

OSHA[®] FactSheet

Reducing Falls During Residential Construction: Roof Sheathing

After a roof has been framed, workers can begin installing roof sheathing. Because this work often occurs at great heights, it involves serious fall hazards. This risk makes it important that fall protection systems be used properly during these activities. This fact sheet highlights some of the hazards associated with installing roof sheathing and lists some practical methods that employers may be able to use to protect workers. The fall protection methods in this fact sheet may not be suitable in all situations. Employers are responsible for ensuring compliance with applicable OSHA requirements.

Risks While Installing Roof Sheathing

Workers installing roof sheathing risk permanent injury or death from falls. Even experienced workers are exposed to unpredictable fall hazards caused by uneven sheathing, sudden gusts of wind, loose materials, and surfaces that become slick when wet. Taking appropriate fall protection measures reduces risks and saves lives.

The employer must provide a training program for each worker who might be exposed to fall hazards. The program must enable each worker to recognize the hazards of falling and train each worker in the procedures to follow to minimize these hazards. For fall protection training requirements, refer to 29 CFR 1926.503. In all cases, employers must evaluate the hazards and take measures to reduce the risk of falls.

More than one-third of fall deaths in residential construction are caused by falls from roofs.

Roof Sheathing Safely: Important Steps

Pre-planning for the use of fall protection equipment can help employers protect workers from falls. Before beginning the job, focus on identifying fall protection needs. Plan ahead and identify those systems needed to protect workers from falls and have them available before sheathing begins.

Reducing Risks

Workers' risk of falling can be greatly reduced if sheathing is installed onto truss sections while

the truss sections are on the ground. The truss sections can then be hoisted into place. Peak anchors and lifelines can be pre-installed before the sections are lifted onto the frame. Scaffolds, ladders and lifts can provide workers stable walking/working platforms to stand on to secure the pre-fabricated truss section to the building frame.

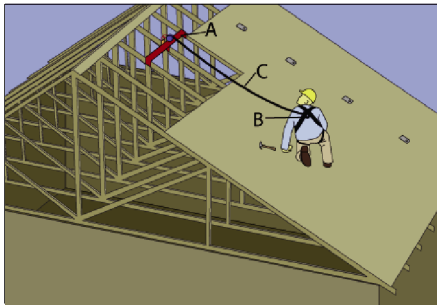
When installing roof sheathing in elevated locations, employers should be aware that roof structures generally are unstable until they are properly braced according to industry standards or some sheathing is in place. If conventional fall protection cannot be used due to unstable conditions, employers should consider using ladders, scaffolds or aerial lifts until the first row of sheathing has been installed and until a qualified person, as defined by 29 CFR 1926.32(m), determines that the roof can be used as an anchorage point for a personal fall arrest system. A qualified person can be the owner, the supervisor, or any other worker who has extensive knowledge, training and experience with fall protection and is able to solve problems relating to fall protection.

Personal Fall Arrest System (PFAS): A PFAS is a tool available to workers during roof sheathing jobs. In fact, a PFAS is the system of choice for many workers at heights. However, a breakdown in any component of a PFAS could be disastrous for a worker. Always follow the manufacturer's instructions on selecting, installing and using PFAS components correctly.

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:

- A. An **anchorage** to which the other components of the PFAS are rigged.
- B. A full body **harness** worn by the worker.
- C. 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.



For more information on the requirements for a PFAS, refer to 29 CFR 1926.502(d).

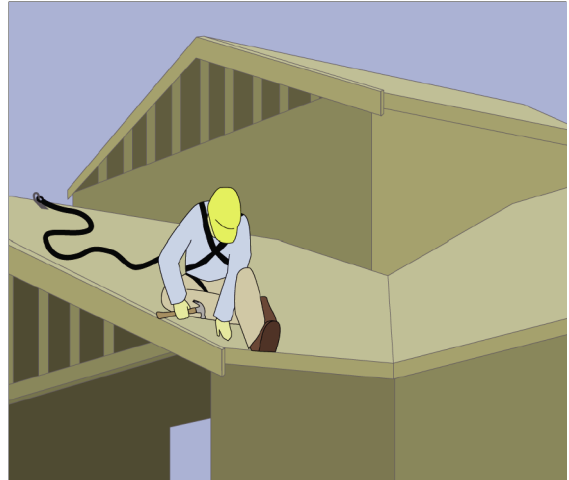
Remember that workers must use full-body harnesses in fall arrest systems. Body belts can cause serious injury during a fall, and OSHA prohibits their use as part of fall arrest systems.

Numerous employers have found that for most roofs, a PFAS can be used once the proper bracing and/or an appropriate amount of sheathing has been established. Anchor points established during truss erection can prove useful during roof sheathing. When placing sheathing on trusses, workers should keep sheathing in front of them as a barrier to protect themselves from falling between truss openings. Once in place, the sheathing can be tacked and nailed down to prevent movement and reduce fall exposures to the inside of the building.

Fall Restraint: While fall restraint systems are not mentioned in OSHA's fall protection rules, OSHA will accept a properly utilized fall restraint system in lieu of a personal fall arrest system when the restraint system is rigged so that the worker cannot get to the fall hazard. In effect, (if properly used) the system tethers a worker in a manner that will not allow a fall of any distance. A fall restraint system is comprised of a body belt or body harness, an anchorage, connectors, and other necessary equipment. Other components

typically include a lanyard, and may also include a lifeline and other devices.

Always follow the manufacturer's instructions or consult a qualified person to ensure proper installation of anchor points. Fall restraint may be a viable way to provide fall protection in situations in which the employer has concerns about the adequacy of available anchorage points for fall arrest equipment.



Attaching Anchors

OSHA requires that anchors for PFAS be able to hold at least 5,000 pounds of weight per person, or maintain a safety factor of at least two (twice the impact load) under the supervision of a qualified person. Always follow the anchor manufacturer's instructions or consult a qualified person when installing anchors to ensure they are strong enough to hold the sudden weight of a falling worker. OSHA believes that anchorages available on the market will meet the strength requirements if they are installed as per the manufacturer's instructions, with the right number of properly sized nails or screws through the roof sheathing and into one or more roof trusses.

When choosing an anchor to use for fall protection, employers have a number of options; for example,

- **Peak anchor:** At the top of the roof, peak anchors are typically solid, non-moving pieces secured to the trusses underneath.
- **Permanent D-rings:** Inexpensive D-ring anchors are attached to the truss frame; they can be left permanently on the roof for future use.

Spreader: Employers may be able to use engineered spreaders as anchor points. When installed in accord with the manufacturer's

instructions, these devices distribute the force of a PFAS across multiple trusses. The roof trusses do not need to be sheathed to use a spreader. These engineered anchorage devices are reusable and can be uninstalled and reinstalled quickly. **A qualified person should decide if the spreader is suitable for use as an anchor.**

Install an anchor above the area being built:

Choose an anchor that is appropriate for the type of roof and anchor location. Depending on the roof design, the best location might be at the peak of the roof, directly over a truss.

Consider leaving anchors in place: Where practical, employers may consider leaving anchors in place. This can make the current job simpler and reduce the burden for roofers in the future.



Scaffolding: Workers installing roof sheathing may be able to use scaffold systems. Bracket scaffolding systems, including top-plate scaffolding systems, can provide workers with stable work platforms. Workers may be able to install the bottom row of roof sheathing while they are standing on these scaffold systems and leaning over the

sheathing. Always follow the manufacturer's instructions or consult a qualified person to ensure proper scaffold assembly and use. For requirements on scaffolds, refer to 29 CFR 1926 Subpart L - Scaffolds.

Ladders (A-frame and platform): If the floor below has been established, A-frame and platform ladders can provide stable work platforms for workers who are installing the first row of sheathing on a roof. Always ensure that a ladder has good footing before mounting it. Consult 29 CFR 1926 Subpart X, Ladders for ladder safety requirements.

Safety net systems: In some situations, safety nets can be placed underneath unsheathed trusses to prevent workers from falling between the trusses to the level below. Safety nets must be installed to prevent contact with the surface or structures below them. For requirements for safety nets, refer to 29 CFR 1926.502(c)-Safety Net Systems.

Staging Material

Loose material and hand-held equipment can create tripping hazards on the roof surface. To

minimize exposure to fall hazards, employers can stage materials so that workers on the roof have quick and safe access to them. While handling material on the roof, the worker should hold the material on the side of his or her body that faces the down-sloped edge to prevent being struck by the materials if they are dropped. Material can also be staged so it cannot slide off the roof edge and potentially strike a worker on the ground. Slide guards can help to keep material from sliding off the roof. Establishing a restricted area around the perimeter of the project can also keep workers out of the danger zone where debris, tools or materials may fall to the ground. The area should be posted with signs that warn of the potential hazard.

Other considerations: Some employers have found success in eliminating fall hazards by using scaffolds and aerial lifts when site conditions permit their use. Fall protection requirements performed on scaffolds and aerial lifts can be found in Subpart L – Scaffolds.

Written Fall Protection Plans

When working at heights of six feet or greater, if the employer does not use ladders, scaffolds, aerial lifts or fall restraint systems and can demonstrate that it is not feasible or would create a greater hazard to use conventional fall protection equipment (guardrails, safety nets or PFAS), the employer must develop a written site-specific fall protection plan in accord with 29 CFR 1926.502(k). The plan must be prepared by a qualified person. This person could be the owner, the supervisor, or any other worker who has extensive knowledge, training and experience with fall protection and is able to solve problems relating to fall protection.

The site-specific fall protection plan must document, for each location, why the use of conventional fall protection equipment is not feasible or will create a greater hazard. The plan must also describe the alternative methods that the employer will use so that workers are protected from falls. Workers and their supervisors must be trained on the proper use of those other fall protection methods.

Conventional fall protection equipment can reduce or eliminate the chances of a fatal fall. Otherwise, a written site-specific fall protection plan ensures that protection continues, even when conventional fall protection methods are determined to not be feasible.

OSHA Standard:**29 CFR 1926 Subpart M – Fall Protection**

Available online at

www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10922.

OSHA Residential Fall Protection Web Page:

www.osha.gov/doc/topics/residentialprotection/index.html.

OSHA Compliance Guidance:**Compliance Guidance for Residential****Construction – STD 03-11-002 (dated 12/16/2010)**

Available online at

www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=4755.

State Plan Guidance: States with OSHA-approved state plans may have additional requirements for Residential Roofing. For more information on these requirements, please visit: www.osha.gov/dcsp/osp/statestandards.html.

Help for Employers: OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards and assist in establishing injury and illness prevention programs. To locate the OSHA Consultation Program nearest you, call 1-800-321-OSHA (6742) or visit www.osha.gov/dcsp/smallbusiness/index.html.

Almost every OSHA area office has a Compliance Assistance Specialist to assist employers in complying with OSHA standards. To find the Compliance Assistance Specialist nearest you, call 1-800-321-OSHA (6742) or visit: www.osha.gov/html/RAmap.html.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.



U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

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