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OSHA® FactSheet

Reducing Falls During Residential Construction: Installing Tile Roofs

When workers install tile roofs they are at risk of falling. Using personal fall arrest systems (PFAS) is the most common way to control falls during residential construction. These systems are not the only way to protect a worker and there are other options. This fact sheet describes various steps that roofing contractors can take before and during roofing jobs to keep workers from falling.

Workers Can Fall While Tiling Roofs

Roofers installing tiles risk permanent injury or death from falls. Even experienced roofers are exposed to unpredictable fall hazards caused by uneven sheathing, sudden gusts of wind, loose roofing materials, and surfaces that become slick when wet. Taking appropriate fall protection measures can reduce these risks and save lives. The employer shall provide a training program for each worker who might be exposed to fall hazards. The program shall enable each worker to recognize the hazards of falling and shall train each worker in the procedures to be followed in order to minimize these hazards. For fall protection training requirements, refer to 29 CFR 1926.503.

Tiling 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 available before the workers report to the job.

Communicating Your Needs

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

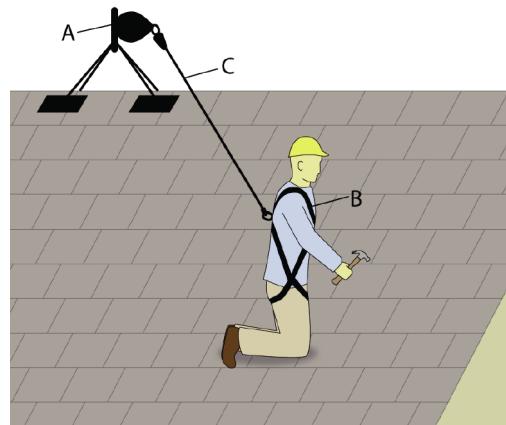
Using the Right Equipment

Roofers must use fall protection equipment that meets OSHA requirements whenever they work 6 feet or more above a lower level. States with OSHA-approved State Plans may have additional

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

requirements beyond OSHA requirements. Depending on the tasks involved, where the work is taking place, and other circumstances specific to tile roofing, contractors may be able to protect

their workers using the following equipment:

- Scaffolds
- Aerial lifts
- Personal Fall Arrest Systems (PFAS)
- Guardrails

Preparing the Work Site

Safeguarding against hazards is as important to preventing fatal falls as having good fall protection equipment. When work begins on a roof, employers must prepare the site by protecting workers from situations that could cause them to fall.

Wet or windy weather

Roofing should only be performed when weather permits. Wind and rain put workers at a greater risk for falling. In damp or windy weather, put work on hold until conditions improve.

Skylights and openings: Every year, workers die from falling through openings and weak surfaces on roofs. Employers must protect employees working around skylights and roof openings with covers, PFAS or guardrails.

Accessing the roof: Safe roof access is as important as having effective fall protection while on the roof. Employers must provide safe access and make sure that workers know how to get up and down from a roof in a way that minimizes the risk of falling. Extension ladders must extend at least three (3) feet above the roof level to ensure safe access to the roof. For other requirements on the safe use of ladders, refer to 29 CFR 1926 Subpart X – Stairways and Ladders.

Stage your materials: Preventing falls is as much about reducing the risks around workers as it is about having the right fall protection equipment.

Be sure to put all working materials in safe spots. Loose tiles and hand-held equipment create tripping hazards on the roof surface. Workers can fall after tripping or slipping on something they did not see. While walking on the roof and carrying materials, the worker should keep the materials on the down-sloped edge to prevent the materials from falling into the worker if the materials are dropped.

Performing Edgework

When installing the first rows of tile near the roof edge, workers have several fall protection options. In addition to a PFAS, scaffolds and aerial lifts can provide safe access to the edge.

Scaffolds: When properly constructed and used, external scaffolds can provide suitable protection for roof repairs along the edge of the roof. Pump-jack scaffolds offer a secure platform from which to work and can be raised and lowered for specific tasks, such as working from underneath the eaves. Guardrails along the scaffold will provide fall protection. For other requirements for scaffolds, refer to 29 CFR 1926 Subpart L – Scaffolds.

Aerial lifts: A portable boom lift can allow roofers easy access to the leading edge of the roof. The adjustable angle is useful for working on roofs of all grades. It offers an easy place for workers to tie off their lifelines and to work from within the basket. Care must be taken when loading material. Do not overload the lift. For other requirements for lift, refer to 29 CFR 1926.453 – Aerial Lifts.

Anchorage

When working in an area where a scaffold or aerial lift is not practical, workers can use a PFAS with a secure anchor. OSHA requires that anchors for a PFAS are 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 [29 CFR 1926.502(d)(15)]. Anchors must not be attached to sheathing alone, because it may not be strong enough to hold the sudden weight of a falling worker. Anchors should be fixed to a strong structural feature (like a sheathed truss). Always follow the manufacturer's instructions or consult a qualified person when installing anchors. 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, nonmoving pieces secured by the anchor to the trusses underneath.
- **Permanent D-rings:** Inexpensive D-ring anchors are attached to the truss frame; they are often removed after the job is done, although they can be left permanently on the roof.



Install an anchor above the area being built:

Choose an anchor that is appropriate for the tile type and anchor location. Depending on the roof

design, the best location might be at the peak of the roof, directly over a truss.

Leave anchors in place: Where practical, consider leaving anchors in place. It will 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.

Written Fall Protection Plans

If the employer does not use ladders, scaffolds, or aerial lifts, 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) when working at heights of 6 feet or greater, 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 as defined by 29 CFR 1926.32(m). This person could be the owner, the supervisor, or a worker who has extensive knowledge, training and experience with fall protection and is able to solve problems relating to fall protection. States with OSHA-approved State Plans may have additional requirements for written fall protection plans.

The site-specific fall protection plan must document at 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. Written site-specific fall protection plans ensure 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

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

OSHA Residential Fall Protection Web Page:

http://www.osha.gov/doc/residential_fall_protection.html

OSHA Compliance Guidance:

Compliance Guidance for Residential

Construction – STD 03-11-002 (dated 12/16/2010)

Available online at

http://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 within State Plans. For more information on these requirements, please visit: <http://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 safety and health management systems. To locate the OSHA On-site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit <http://www.osha.gov/dcsp/smallbusiness/index.html>

NIOSH Prevention Through Design Program

Available online at

<http://www.cdc.gov/niosh/topics/ptd>

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