

FALL PROTECTION PLAN

CPWR – The Center for Construction Research and Training created this document as part of the National Campaign to Prevent Falls in Construction to provide companies with guidance on how to develop or enhance their site-specific fall protection plans. While OSHA only requires a written fall protection plan for employees engaged in leading edge work, precast concrete erection work, or residential construction work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment (See 1926.501(b)(2), (b)(12), and (b)(13)), CPWR believes that developing and implementing a detailed fall protection plan is essential to protect all workers at risk for a fall. We encourage you to use any and all sections that are applicable to your jobsite(s).

Note: blue text indicates that a word can be found in the glossary at the end of this packet.

For more information about the National Campaign to Prevent Falls in Construction, including how to participate in the annual Safety Stand-Down, visit stopconstructionfalls.com.

Job Name: _____

Jobsite Phone: _____

Job Address: _____

Job Foreman: _____

Qualified Person: _____

1. JOBSITE/BUILDING DETAILS

Use the following page to sketch and note the important details of the jobsite. Be sure to consider:

- Type of jobsite or building (e.g. two-story residential home, commercial high-rise, highway work)
- Type of work being done (e.g. framing, roofing, electrical, restoration)
- [Prevention through Design](#) measures already in place (e.g. permanent railings or permanent ladders)
- Relevant work surfaces & building materials (e.g. abrasive concrete edges, slippery floors)
- Estimated duration of job (should you consider longer-term solutions such as scaffolding vs. moveable lifts?)



2. FALL HAZARDS IN THE WORK AREA

In the construction sector OSHA requires fall protection for workers at heights of 6' or more above the ground or a lower level, but slips, trips, and falls can occur at any height. In order to make this plan comprehensive and useful to everyone interested in providing a safer work environment for their employees, we have included these hazards as well.

Check all that apply. Add others in the empty rows if necessary. Include locations and dimensions next to each hazard, and/or note these hazards on your drawing above.

| ✓ | Hazard | Location | Dimensions/Details |
|---|--|----------|--------------------|
| | Open-sided walking/working surfaces (i.e. roofs, open-sided floors) | | |
| | Open-sided ramps, runways, platforms | | |
| | Leading Edge(s) | | |
| | Floor openings | | |
| | Wall or window openings | | |
| | Skylight openings | | |
| | Elevator shaft | | |
| | Stairwell | | |
| | Trenches | | |
| | Uneven surfaces or surfaces that do not meet the definition of a walking/working surface | | |
| | Other: | | |
| | | | |

3. ACCESS EQUIPMENT BEING USED

This section provides space to identify the access equipment that will be used to allow workers to reach the heights necessary to conduct work (fall arrest, fall restraint, and fall protection equipment is covered in section 4). When selecting access equipment, it is important to use the right equipment for the work being performed. You may also want to consider how access equipment may be used for rescue in the event of a fall (see section 8). Add other equipment to the empty rows if necessary.

| ✓ | Access Equipment | Location | Dimensions/Details | Load Capacity |
|---|-------------------------------|----------|--------------------|---------------|
| | Scaffolding | | | |
| | Mast Climbing Scaffold(s) | | | |
| | Aerial Lift(s) | | | |
| | Scissor Lift(s) | | | |
| | Boom Lift(s) | | | |
| | Push Around Vertical/ Vehicle | | | |
| | Extension Ladder(s) | | | |
| | Step Ladder (s) | | | |
| | Fixed Ladder (s) | | | |
| | Other: | | | |
| | | | | |



Limitations to Access Equipment: Each type of equipment has different advantages and disadvantages. For example, while ladders may provide quick and easy access, there is a high rate of injury just from climbing up and down, and in some cases a scaffold or lift may be safer. A **competent person** should carefully review all existing **fall hazards** and work activities, along with safe use requirements and product limitations, to ensure the best equipment is selected. List any possible limitations to the equipment you've selected and steps to address them below:

| Access Equipment | Limitation(s) | Steps to Address Limitation(s) |
|------------------|---------------|--------------------------------|
| | | |
| | | |
| | | |
| | | |

Assembly, Maintenance, Inspection, Disassembly Procedures:

Assembly and disassembly of all access equipment should be done according to manufacturers' recommendations. Copies of manufacturer's specifications should be included in your plan for each type of equipment used. Pre-job checks should be conducted daily. Any defective equipment should be **tagged** and removed from use immediately. Manufacturer recommendations for maintenance and inspection should be followed.

Use the following table to describe procedures for **assembly, maintenance, inspection, and disassembly** of access equipment to be used. Be sure to note the name of the qualified person responsible.

| Access Equipment | Assembly & Disassembly | Maintenance & Inspection | Qualified Person |
|------------------|------------------------|--------------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

4. METHOD OF FALL ARREST OR FALL RESTRAINT

When selecting appropriate **personal fall arrest** or **fall restraint systems**, refer back to the sections above to consider factors such as building material, height of work, and specific hazards such as **leading edges**. **Fall arrest** systems work by stopping a **free fall** after the fall occurs. **Fall restraint** systems work by preventing the fall from happening after a slip or trip. It is important not only to select the appropriate systems, but to ensure that the category of equipment and materials used to construct each piece in the system are sufficient to mitigate the hazards. It is also important to consider the fall clearance distance needed – for both height and swing clearance (see infographic below; actual totals will be based on the characteristics of each worker and the equipment selected).

Check all that apply. Add other methods in blank rows if necessary. Write details such as manufacturer or location of **anchorage** points next to equipment when relevant.



| ✓ Method of Fall Arrest or Restraint | Load Capacity | Other Details |
|--------------------------------------|---------------|---------------|
| Full Body Harness | | |
| Body Belt | | |
| Positioning Lanyard | | |
| Self-Retracting Lifeline (SRL) | | |
| Lifeline | | |
| Travel Restraint Line | | |
| Horizontal Lifeline | | |
| Rope Grab | | |
| Deceleration Device | | |
| Shock Absorbing Lanyard | | |
| Locking Snap Hooks | | |
| Safety Nets | | |
| Guard Rails | | |
| Warning Lines | | |
| Safety Monitor | | |
| Name of Monitor if used: | | |
| Toeboards | | |
| Slideguards | | |
| Other: | | |
| | | |

THE RIGHT LENGTH LANYARD WILL PROTECT WORKERS IN A FALL
Employers, do the math. Example Below.

BEFORE FALL **MID-FALL (Pre-Harness Elongation[†])** **AFTER FALL**

ANCHOR POINT

- 6 ft* Length of Lanyard
- 3.5 ft* Deceleration Distance
- 1 ft* Harness Elongation[†]
- 5 ft* D-Ring to Bottom of Feet
- 2 ft Safety Factor

17.5 ft Total Clearance Distance From Anchor

Learn more at: <https://bit.ly/2FPD3M6>

Watch for swing hazards

*Will vary based on equipment and worker
[†]Also known as D-ring shift

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Workplace Safety and Health THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

Source: U.S. Department of Labor, Occupational Safety and Health Administration. OSHA Technical Manual: Fall Protection in Construction. Section V: Chapter 4. https://www.osha.gov/dts/osta/otm/otm_v/otm_v_4.html#calculating.

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Limitations to Fall Arrest/Restraint Equipment: Are there any potential limitations to the system(s) selected? For example, if the length of a lanyard constantly needs to be adjusted, you may determine that an SRL is the better choice. A competent person should carefully review all existing fall hazards and work activities, along with safe use requirements and product limitations, to ensure that the best fall protection system is selected. List any potential limitations and steps to address them here:

| Fall Arrest/Restraint Equipment | Limitation(s) | Steps to Address Limitation(s) |
|---------------------------------|---------------|--------------------------------|
| | | |
| | | |
| | | |
| | | |

Assembly, Maintenance, Inspection, Disassembly Procedures:

Assembly and disassembly of all fall arrest/restraint equipment should be done according to manufacturers’ recommendations. Copies of manufacturer’s specifications should be included in your plan for each type of equipment used. OSHA states that personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration. Any defective equipment or components should be tagged and removed from service immediately. Manufacturer recommendations for maintenance and inspection should be followed. A generic fall protection equipment inspection checklist can be accessed at <http://stopconstructionfalls.com/wp-content/uploads/2014/04/Fall-Protection-Equipment-Inspection-Form.pdf>.

Use the following table to describe procedures for assembly, maintenance, inspection, and disassembly of fall protection systems to be used. Be sure to note the name of the qualified person responsible.

| Fall Arrest/Restraint Equipment | Assembly & Disassembly | Maintenance & Inspection | Qualified Person |
|---------------------------------|------------------------|--------------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

5. OTHER MITIGATION OF FALL HAZARDS

Depending on the fall hazards you checked in Section 2, additional safety measures may be needed. For example: installing substantial covers over skylights, posting signs alerting workers to floor openings or other dangers, or instituting good housekeeping measures to keep floors and work surfaces clean and clear of debris that could contribute to slips and trips. Describe additional fall hazard mitigation plans here and/or mark them on your drawing:



6. PROTECTION OF NEARBY WORKERS

Handling, Storage, & Securing of Tools and Material

Steps should be taken to prevent tools and materials being used at heights from falling to lower levels.

Toeboards or slideguards can be installed on roofs and scaffolding at a height that will prevent tools from sliding over the edge or down the slope. Lanyards may be used to avoid dropped tools. Describe plans for handling, storage and securing:

Overhead Protection

Hardhats are required on all jobsites with the exception of those that have no exposure to overhead hazards. Warning signs should be posted to caution of overhead hazards whenever present. Conditions may warrant additional protection, such as the use of debris nets. Describe planned overhead protection:

7. RESCUE PLAN(S)

Even when all steps are taken to prevent them, falls can still occur. If a worker falls, you should call 911 immediately, but because time is sensitive when a worker is hanging in a harness susceptible to suspension trauma (see infographic below), it is crucial to be prepared by having a detailed rescue plan. OSHA mandates that an employer provide for prompt rescue of employees or ensure that employees are able to rescue themselves. If a worker is not injured after a fall, self-rescue through devices with descent capability may be the best option. However, because some rescue situations are more complicated and injuries preventing self-rescue do occur, it is important for employers to ensure availability of trained rescue personnel and ladders, lifts, or other rescue equipment. Once the worker is moved to a safe area, a certified individual should perform normal first aid procedures. Even if you are able to rescue the worker and they don't seem injured, they should be examined by a medical professional.



HAVE A RESCUE PLAN TO PREVENT SUSPENSION TRAUMA

The harness stopped the fall, but hanging too long can be deadly!



Before work begins...

- ✓ Train workers on self and assisted rescues, and provide rescue equipment.

After a fall, initiate the rescue plan...

- ✓ If immediate rescue is not possible, the suspended worker should keep blood circulating by:
 - Using trauma straps or loops, a personal rope ladder, or create a foot loop from the lifeline to shift into a standing position.
 - "Pumping" legs frequently.
- ✓ Call 911. Do not let the worker lie down while waiting for help.

Watch the Clock... if blood is not circulating, it only takes a short time for a worker to:



Become light-headed, nauseous, or unconscious



Suffer suspension trauma and death

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Learn more at www.osha.gov/dts/shib/shib032404.pdf



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Sources: (1.) U.S Department of Labor, Occupational Safety and Health Administration. Orig. 2004, Updated 2011. *Safety and Health Information Bulletin: Suspension Trauma/ Orthostatic Intolerance.* <https://www.osha.gov/dts/shib/shib032404.pdf>. (2.) Weems, B. 2003. *Will Your Safety Harness Kill You?* Information originally published in Occupational Health & Safety Magazine, accessed from eLCOSH: <http://elcosh.org/document/1662/d000668/will-your-safety-harness-kill-you%3F.html>.

Phone Location: _____

First Aid Location: _____

Individual(s) Qualified to Provide First Aid: _____

Rescue Equipment Provided: _____

Location of Rescue Equipment: _____

Authorized (Trained) Rescuer: _____

Methods to be used for the removal of injured worker(s): _____

Additional Information: _____

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8. WORKER TRAINING & INSTRUCTION

All new employees should be trained on the proper use of equipment and fall protection devices before they begin work, and seasoned workers should be provided with regular refresher training. This fall protection plan should be part of the training/refreshers. It should be reviewed with all employees before work begins on the jobsite. Fall protection equipment use should be reviewed regularly at safety meetings. For Toolbox Talks, videos, and other training resources, visit <https://stopconstructionfalls.com/prevent-falls-training-other-resources/>.

Describe your training plan: _____

On the following sheet, list employees who received training on the above site-specific fall protection work plan, along with the date the training was received.

Any changes to this plan should be made by the **qualified person. This plan should be reviewed periodically by the qualified person as the job progresses to determine if changes or additional protection or training is needed. In the event of any incident resulting in an injury or near miss, this plan should be reviewed to determine if changes or additional protection or training is needed to prevent similar incidents in the future.**



GLOSSARY

Anchorage^{1,2} - A secure point of attachment for a personal fall arrest, fall restraint, or rescue system that can safely withstand the forces each of these systems requires. Should be installed and used under supervision of a qualified person and capable of supporting at least 5,000 pounds.

Authorized Rescuer - An employee who has been trained to perform or assist with rescues. Depending on the type and difficulty of rescue needed, it is recommended that the employee undergo at least 40 hours of specific training.

Body Belt¹ - A strap with means both for securing about the waist and for attaching to other components such as a lanyard used with positioning systems, travel restraint systems, or ladder safety systems. Used for work positioning and/or fall restraint.

Carabiner¹ - A connector generally comprised of a trapezoidal or oval shaped body with a closed gate or similar arrangement that may be opened to attach another object and, when released, automatically closes to retain the object.

Connector¹ - A device used to couple (connect) parts of the fall protection system together.

Competent person^{1,3} - A person who is capable of identifying existing and predictable hazards in a work environment, equipment, personal fall protection system or specific components of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.

D-ring¹ - A connector used in a harness as an integral attachment element or fall arrest attachment; in a lanyard, energy absorber, lifeline, or anchorage connector as an integral connector; or in a positioning or travel restraint system as an attachment element.

Deceleration Device¹ - Any mechanism that serves to dissipate energy during a fall. Deceleration devices include rope grabs, some lanyards and self-retracting lifelines.

Deceleration Distance¹ - The vertical distance a falling worker travels from the point at which the deceleration device begins to operate, excluding lifeline elongation and free fall distance, until stopping. It is measured as the distance between the location of a worker's body harness attachment point at the moment of activation of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop. See infographic in section 4.

Fall Arrest - The act of stopping a free-fall. Occurs after a fall has taken place.

Fall Clearance² - The vertical distance needed to safely arrest a fall. See infographic in section 4 for clearance calculation.

Fall Hazard - Any location where an employee is exposed to a potential fall.

Fall Restraint - The act of stopping a fall by preventing the fall from occurring. A fall restraint system is a system that prevents the worker from falling.

Free Fall¹ - The period of time between when a worker begins to fall and when the personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance¹ - The vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, lifeline and lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the devices operate and fall arrest forces occur. See infographic in section 4.



Full-Body Harness¹ - straps that secure about the worker in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with a means for attaching the harness to other components of a personal fall protection system.

Guardrail^{2,4} - A barrier installed to prevent workers from falling off a work surface edge to a lower level. Consists of horizontal top- and mid-rails placed against vertical supports and toeboards when necessary to protect workers below from falling objects. Guardrails should have the strength to withstand at least 200 pounds applied within 2 inches of the top edge in any outward or downward direction.

Horizontal Lifeline/Horizontal Lifeline Systems² - Consists of a flexible line for connection to anchorages at both ends, which stretches horizontally and serves as a means for connecting other components of a personal fall arrest system to the anchorage. Can be temporary or permanent. Requires special attention during design and installation to: (1) limit the distance the worker can fall (a greater sag in the line can mean a farther fall); and (2) minimize the forces on the connectors at the anchorage (a greater sag in the line can mean lower forces on the anchorage connectors at either end). A qualified person must supervise the horizontal lifeline's design, installation, and use (see 29 CFR 1926.502(d)(8)).

Lanyard¹ - A flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

Leading Edge³ - The unprotected side and edge of a floor, roof, or formwork for a floor or other surface (such as deck) which advances/changes location as additional sections are placed, formed or constructed. Creates a fall hazard for workers working on the structure.

Lifeline^{1,2} - A component of a personal fall protection system consisting of a flexible line for connection to an anchorage at one end so as to hang vertically (vertical lifeline), or for connection to anchorages at both ends so as to stretch horizontally (horizontal lifeline), and serves as a means for connecting other components of the system to the anchorage.

Locking Snap Hooks (Snap Hooks)¹ - Self-closing/self-locking connectors that provide an eye for attachment of a lifeline or lanyard.

Personal Fall Arrest System (PFAS)¹ - The complete collection of equipment and components designed to stop a fall in progress; consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal Fall Protection System¹ - A system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Positioning system (work-positioning system)¹ - A system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free.

Prevention through Design (PtD) - Also known as Design for Safety, this concept involves taking key steps to minimize occupational hazards early in the design process. Can include design of the structure, jobsite, work methods and operations, equipment, organization of work, etc.

Qualified Person^{1,2} - A person who supervises the design, installation and inspection of fall protection and rescue systems. This person must possess a recognized degree, certificate or professional standing, or by extensive knowledge, training and experience have successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work or the project.

Rescue System - Equipment and components used to help a fallen worker return to the ground or location from which he or she fell, or that retrieves or evacuates an employee from dangerous situations.



Rope Grab¹ - A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/lever locking, or both.

Safety Factor² - Additional distance added to the total fall clearance distance to ensure there is enough clearance between the worker and the lower level after a fall. It is typically 2 feet.

Safety Monitor² - A competent person responsible for recognizing and warning employees of fall hazards.

Safety Net² - Refers to net systems either for fall arrest, which can withstand fall arrest forces, or for debris containment, protecting workers below from falling objects.

Self-retracting Lifeline (SRL)¹ - A deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Shock-Absorbing Lanyard² - A connective device used with a personal fall arrest system that features an integral shock absorber, typically made of webbing designed to stretch as it receives the worker's falling weight, dissipating the energy of a fall and breaking the fall in a controlled manner.

Shock Absorber - Also known as an energy absorber. A unit that will dampen the energy or force exerted on the worker during a fall.

Slideguard - a roof jack with a minimum 2ft x 6ft plank installed on a steep slope roof as a substantial foothold to keep workers who slip or trip from continuing to fall.

Suspension Trauma² - A condition that occurs when the leg straps of a full-body harness combined with the body's position following fall arrest constrict the veins, causing blood to pool in the legs. Can lead to severe complications or death (see infographic in section 8).

Suspension Trauma Straps or Loops - A device that can be attached to or is included in a full-body harness that is deployed following fall arrest and allows the worker to step up into a standing position, relieving pressure and minimizing the impact of suspension trauma (see infographic in section 8).

Tag - A piece of material attached to one end of something as a label or mark. Should be used on equipment that is damaged or defective and has not yet been removed from the site to indicate it is not safe to use.

Toeboard⁴ - A barrier attached to a guard rail system to prevent tools and dropped objects from falling over the edge. According to OSHA, a toeboard shall be at least 3½ inches in height from top edge to floor level, and be capable of withstanding a force of 50 pounds applied in any direction. Drainage clearance under toeboards is permitted.

Travel Restraint System¹ - a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Travel Restraint Line¹ - A rope or wire rope used to transfer forces from a body support to an anchorage or anchorage connector in a travel restraint system. Must be capable of sustaining a tensile load of at least 5,000 pounds.

Vertical Lifeline² - a flexible line connecting to an anchorage at one end and hanging vertically to serve as a means for connecting other components of a personal fall arrest system to the anchorage, allowing the worker to move up and down. Vertical lifelines require active participation by the worker, who must often reposition the rope grab when moving to a new position and remain connected to a set anchorage point while the lanyard moves with the worker. When vertical lifelines are used each worker generally needs to be attached to a separate lifeline (see 29 CFR 1926.502(d)(10)).



Warning Lines² - Ropes, wires, or chains marking an unprotected edge, hole or other fall hazard; used either in conjunction with or in lieu of conventional fall protection. Warning lines are not engineered to physically prevent or arrest falls and may not be used in all situations. On flat or low-sloped roofs, warning lines may be used in conjunction with conventional fall protection or a safety monitoring system (see 29 CFR 1926.501(b)(10)). Workers are not allowed in the area between the warning line and the unprotected edge, except during roofing work (see 29 CFR 1926.502(f)(3)). Any employee performing roofing work between the warning line and the roof edge must be protected using another form of fall protection. In all other situations, OSHA has stated that a warning line system should be set 15 feet from an unprotected edge to protect employees engaged in non-roofing activities inside of the line. Warning lines must be set up in accordance with OSHA standard 1926.502(f)(2).

May also refer to rope marking off an area below overhead work so that workers on the ground do not enter the area.

Webbing - Woven fabric used on fall protection equipment components such as full-body harnesses and lanyards.

Sources:

1. OSHA Standard 1910.140: Personal Protective Equipment: Personal Fall Arrest Systems: Definitions. <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.140>.
2. OSHA Section V: Chapter 4, Fall Protection in Construction. https://www.osha.gov/dts/osta/otm/otm_v/otm_v_4.html.
3. OSHA Standard 1926.751: Safety and Health Regulations for Construction: Steel Erection: Definitions. <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.751>
4. OSHA Standard 1910.29: Walking-Working Surfaces: Fall protection systems and falling object protection-criteria and practices. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9721&p_table=STANDARDS.

