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OSHA[®] FactSheet

Reducing Falls During Residential Construction: Installing Standing Seam Metal Roofs

When workers install standing seam metal roofs they are at risk of falling. Using a personal fall arrest system (PFAS) is the most common way to control falls during residential construction. However, these systems are not the only way to protect workers. This fact sheet describes various steps that roofing contractors may be able to take before and during roofing jobs to keep workers from falling. 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.

Workers Can Fall While Roofing

Roofers installing standing seam metal roofs risk permanent injury or death from falls. Even experienced roofers are exposed to unpredictable fall hazards caused by sudden gusts of wind, loose roofing 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.

Installing Standing Seam Metal Roofs Safely: Important Steps

Before beginning the job, focus on identifying fall protection needs. Survey the roof to determine if there are pre-installed anchorages available that can be used. If not, then begin planning immediately to identify those systems needed to protect workers from falls and have them in place before the workers report to the job.

Preparing the Work Site

Safeguarding against hazards is as important to preventing fatal falls as having good fall

protection equipment. Before work begins on a roof, employers need to prepare the site to protect workers from situations that could cause them to fall.

Preventing Slip Hazards

Workers should avoid working on metal roofs that are wet and slippery. If work must be performed in such conditions, have the worker wear proper slip-resistant soles to reduce slipping hazards.

Safeguarding skylights and openings: Every year, workers die from falling through openings and weak surfaces on roofs. Employers must protect workers around skylights and roof openings by using a personal fall arrest system (PFAS), covers or guardrails. Covers, when used, must be secured and clearly marked and must be able to withstand twice the weight that may be imposed on it at any one time (29 CFR 1926.502(i)).

Accessing the roof: Employers should ensure that safe roof access and egress is established and make sure that workers know how to get up and down in a way that minimizes the risk of falling. Extension ladders must extend at least 3 feet above the roof level to ensure safe access to the roof. Ladders must also be secured when they are used in locations where they may be displaced. For full requirements on the safe use of ladders, refer to 29 CFR 1926 Subpart X - Ladders.

Staging your materials: 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.

Performing Edgework

Roofers must work near the roof edge when securing metal roof panels to the roofing deck. Scaffolds, ladders, aerial lifts, and PFAS may be able to provide workers with safe access to the edge.

Communicating Your Needs

The contractor who is building and sheathing the roof structure will need fall protection equipment for workers. At a pre-construction meeting or at the first meeting on the work site, a roofer can ask the building contractor to leave roof anchors or other fall protection equipment in place after sheathing is completed.

Selecting the Right Equipment for the Job

Roofers must use fall protection equipment that meets OSHA requirements whenever they work 6 feet or more above a lower level. Depending on the tasks involved, where the work is taking place, and other circumstances specific to standing seam metal roofing, contractors can protect their workers using the following equipment:

- Personal fall arrest systems;
- Guardrails; or
- Ladders.

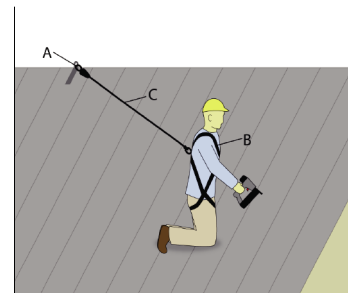
Note: Fall protection requirements for residential construction work performed on ladders are in Subpart X, not in 29 CFR 1926.501(b)(13).

Personal Fall Arrest System: A PFAS is one tool available to workers during roofing 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.

Fall Restraint: While fall restraint systems are not mentioned in OSHA's fall protection rules, OSHA will accept a properly utilized fall restraint system instead 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 a 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, as defined by 29 CFR 1926.32(m). 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.

Always follow the 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,

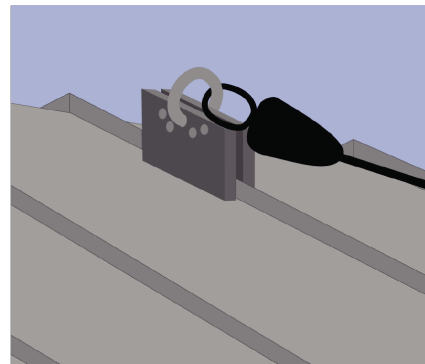
- **Peak anchor:** At the top of the roof, peak anchors are typically solid, non-moving pieces secured to the trusses underneath.
- **Permanent D-rings:** Inexpensive D-ring anchors are attached to the truss frame; they can be left permanently on the roof for future use.
- **Standing seam roof clamps:** There are different types of anchors available for standing seam metal roofs. Employers need to ensure that the type used is specifically designed for residential roofing. Always follow the manufacturer's instructions for safe installation and use. These clamps allow workers to securely anchor to the roof without damaging or penetrating the finished roof. The clamps are removed once work is complete and they can be reused,

making them a practical option for anchorage when installing or repairing standing seam metal roofs.

Install an anchor above the area being built:

Choose an anchor that is appropriate for the standing seam metal roof panels 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. Roofing is not always the last step in the construction process. Skylight windows and solar panels might be installed later during construction. Workers installing those units will also need fall protection anchors.



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 29 CFR 1926 Subpart L – Scaffolds.

Written Fall Protection Plans

When working at heights of 6 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)