks of the possibility of a worker falling more than 6 feet. Reality beckons one then to ask oneself how many construction workers would not be exposed to such fall hazards? Also note in code that competent persons must perform this essential training and a certified proof, with signatures, be accessible to OSHA. How many of us can say we, or members of our companies, actually possess such fall protection training and the requisite corresponding proof thereof?

> 1926.503 Training requirements
> (a) Training Program.
> (1) The employer shall provide a training program for each employee who <u>might</u> be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

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

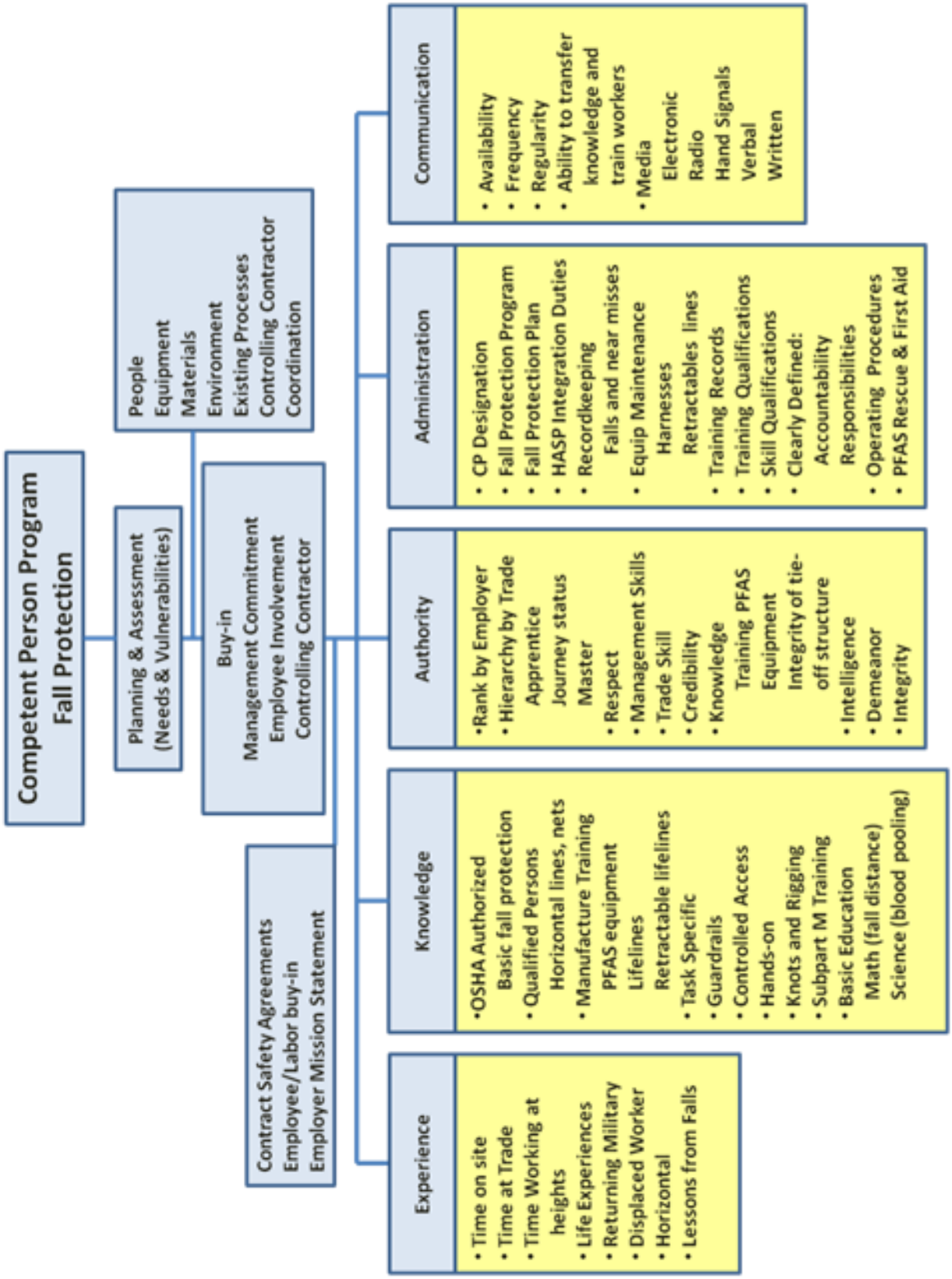
(b) Certification of training.

(1) The employer shall verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record shall contain the name or other identity 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.

(c) Retraining. When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (a) of this section, the employer shall retrain each such employee.

Exercise: Rights and Responsibilities: Can you remember receiving certified fall protection training yourself? If so can you describe what you learned, who performed the training and where on your jobsites are the fall protection certifications kept? In the space below provide your observations, remarks and comments.

Section Two: Competent Person Models



Section Three: Fall Protection Training

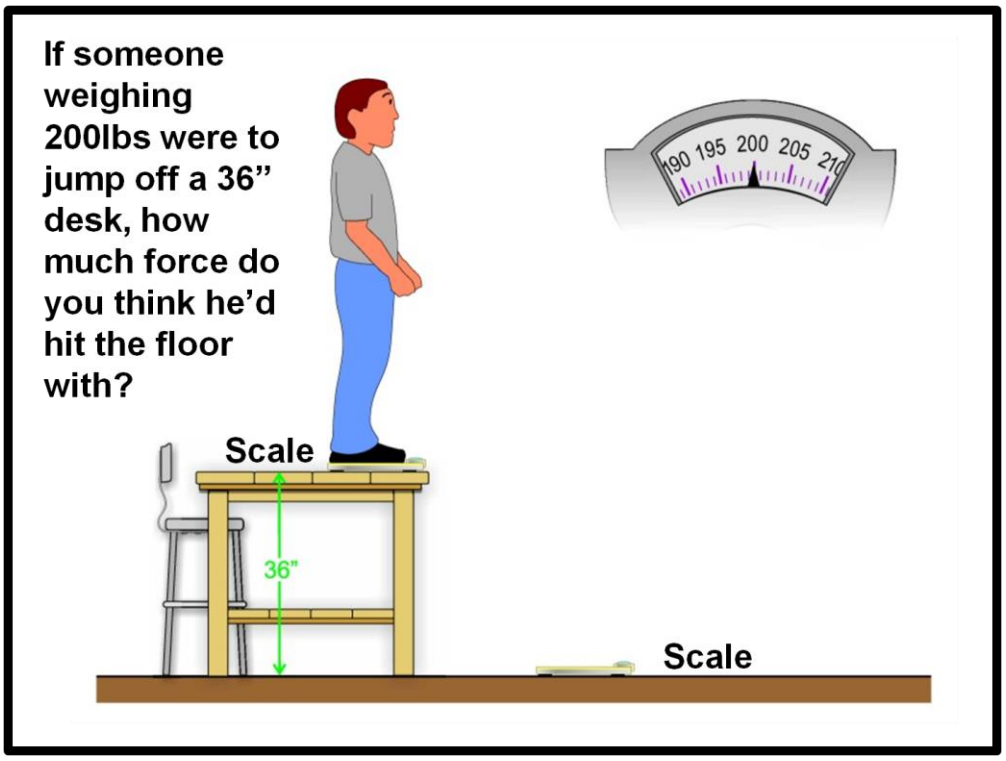
A. Fall Prevention and Protection

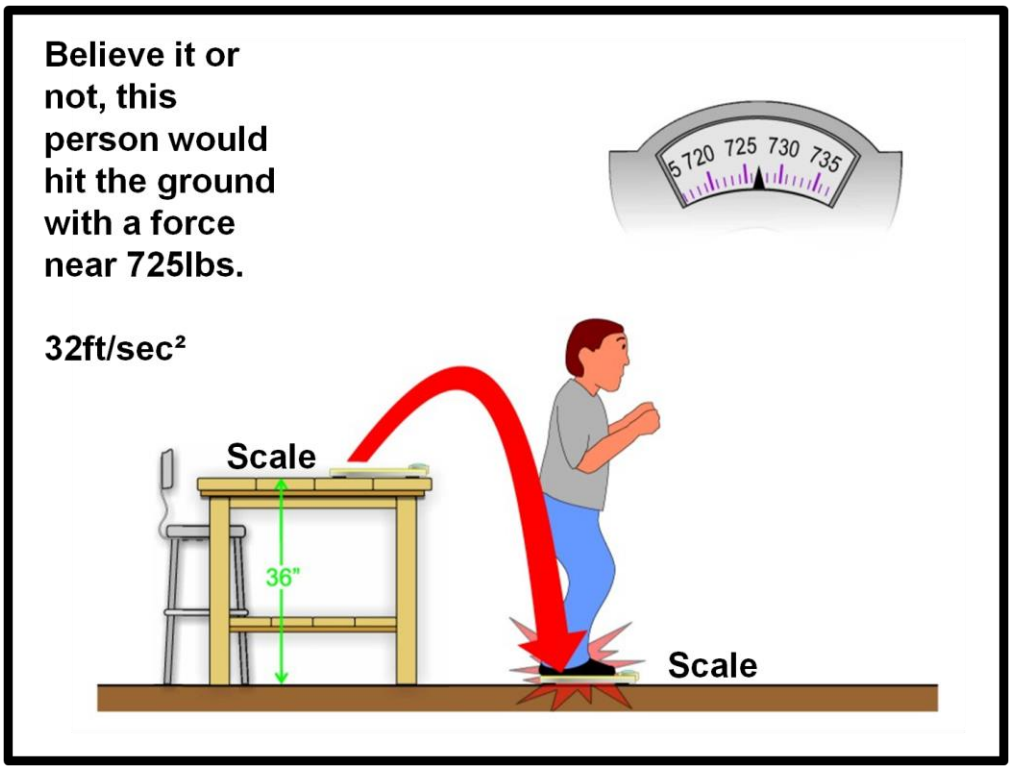
As stated above, adults learn best by "connecting the dots," they want to answer the question "why," so it's an employer's responsibility, ideally through the competent person to train workers in the nature of falls; in other words, it's the employer's responsibility to demonstrate the nature of fall hazards to employees; show them how the effects of falls, which is due of course to the force of gravity, can do harm or worse cause death. Keep in mind, it is mandatory to train workers in the nature or falls, for those workers whom might be exposed to a falls of more than 6 feet. Can you think of anyone whom might NOT be exposed to such hazards?

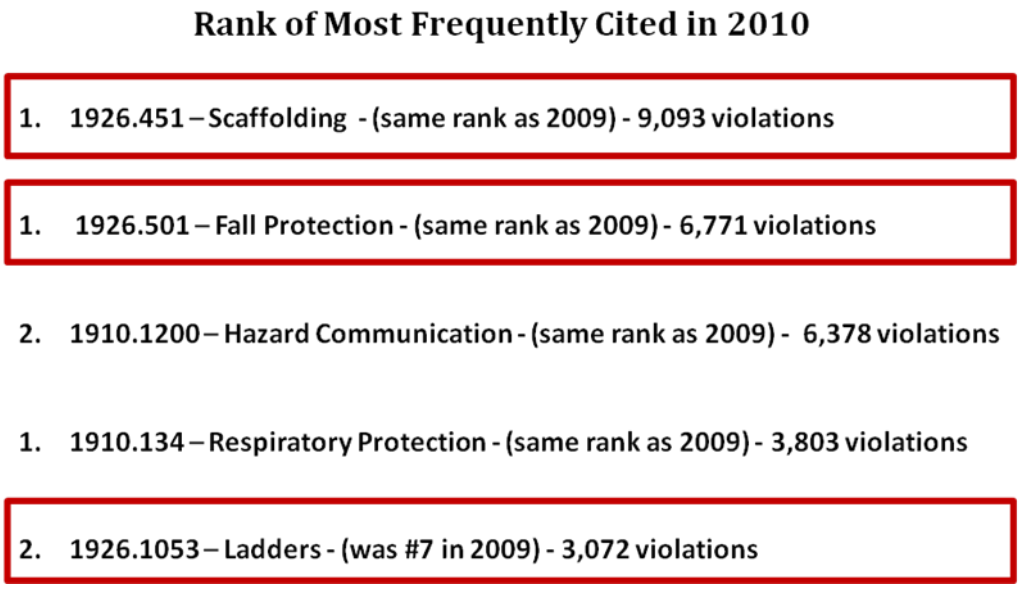
The problem with falls often lies with most people being unaware of the actual forces involved with falling. Many workers simply don't realize the extreme forces of gravity and this oversight often leads them to second guess all the OSHA associated numbers, such as a tie-off point of 5000lbs, which could dangle the weight of a mid-size pick-up truck from, as being excessive or overkill, while in fact these numbers are based on simple mathematic formulas. So there exists a disconnect between theory and the so called "real world.".

This disconnect between theory and real on the job practice can be erased by simply applying the formula of Isaac Newton's second law: ma=f (Mass X Acceleration= force). In each fall protection training you should explain the nature of falls and how gravity pulls objects toward earth and how these objects get heavier and faster as they fall and hence the impact force also becomes greater. For example explain that a 200 pound person jumping off a 3 foot desk onto a bathroom scale, would hit the scale with a force greater than twice their weight. Ask workers to guess before giving them the answer. Show them that 32feet/second^2 actually means that for the first second of time an object will fall 32 feet and that on the next second the object will get heavier and faster. Allow workers to connect the dots. Tell them that the impact may not feel like 725lbs

because the impact is transferred and distributed by your muscles, bones and connective tissue, such as ligaments, tendons, cartilage.







B. What are the most frequently cited serious violations of the fall protection provisions?

- ☐ Failure to protect workers from falls of 6 feet of more off unprotected sides or edges, e.g. floors and roofs. (1926.501(b)(1); (b)(10); and (b)(11))
- ☐ Failure to protect workers from falling into or through holes and openings in floors and walls. (1926.501(b)(4) and (b)(14))
- ☐ Failure to provide guardrails on runways and ramps where workers are exposed to falls of 6 feet or more to a lower level. (1926.501(b)(6))

C. What are some effective control measures that can be used for the serious hazards for which OSHA has most frequently cited employers?

- ☐ Determine if any of the work (even a small portion) can be performed at ground level or if a crane can be used to lift assembled portions (e.g., sections of roofing) into place, eliminating or reducing the number of workers exposed to falling.
- ☐ Tether or restrain the worker so he or she cannot reach the edge thereby eliminating the fall hazard.

- ☐ Consider the use of aerial lifts or elevated platforms to provide better working surfaces rather than walking top plates or beams.
- ☐ Erect guardrail systems, warning lines, or control line systems to protect workers from falls off the edges of floors and roofs.
- ☐ Place covers over holes as soon as they are created if no work is being done at the hole.
- ☐ Use safety net systems, or personal fall arrest systems (body harness)

D. What good work practices can be used to provide protection from falls when conventional systems are not feasible?

- ☐ Designate one of the workers as a safety monitor to observe employees and to alert employees of hazards that could cause them to trip or fall.
- ☐ Establish a designated area or control zone in which workers when conventional fall protection systems such as guardrails and personal fall arrest systems are not feasible or create a greater hazard.
- ☐ Store materials in an area away from where workers are exposed to fall hazards.

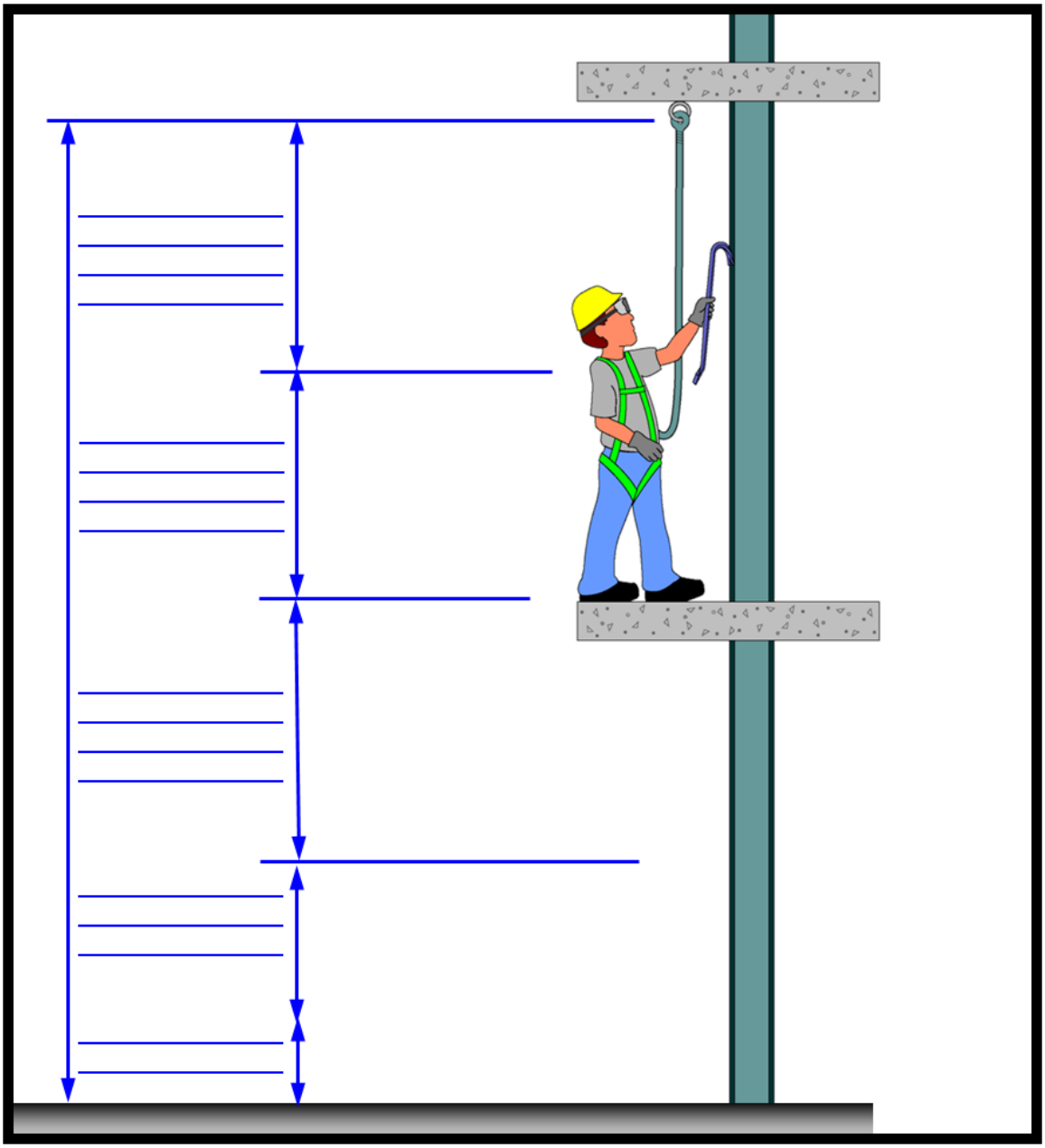
E. Personal fall arrest systems

A personal fall arrest system may consist of a full body harness, a deceleration device, a lanyard, and an anchor point. **:** A PFAS is designed to safely stop a fall before the worker strikes a lower level. It includes three major components: An anchorage to which the other components of the PFAS are rigged. A full body harness worn by the worker. A connector, such as a lanyard or lifeline, linking the harness to the anchorage. A rip-stitch lanyard, or deceleration device, is typically a part of the system. In personal fall arrest a worker must be anchored to a point where is can hold 5000lbs of arresting force. OSHA allows the use of an effective fall restraint system in lieu of a personal fall arrest system. To be effective, a fall restraint system must be rigged to prevent a worker from reaching a fall hazard and falling overthe edge. A fall restraint system may consist of a full body harness or body belt that is connected to an anchor point at the center of a roof

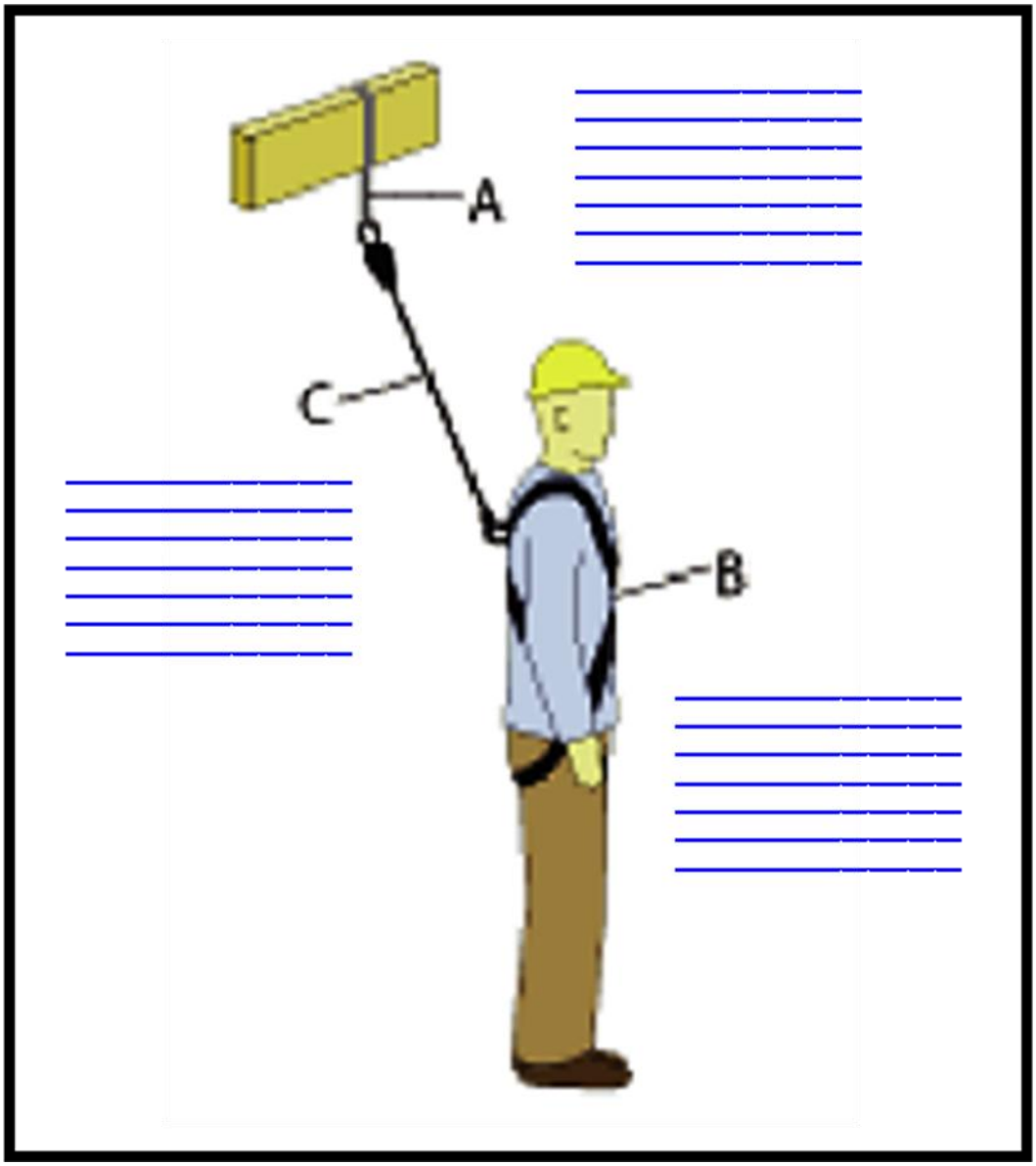
by a lanyard of a length that will not allow a worker to physically reach the edge of the roof.

Exercise: Personal Fall Arrest System

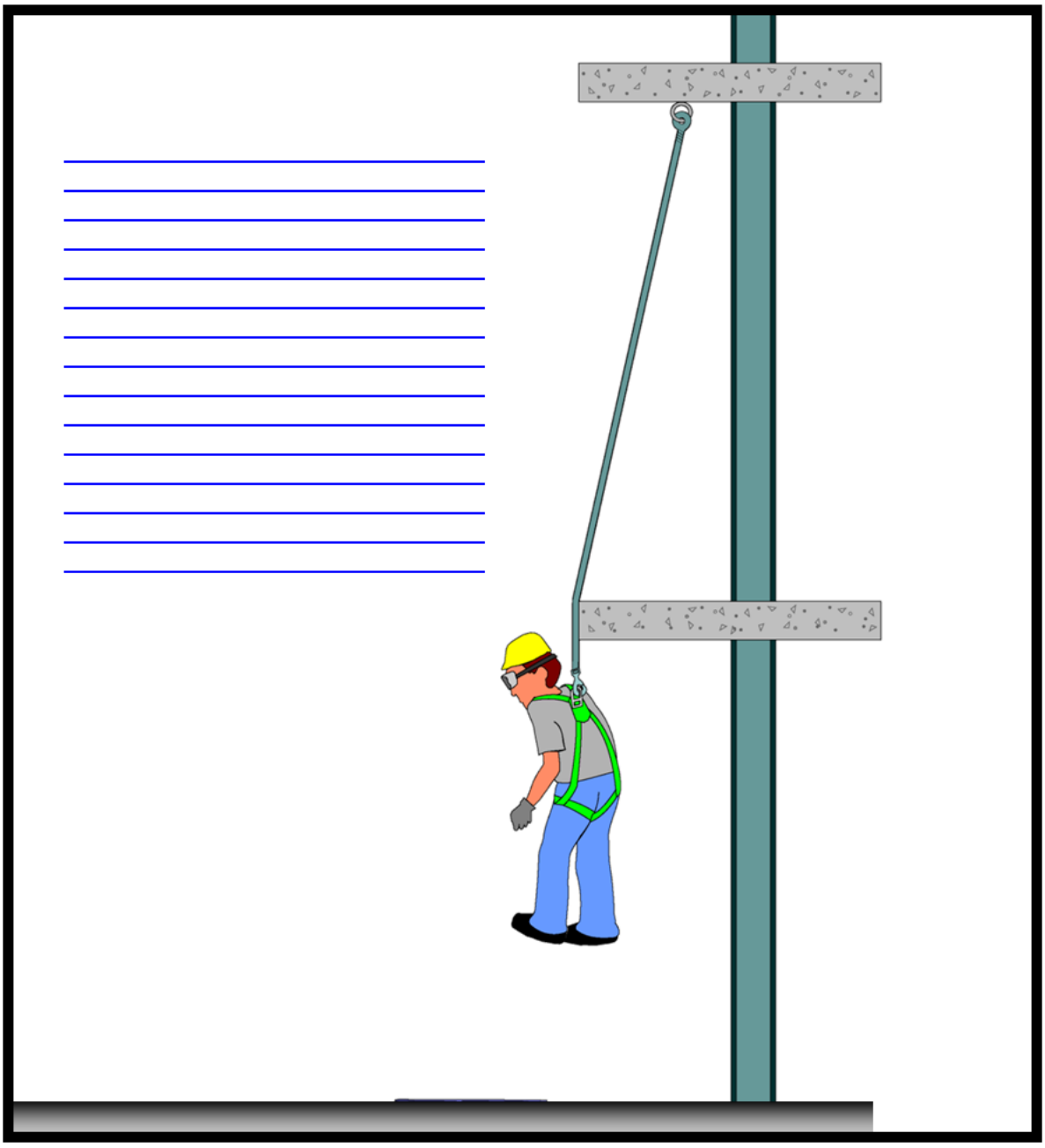
Let's see if we can talk about what is require if a worker utilizes



Exercise: Personal Fall Arrest System (PFAS): A PFAS is designed to safely stop a fall before the worker strikes a lower level. It includes three major components: An **anchorage** to which the other components of the PFAS are rigged. A full body **harness** worn by the worker. A connector, such as a **lanyard or lifeline**, linking the harness to the anchorage. A rip-stitch lanyard, or deceleration device, is typically a part of the system. See if you can find these components and provide some critical information about these components.



Exercise: Personal Fall Arrest System (PFAS): Describe what you think the role of each employee would be in the event of someone falling while wearing a personal fall protection harness attached to an anchorage point. Describe where you would find such information and how you would come about learning what to do.



F. Hierarchy of Controls

Performing a Job Hazard/Safety Analysis JHA/JSA is fundamental to controlling events that could cause harm to employees or property. Since it is always best to work through some delineated structure to avoid haphazard and arbitrary guesswork, safety and health professionals have long used the Job Hazard Analysis (JHA), also commonly referred to as Job Safety Analysis (JSA) along with an applied hierarchy of controls. Just as a checklist may guide us through a walk-through audit on a worksite, so does the structure of a JHA/JSA and a hierarchy of controls guide us when applying controls to our workplaces. Keep in mind that you always want to start to select controls first from the most protective choices and work your way downward, only discounting more protective controls because of infeasibility. Nearly every job can be broken down into smaller job tasks or steps. When beginning a job hazard analysis, watch the employee perform the job and list each step as the worker takes it. Be sure to record enough information to describe each job action without getting overly detailed. Avoid making the breakdown of steps so detailed that it becomes unnecessarily long or so broad that it does not include basic steps. You may find it valuable to get input from other workers who have performed the same job. Later, review the job steps with the employee to make sure you have not omitted something. Point out that you are evaluating the job itself, not the employee's job performance. Always keep in mind that employee evolvement is critical to ultimate success of our venture, so include the employee in all phases of the analysis—from reviewing the job steps and procedures to discussing uncontrolled hazards and recommended solutions.

Fall Protection
Assessment of Hazards

Task	Hazard	Control	Means of Implementation
Connecting Steel	Falls to a lower level	1. Personal Fall Arrest System 2. Retractable lifelines	1. Purchase PFAS equipment 2. Train Workers to use PFAS equipment 3. Subpart M Training
Installing wire rope perimeter protection	Falls to below	1. Prefabrication of perimeter wire rope before steel is hoisted into place	1. Contract with steel fabricator to deliver steel with wire rope perimeter protection in place or have iron workers install protections at ground level before hoisting into place.

A. Leading Cause of Fatalities

Falls are the leading cause of fatalities in the construction industry. It is important that safety and health programs contain provisions to protect workers from falls on the job. The following hazards cause the most fall-related injuries:

- ☐ Unprotected sides, wall openings, roofs, floor holes,
- ☐ Improper scaffold construction,
- ☐ Unguarded or protruding steel rebar,
- ☐ Misuse of portable ladders.

B. Scaffolds General

An estimated 2.3 million construction workers, or 65 percent of the construction industry, work on scaffolds. Protecting these workers from scaffold-related accidents may prevent some of the 4,500 injuries and over 60 deaths every year (Bureau of Labor Statistics (BLS). 72 percent of workers injured in scaffold accidents attributed the accident either to the planking or support giving way, or to the employee slipping or being struck by a falling object. All of these accidents

can be controlled by compliance with OSHA standards and it makes business sense too, because injuries cost employers money.

- ☐ Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person.
- ☐ A competent person shall inspect the scaffold, scaffold components, and ropes on suspended scaffolds before each work shift and after any occurrence which could affect the structural integrity and authorize prompt corrective action.
- ☐ Training: Each employee who performs work on a scaffold shall be trained by a person qualified to recognize the hazards associated with the type of scaffold used and to understand the procedures to control or minimize those hazards. The training shall include such topics as the nature of any electrical hazards, fall hazards, falling object hazards, the maintenance and disassembly of the fall protection systems, the use of the scaffold, handling of materials, the capacity and the maximum intended load.
- ☐ Fall protection (guardrail systems or personal fall arrest systems) must be provided for each employee on a scaffold more than 10 feet (3.1 meters) above a lower level.
- ☐ Each scaffold and scaffold component shall support without failure its own weight and at least 4 times the maximum intended load applied or transmitted to it. Suspension ropes and connecting hardware must support 6 times the intended load. Scaffolds and scaffold components shall not be loaded in excess of their maximum intended loads or rated capacities, whichever is less.
- ☐ Planks and Platforms: Bad planks are a leading cause of falls from scaffolding. So the scaffold platform shall be planked or decked as fully as possible and the platform shall not deflect more than 1/60 of the span when loaded.
- ☐ The work area for each scaffold platform and walkway shall be at least 18 inches (46 centimeters) wide. When the work area must be less than 18 inches (46 centimeters) wide, guardrails and/or personal fall arrest systems shall still be used.

- ☐ Access must be provided when the scaffold platforms are more than 2 feet (0.6 m) above or below a point of access. Direct access is acceptable when the scaffold is not more than 14 inches (36 centimeters) horizontally and not more than 24 inches (61 centimeters) vertically from the other surfaces. Crossbraces shall not be used as a means of access.
- ☐ Scaffold, Bricklaying: Employees doing overhand bricklaying from a supported scaffold shall be protected by a guardrail or personal fall arrest system on all sides except the side where the work is being done.
- ☐ Scaffold, Erectors and Dismantlers: A competent person shall determine the feasibility for safe access and fall protection for employees erecting and dismantling supported scaffolds.
- ☐ Scaffold, Fall Arrest Systems Personal fall arrest systems used on scaffolds must be attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member. Vertical or horizontal lifelines may be used.
- ☐ Lifelines shall be independent of support lines and suspension ropes and not attached to the same anchorage point as the support or suspension ropes.
- ☐ Employees must be tied off when working from an aerial lift. Fall restraint systems or personal fall arrest systems may be used. The use of personal fall arrest systems must comply with Subpart M.

Scaffold, Guardrails

- ☐ Guardrails shall be installed along all open sides and ends of platforms before the scaffold is released for use by employees other than the erection and dismantling crews. Guardrails are not required on the front edge of a platform if the front edge of the platform is less than 14 inches (36 centimeters) from the face of the work. For plastering and lathing, the distance is 18 inches (46 centimeters) or less from the front edge. When outrigger scaffolds are attached to supported scaffolds the distance is 3 inches (8 centimeters) or less from the front edge of the outrigger.

- ☐ The toprail for scaffolds must be 38 inches (0.97 meters) to 45 inches (1.2 meters) from the platform. Midrails are to be installed approximately halfway between the toprail and the platform surface.
- ☐ Toeboards or other barriers are to be used to protect employees working below.
- ☐ When screens and mesh are used for guardrails, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.
- ☐ Crossbracing is not acceptable as an entire guardrail system but is acceptable for a toprail when the crossing point of the two braces is between 38 inches (0.9 meters) and 48 inches (1.3 meters) above the work platform and for midrails when between 20 inches (0.5 meters) and 30 inches (0.8 meters) above the work platform. The end points of the crossbracing shall be no more than 48 inches (1.3 meters) apart vertically.

Scaffolds, Mobile

- ☐ Scaffolds shall be braced by cross, horizontal, or diagonal braces, or a combination thereof. Scaffolds must be plumb, level, and squared. All brace connections must be secured.
- ☐ Each employee on a scaffold more than 10 feet above a lower level shall be protected from falling to that lower level by use of guardrail systems or personal fall arrest systems.

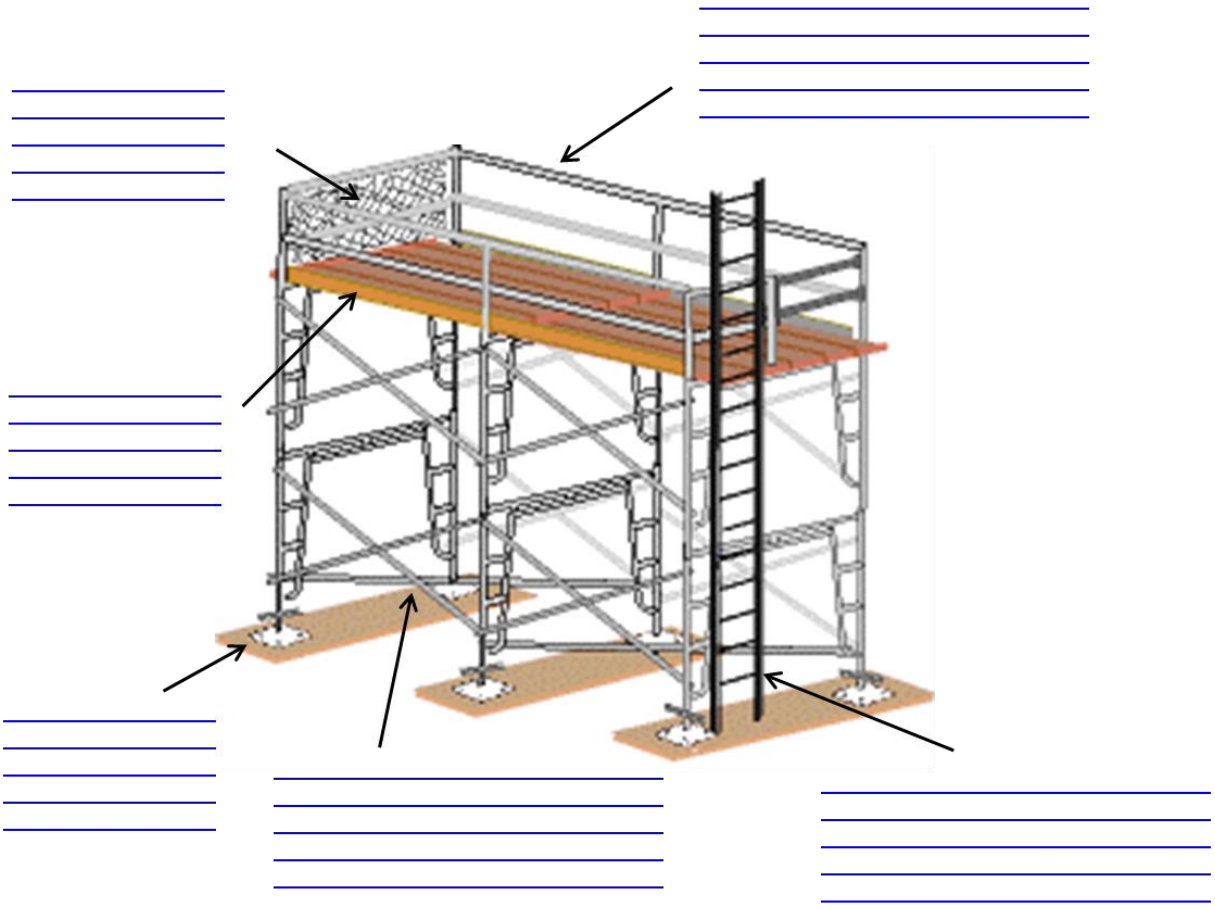
Scaffold, Planking

- ☐ Scaffold planking shall be capable of supporting without failure its own weight and at least 4 times the intended load. Solid sawn wood, fabricated planks, and fabricated platforms may be used as scaffold planks, following the recommendations by the manufacturer or a lumber grading association or inspection agency. Tables showing maximum permissible spans, rated load capacity, nominal thickness, etc., are in Appendix A of Subpart L (1)(b) and (c).

Scaffolds, Supported

- ☐ Supported scaffolds are platforms supported by legs, outrigger beams, brackets, poles, uprights, posts, frames, or similar rigid support. The structural members, poles, legs, posts, frames, and uprights, shall be plumb and braced to prevent swaying and displacement.
- ☐ Supported scaffolds poles, legs, posts, frames, and uprights shall bear on base plates and mud sills, or on another adequate firm foundation.

Exercise: Supported Scaffold. Can you name the component parts of a supported scaffold and list important safety concerns and facts associated with that component?



Supported Scaffold Competent Person Checklist

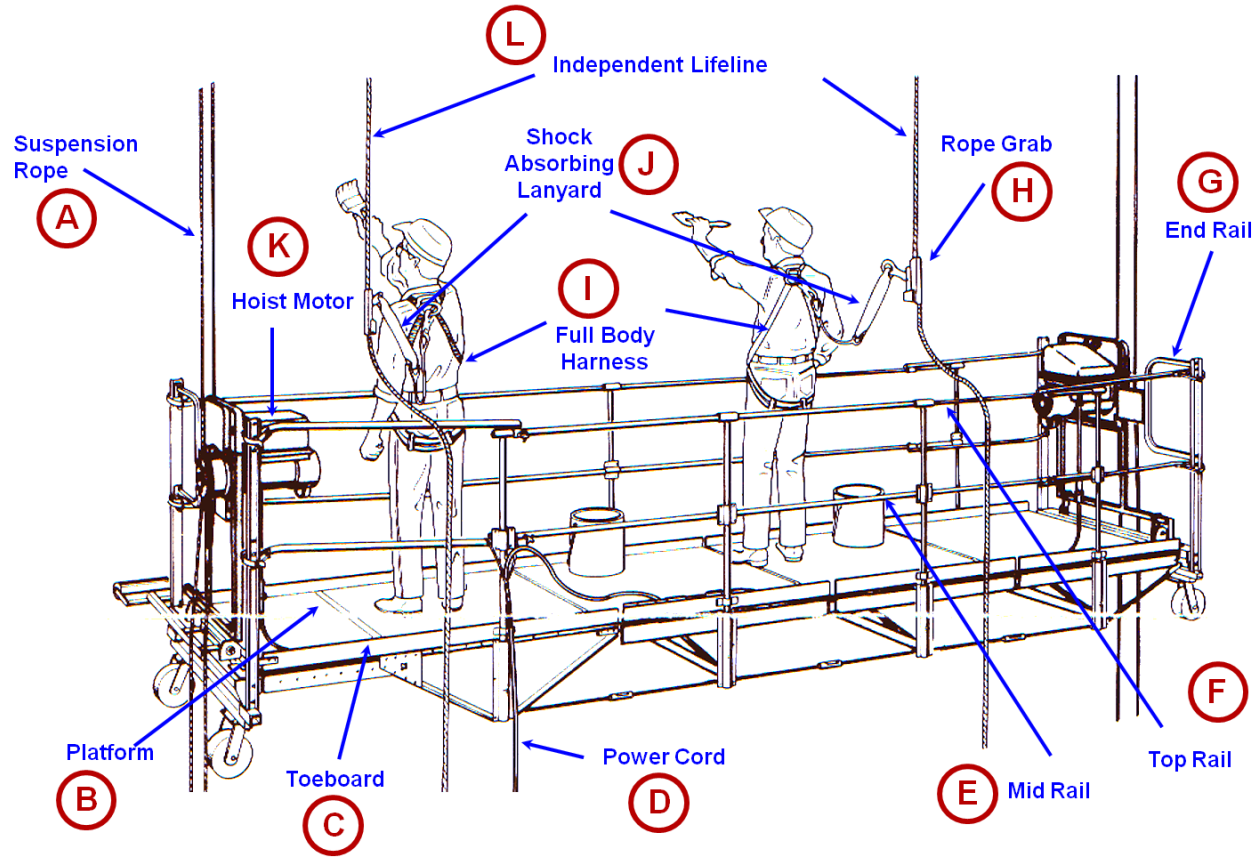
- ☐ Check legs, posts, frames, and uprights to see if they are on baseplates and mudsills.
- ☐ Check metal components for bends, cracks, holes, rust, welding splatter, pits, broken welds, and non-compatible parts.
- ☐ Check for safe access. Do not use the crossbraces as a ladder for access or exit.
- ☐ Check wooden planks for cracks, splits greater than one-quarter (1/4) inch, end splits that are long, many large loose knots, warps greater than one-quarter (1/4) inch, boards and ends with gouges, mold, separated laminate(s), and grain sloping greater than 1 in 12 inches from the long edge and are scaffold grade lumber or equivalent.
- ☐ If the planks deflect one-sixtieth (1/60) of the span or 2 inches in a 10-foot wooden plank, the plank has been damaged and must not be used.
- ☐ Check to see if the planks are close together, with spaces no more than 1 inch around uprights.
- ☐ Check to see if 10-foot or shorter planks are 6 to 12 inches over the center line of the support, and that 10-foot or longer planks are no more than 18 inches over the end.
- ☐ Check to see if the platform is 14 inches or less away from the wall or 18 inches or less away if plastering or stucco.
- ☐ Check for guardrails and midrails on platforms where work is being done.
- ☐ Check for employees under the platform and provide falling object protection or barricade the area. Make sure that hard hats are worn.
- ☐ Use braces, tie-ins and guying as described by the scaffold's manufacturer at each end, vertically and horizontally to prevent tipping.

Suspension Scaffolding (Swing)

- ☐ Each employee more than 10 feet (3.1 meters) above a lower level shall be protected from falling.
- ☐ Each employee 10 feet (3.1 meters) above a lower level shall be protected from falling by a personal fall arrest system when working from a boatswain's chair, ladder jack, needle beam, float, or catenary scaffolds.
- ☐ Lifelines shall be independent of support lines and suspension ropes and not attached to the same anchorage point as the support or suspension ropes.
- ☐ A competent person shall inspect the ropes for defects prior to each workshift and after every occurrence which could affect a rope's integrity, evaluate the direct connections that support the load, and determine if two-point and multi-point scaffolds are secured from swaying.
- ☐ Do not use repaired wire ropes.
- ☐ Tiebacks secured to structurally sound anchorage on the building or structure, not standpipes, vents, other piping systems, or electrical conduit.
- ☐ A single tieback shall be installed perpendicular to the face of the building or structure. Two tiebacks installed at opposing angles are required when a perpendicular tieback cannot be installed.
- ☐ Only those items specifically designed as counterweights shall be used. Sand, gravel, masonry units, rolls of roofing felt, and other such materials shall not be used as counterweights.
- ☐ Counterweights used for suspended scaffolds shall be made of materials that cannot be easily dislocated.
- ☐ Counterweights shall be secured by mechanical means to the outrigger beams

Exercise: Suspended Scaffolds

See if we can write an important safety fact about each component of a suspended scaffold. Alongside the lettered space below write a fact or two about the various suspended scaffolding components. Example: L. Independent Lifeline: Must be able to hold 5000lbs of force and used only for one worker.



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L. _____

C. Fall Prevention and Protection in Residential Construction

With the issuance of the new directive, all residential construction employers must comply with 29 CFR 1926.501(b)(13). Residential construction employers generally must ensure that employees working six feet or more above lower levels use guardrails, safety nets, or personal fall arrest systems.

- ☐ If the employer can demonstrate that use of conventional fall protection methods is infeasible or creates a greater hazard, it must ensure that a qualified person:
  - ☐ Creates a written, site-specific fall protection plan in compliance with 29 CFR 1926.502(k); *and*
  - ☐ Documents, in that plan, the reasons why conventional fall protection systems are infeasible or why their use would create a greater hazard The new directive interprets “residential construction” as construction work that satisfies both of the following elements:
    - The end-use of the structure being built must be as a home, i.e., a dwelling.
    - The structure being built must be constructed using traditional wood frame construction materials and methods. The limited use of structural steel in a predominantly woodframed home, such as a steel I-beam to help support wood framing, does not disqualify a structure from being considered residential construction.

- Traditional wood frame construction materials and methods will be characterized by: *Framing materials:* Wood (or equivalent cold-formed sheet metal stud) framing, not steel or concrete; wooden floor joists and roof structures. *Exterior wall structure*: Wood (or equivalent cold-formed sheet metal stud) framing or masonry brick or block. *Methods*: Traditional wood frame construction techniques.

☐ Other fall protection measures may be used to the extent allowed under other provisions of 29 CFR 1926.501(b) addressing specific types of work. For example, 1926.501(b)(10) permits the use of warning lines and safety monitoring systems during the performance of roofing work on low-sloped roofs.

☐ OSHA allows the use of an effective fall restraint system in lieu of a personal fall arrest system. To be effective, a fall restraint system must be rigged to prevent a worker from reaching a fall hazard and falling over the edge. A fall restraint system may consist of a full body harness or body belt that is connected to an anchor point at the center of a roof by a lanyard of a length that will not allow a worker to physically reach the edge of the roof.

☐ Traditional wood frame construction materials and methods will be characterized by:

- *Framing materials*: Wood (or equivalent cold-formed sheet metal stud) framing, not steel or concrete; wooden floor joists and roof structures.

- *Exterior wall structure*: Wood (or equivalent cold-formed sheet metal stud) framing or masonry brick or block.

- *Methods*: Traditional wood frame construction techniques.

Examples of Various Fall Protections Applied to Residential Construction

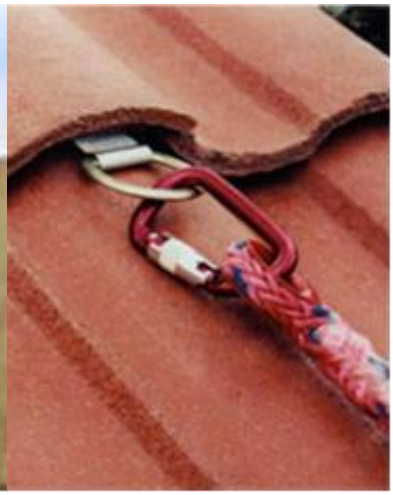
Ladders

Bracket Scaffolds

Fall Restraint

Concrete Anchors

Rebar Anchors



Roof Anchors

Roof Anchor Brackets

Nets

Bracket Scaffold Guardrails

Mobile Scaffolds

Truss Bracket Anchor

Aerial Lift

Bracket Scaffold

D. Stairways and Ladders

Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries.

- ☐ Read and follow all labels/markings on the ladder.
- ☐ Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- ☐ Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.
- ☐ Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- ☐ Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose. Portable Ladder Safety TM
- ☐ Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).
- ☐ Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- ☐ Ladders must be free of any slippery material on the rungs, steps or feet.
- ☐ Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- ☐ Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.
- ☐ Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- ☐ Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- ☐ Do not move or shift a ladder while a person or equipment is on the ladder.
- ☐ An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.

- ☐ The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).
- ☐ A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.
- ☐ Be sure that all locks on an extension ladder are properly engaged.
- ☐ Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

E. Steel Erection

- ☐ Employees who are on a walking/working surface with an unprotected edge more than 15 feet above a lower level must be protected by conventional fall protection.
- ☐ Perimeter safety cables must be installed at the final interior and exterior perimeters of multi-story structures as soon as the decking has been installed.
- ☐ Connectors must be protected by conventional fall protection when working on a surface with an unprotected edge more than two stories or 30 feet above a lower level, and have completed the connector training.
- ☐ While working at heights over 15 and up to 30 feet, connectors must be provided with a complete personal fall arrest system or other allowable fall protection, and wear the equipment necessary for tying off.
- ☐ A controlled decking zone (CDZ) can be established as a substitute for fall protection where metal decking is initially being installed and forms the leading edge of a work area over 15 and up to 30 feet above a lower level.
- ☐ Leading-edge workers in a CDZ are required to be protected from fall hazards above 2 stories or 30 feet (whichever is less), and have completed CDZ training.
- ☐ Employees who are not engaged in leading-edge work and properly trained in the hazards involved are prohibited from entering the CDZ.

- ☐ The CDZ is required to be no more than 90 feet wide and 90 feet deep from any leading edge, not exceed 3,000 square feet of unsecured decking, have designated and clearly marked boundaries with control lines or the equivalent, have safety deck attachments placed from the leading edge back to the control line, and have at least two safety deck attachments for each metal decking panel.
- ☐ Final deck attachments and the installation of shear connectors are prohibited from being done in the CDZ.
- ☐ Guardrail systems, safety-net systems, personal fall-arrest systems, positioning-device systems and their components must conform to OSHA criteria.
- ☐ Fall-arrest system components must be used in fall-restraint systems and conform to OSHA criteria.
- ☐ Perimeter safety cables must meet the criteria for guardrail systems.
- ☐ The steel erector may leave fall protection in place so it may be used by other trades only if the controlling contractor has directed the steel erector to leave the fall protection in place, and has inspected and accepted control and responsibility of the fall protection before authorizing other trades to work in the area
- ☐ Employees who are on a walking/working surface with an unprotected edge more than **15 feet above a lower level** must be protected by conventional fall protection be protected by **conventional fall protection** when working on a surface with an unprotected edge **more than two stories or 30 feet** above a lower level have completed the **connector training** described in subpart R.
- ☐ While working at heights **over 15 and up to 30 feet**, connectors must:
- ☐ be provided with a complete personal fall arrest system or other allowable fall protection, and
- ☐ wear the equipment necessary for tying off
- ☐ Steel Erection Controlled Decking Zones DZ Fall Protection can be established as a substitute for fall protection where metal decking is initially being installed and forms the **leading edge** of a work area **over 15 and up to 30 feet** above a lower level

Leading-edge workers in a Controlled Decking Zone (CDZ)

- ☐ Workers must be protected from fall hazards **above 2 stories or 30 feet (whichever is less)**], and have **completed CDZ training** in accordance with OSHA Subpart R.

- ☐ Employees who are not engaged in leading-edge work and properly trained in the hazards involved are **prohibited from entering** the CDZ .

- ☐ The CDZ is required to:

  - ☐ Be no more than **90 feet wide and 90 feet deep** from any leading edge

  - ☐ Not exceed **3,000 square feet** of unsecured decking

  - ☐ Have designated and clearly marked **boundaries with control lines** or the equivalent.

    *Note: Control lines are commonly used as a marker because they create a highly visible boundary.

  - ☐ Have **safety deck attachments** placed from the leading edge back to the control line and

  - ☐ Have at least **two safety deck attachments** for each metal decking panel

  - ☐ **Final deck attachments** and the installation of **shear connectors** are prohibited from being done in the CDZ.

F. Guardrails.

As we have discussed above, where workers on a construction site are exposed to vertical drops of 6 feet or more, OSHA requires that employers provide fall protection. Such means of protecting workers may include using guardrails around the hazard areas, using safety nets or using other means such providing personal fall arrest systems, fall restraint systems or positioning systems for each employee.

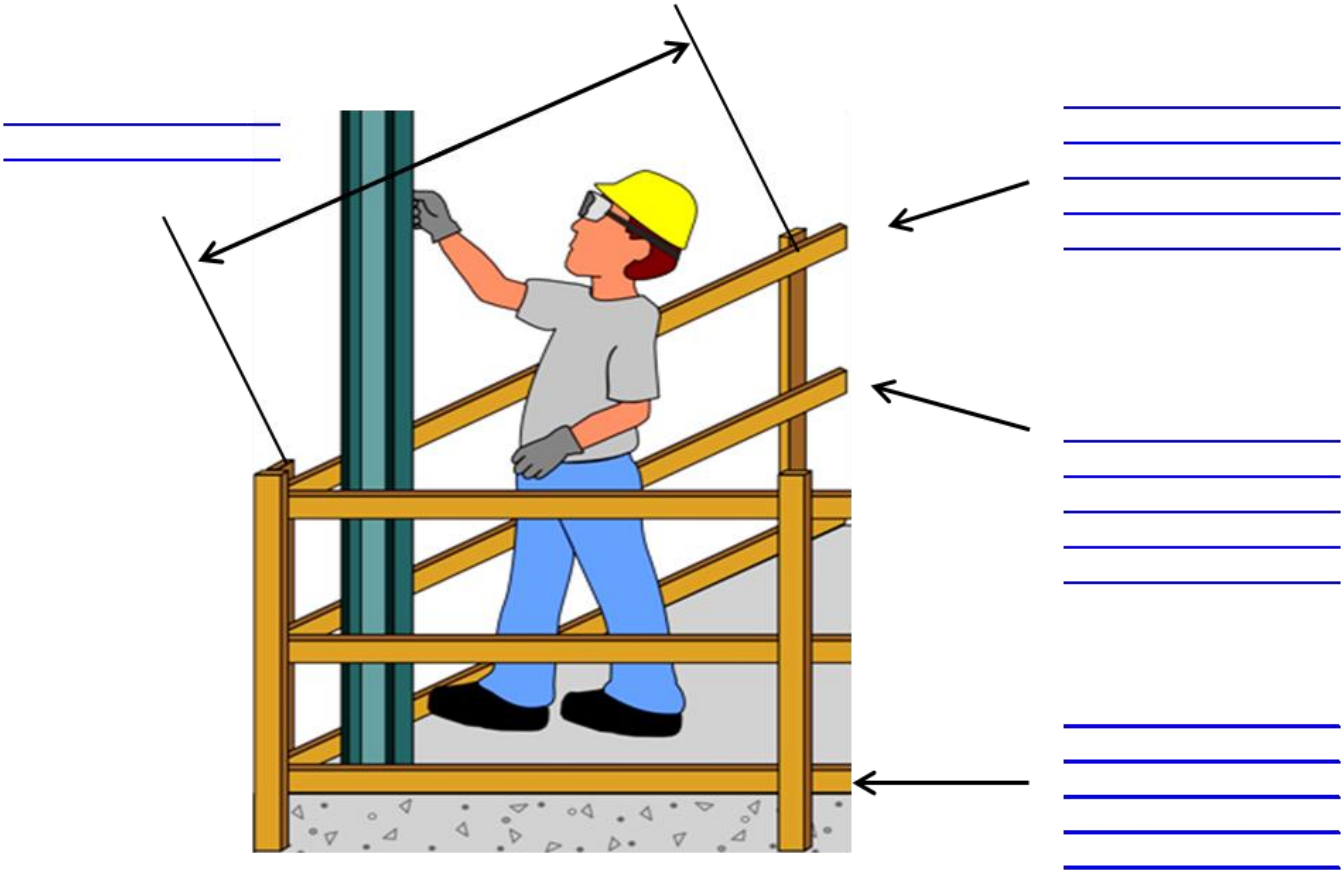
Many times the nature and location of the work will dictate the form that fall protection takes. If the employers choose to use a guardrail systems, they must comply with the following provisions:

- ☐ Top edge height of top rails, or equivalent guardrail system members, must be between 39 and 45 inches above the walking/working level, except when conditions warrant otherwise and all other criteria are met (e.g., when employees are using stilts, the top edge height of the top rail must be increased by an amount equal the height of the stilts).
- ☐ Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structures, must be installed between the top edge and the walking/working surface when there is no wall or other structure at least 21 inches high.
- ☐ Midrails must be midway between the top edge of the guardrail system and the walking/working level.
- ☐ Screens and mesh must extend from the top rail to the walking/working level, and along the entire opening between rail supports.
- ☐ Intermediate members (such as balasters) between posts must be no more than 19 inches apart.
- ☐ Other structural members (such as additional midrails or architectural panels) must be installed so as to leave no openings wider than 19 inches.
- ☐ Guardrail systems must be capable of withstanding at least 200 pounds of force applied within 2 inches of the top edge, in any direction and at any point along the edge, and without causing the top edge of the guardrail to deflect downward to a height less than 39 inches above the walking/working level.
- ☐ If guardrail systems or portions thereof, are removed to facilitate a hoisting operation, and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system.

- ☐ Midrails, screens, mesh, and other intermediate members must be capable of withstanding at least 150 pounds of force applied in any direction at any point along the midrail or other member.
- ☐ Guardrail systems must not have rough or jagged surfaces that would cause punctures, lacerations, or snagged clothing.
- ☐ Top rails and midrails must not cause a projection hazard by overhanging the terminal posts.

Exercise: Guardrails

Can you identify and provide some important information regarding the proper use and installation guardrail systems.

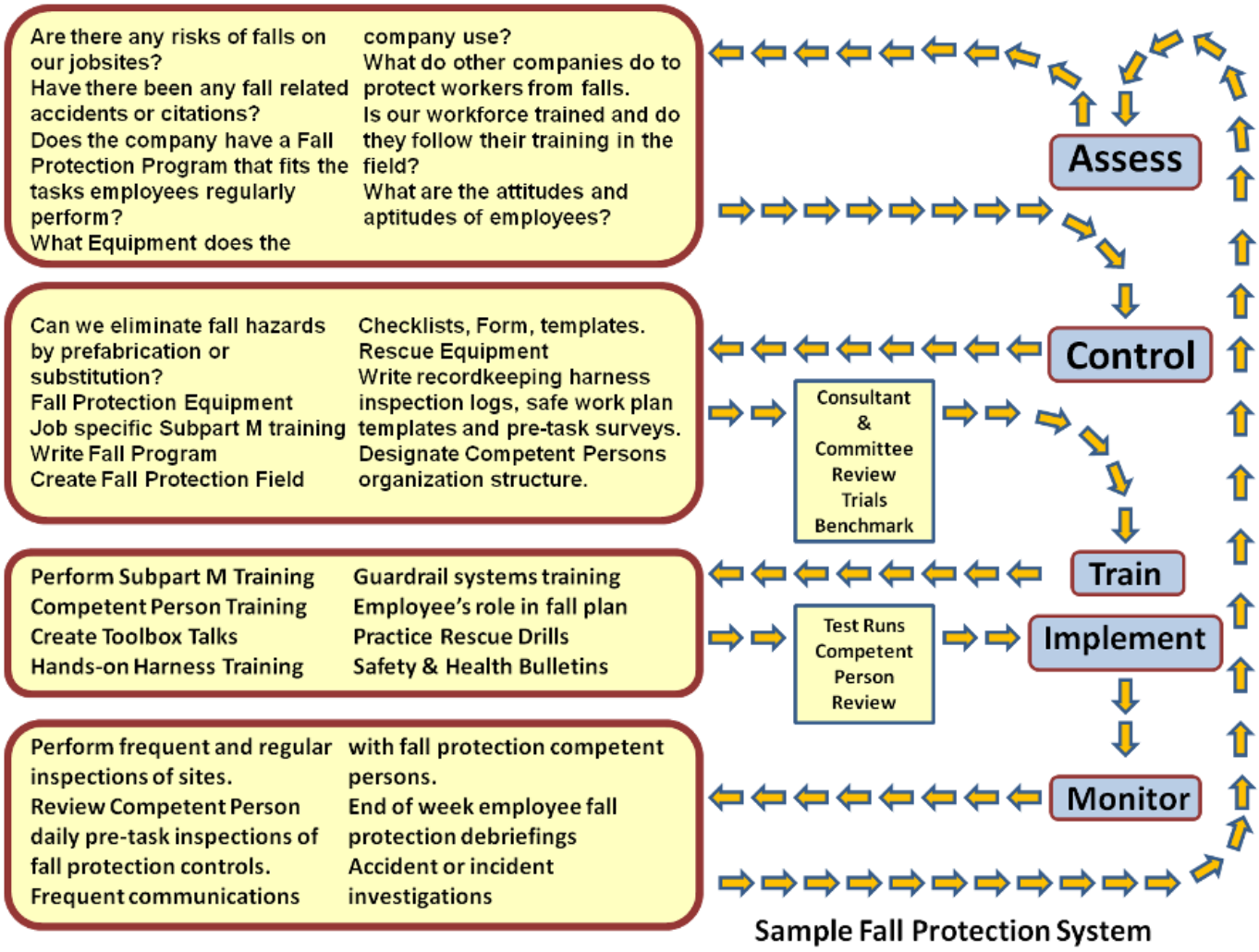


Section Four: Debriefing Workshop

As is proper with any type of training or education, there should be a means of evaluating the experience and assessing its effectiveness. Let us take a few moments and talk about what this program has achieved and where it can be made better. Also, let's take notes so we can look back on our notes say in the months to come and see if, at all, has this training and what we accomplished today had some longer-term effect on our workplace.

Notes:

Appendix A: A model Fall Protection System Flow Chart



(Source: University Medicine and Dentistry of New Jersey: 2010 OSHA Susan Harwood Grant: Systems of Safety Applied to Focus Four Hazard Categories)

Appendix B: Questionnaire Example

Please take a few minutes to complete this survey. Your specific answers will be completely anonymous, but your views, in combination with those of others, are extremely important.

1. Overall, how satisfied are you with working here? (Please circle one number)

Very Dissatisfied				Very Satisfied
1	2	3	4	5

2. Prevention (Please circle one number for each statement)

	Disagree Strongly			Agree Strongly
I have received the proper safety training for my job	1	2	3	4
I understand all the safety rules and regulations related to my job	1	2	3	4
Employee safety is a top concern of company management	1	2	3	4
Unsafe conditions are fixed in a timely manner	1	2	3	4

3. Reporting and Monitoring (Please circle one number for each statement)

I feel confident any safety concerns I raise will be addressed	1	2	3	4
If I refused to work when I felt I would put myself in danger, I would not get into trouble	1	2	3	4
If I reported an unsafe condition to management, I would not get into trouble	1	2	3	4

4. General Working Conditions (Please circle one number for each statement)

The equipment I work with is in safe working order	1	2	3	4

There are no electrical hazards in my immediate work area 1 2 3 4

Other employees around me always act in a safe manner 1 2 3 4

5. **Company Location** (Please circle one number for each statement)

I work in Department A B C D

I work on Day Shift Evening Shift Night Shift

Appendix C: Abbreviations

ANSI	American National Standards Institute
CIH	Certified Industrial Hygienist (See http://www.abih.org for more information)
CDZ	Controlled Decking Zones
CSP	Certified Safety Professional (See http://www.bcsp.org for more information)
HASP	Health & Safety Plan
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
MOC	Management of Change
OPHP	Office of Public Health Practice
OSHA	Occupational Safety & Health Act or Administration
PFAS	Personal Fall Arrest System
PPE	Personal Protective Equipment
SPH	School of Public Health
UMDNJ	University of Medicine & Dentistry of New Jersey
VPP	Voluntary Protection Program