Fall Protection for Roofing Operations

General Requirements

When is fall protection required?

Construction

- **6 feet** above lower level on construction sites
- **10 feet** above lower level on scaffolding
- **15 feet** above lower level for steel erection
- When steps are greater than **19 inches** tall

General Industry

- **4 feet** above lower level
- No fall protection required when tasks are "temporary and infrequent" – but best practice to use a fall protection system to reduce risk of serious injury or fatality

Flat Roofs

Four methods for fall protection on flat roofs - slope less than 4 in 12 (vertical to horizontal):

1. **Warning Lines**
   - Place them 6 feet from the roof edge for roofers only and 15 feet for all other trades.
   - Use stanchions that are 39-45 inches tall and capable of supporting a 16-pound tipping force.
   - Install a flag on the line every 6 feet.
   - Do not allow the line to sag below 34 inches.
   - Use a line with a tensile strength of 500 pounds.
   - Provide an access path to a ladder regardless of location.
2. **Guardrails**
   - Install a top-rail 39-45 inches from the walking/working surface. It must be able to support a 200-pound force outward and downward.
   - Install a mid-rail between the top edge of the guardrail and the walking/working surface. It must be able to support a 150-pound force outward and downward.
   - Each rail must be at least 1/4 inch thick (wood and cables). Cables must be flagged.
   - Protect skylights – section them off or install a guardrail around them.
   - Close roof hatches or install guardrails around them.
   - Cover holes in walking/working surfaces and label them with "hole" or install guardrails.

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3. Personal Fall Protection System

- Ensure the full body harness is the proper size and rated capacity for the specific application.
- Follow the instructions on the equipment label for manufacturer recommended inspection requirements and length of service.
- For fall arrest, anchor points must support 5,000 pounds per employee attached.
- For fall restraint, anchor points must support two times the potential load.
- Tied off properly with 6 feet of freefall equals a fall distance of AT LEAST 16.5 feet.
- Do not work more than 45 degrees from center point in either direction.

Two types of Anchors

1. **Penetrating**
   Screw down anchor plates – install in a suitable substrate such as 3/4 inch plywood, concrete or minimum 22-gauge metal decking.
2. **Non-Penetrating**

Non-Penetrating Type	Estimated Cost	Description
Cross Arm Straps	$30 - $50	Can be made to any length but 3 feet and 6 feet are standard.
Hold-Me Anchor Device	$30 - $50	Lifeline connection point that allows the user to wrap a lifeline around a roof penetration and is safer than tying a knot.
Parapet Wall Anchors	$300 - $1000	Will fit most wall widths. Provides one-person tie-off.
Weighted Plate Anchor Systems	$2,000 - $3,000	Several weighed plates that create friction.
Bladder Anchors	$2,000 - $3,000	900-pound water bladder on rooftop.
Tie-Off Carts	$4,000 - $5,000	Must be placed 12-15 feet from roof edge and no more than 15 feet from the roof centerline in either direction to prevent swing fall.

4. Safety Monitoring System

- Only use on roofs less than 4 in 12.
- Can be used as the lone system when roofs are less than 50 feet wide.
- Monitor must be a competent person with no other responsibilities and be easily identifiable.

Sloped Roofs

Two Methods for Fall Protection on Sloped Roofs- greater than 4 in 12 (vertical to horizontal)

1. **Scaffolding**
   - Can be sole method of fall protection for 8 in 12 pitch and below.
   - Over 8 in 12 pitch is considered an "uncontrolled" fall and must have another form of fall protection.
   - Cannot be more than 14 inches from the face of building.
2. **Personal Fall Protection Systems**
   - Penetrating roof anchors.
   - Mobile fall protection systems ($3,000-$5,000) – a ground-based system with a lifeline that goes up and over the roof peak to provide tie-off for up to six workers on the opposite slope.

Rescue Plan

Implement a rescue plan that includes details about the method of rescue:

- Calling 911
- Using a ladder from ground
- Using a hoisting device made for tie-off carts
- Using a manufacturer's rescue system