

USING ALTERNATIVE FALL PROTECTION ON ROOFS

This guidance only applies on a low slope roof (4:12 or less) when traditional fall protection systems cannot be used, such as a 42-inch parapet wall at the roof edge, guardrails, and personal fall restraint and arrest systems. This guidance does not apply to construction work advancing the roof leading edge or installing the roof deck.

Fall protection is required on any walking or working surface, including roofs, when there is a fall hazard of four feet. These **alternative systems** may only be used under specific circumstances and procedures.

Alternative systems include a warning line, a safety monitor and a safety watch. See Washington Administrative Code 296-880-40040, 296-880-40045, and 296-880-40050 for more information. Work on steep roofs (greater than 4:12) always requires guardrails or personal fall protection systems.

Warning line

Warning line systems, consisting of ropes, wires or chains and supporting stanchions, form a barrier around the work area to warn workers they are near an unprotected roof side or edge.

Roofing work is defined as the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work.

Roofing work near edge: 0 – 6 feet from edge

Warning lines are **not** allowed in the area between the roof edge to within 6 feet of the edge.

- Use guardrails, fall arrest or restraint systems in this area. Only when not feasible, use a safety monitor system to protect employees.
- Do not use/store mechanical equipment where the only protection is a safety monitor.

See the cross-hatched section of the diagram below.

Roofing work: greater than 6 feet from edge

- Erect warning line around the work area not less than 6 feet from the roof edge.
- When needed, use a safety monitor system in addition to warning line to protect employees.

See the red section of the diagram below.

Mechanical equipment use in roofing work:

- Erect warning line no less than 6 feet from the edge if no mechanical equipment is used.
- If mechanical equipment is used, erect warning line not less than 6 feet from roof edge, which is parallel to the direction of mechanical equipment operation; and not less than 10 feet from roof edge, which is perpendicular to the direction of mechanical equipment operation.

See the yellow section of the diagram below.

Repair work / servicing equipment:

- Erect warning line greater than 6 feet from edge.
- Use guardrails, fall arrest or restraint systems, or safety watch.

See the yellow section of the diagram below.

Work other than roofing:

- Erect warning lines not less than 15 feet from unprotected sides or edges of the roof.

See the green section of the diagram below.

Warning lines are erected as follows:

- Use only on low slope roof as part of an approved [Fall Protection Work Plan](#).
- Erect warning lines around all unprotected sides and edges of work area.
- The rope, wire, or chain must have a minimum tensile strength of 500 pounds, and after attached to the stanchions, must be capable of supporting, without breakage, the loads applied to the stanchions.

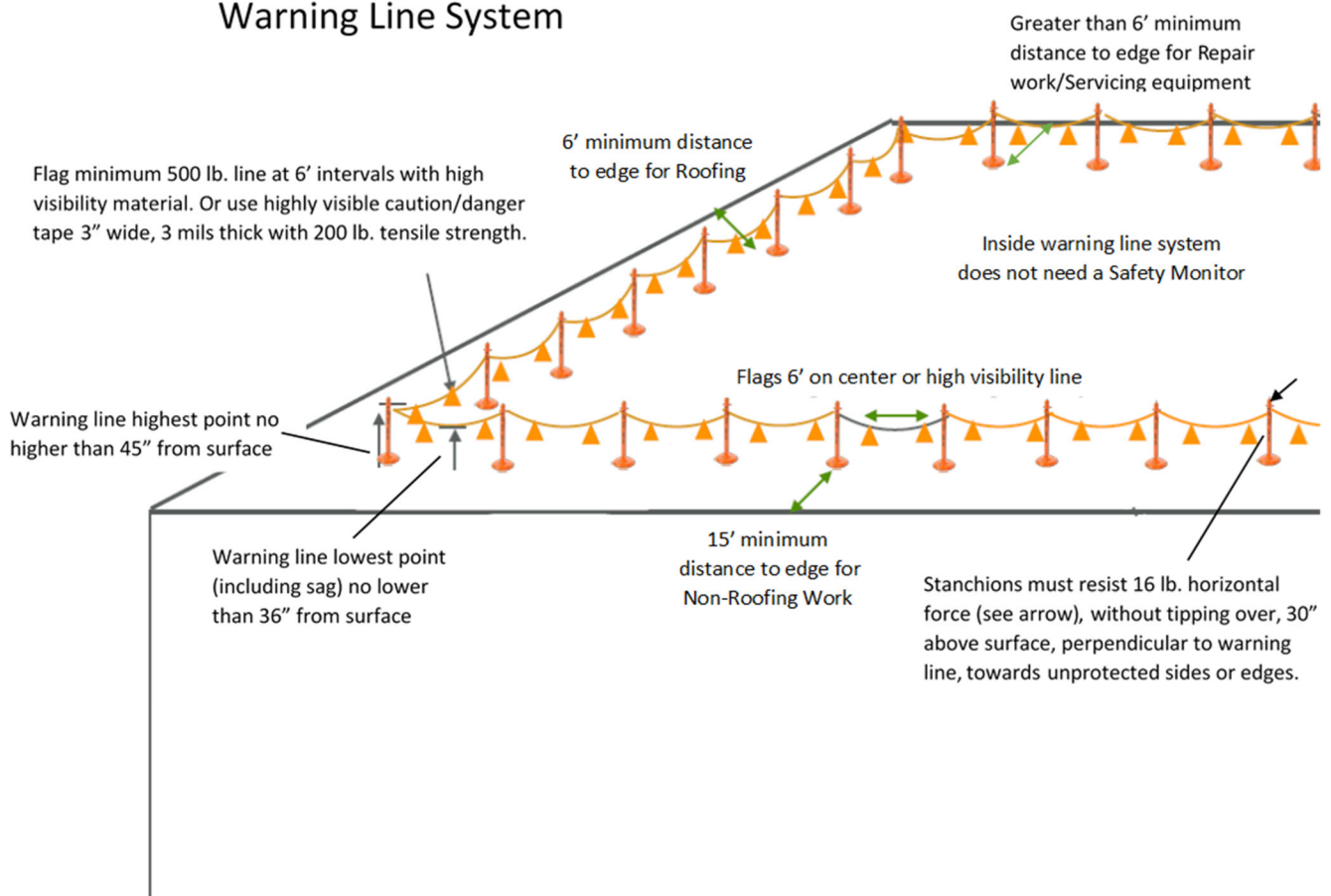
Note: Highly visible caution or danger tape may be used in lieu of rope, wire, or chain if it is at least three inches wide, three mils thick and has a tensile strength of at least 200 pounds.

- Flag line at 6 feet intervals with highly visible material. Highly visible caution or danger tape as described above does not need to be flagged.
- Rig and support line so its lowest point, including sag, is not less than 36 inches and not more than 45 inches from the roof or surface.
- After erected, with the line attached, stanchions will be capable of resisting a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the roof surface, perpendicular to the warning line, and in the direction of unprotected sides or edges of the surface.

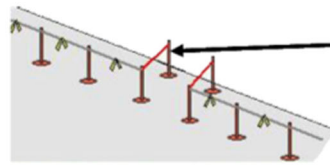
- Attach line at each stanchion so that pulling on one section of line between stanchions will not reduce slack in adjacent sections.
- Do not store materials within 6 feet of roof edge unless guardrails are erected at roof edge.
- Use a personal fall restraint or arrest system if working outside of a warning line.
- Connect points of access, materials handling and storage areas to the work area by a clear access path formed by two warning lines. When not in use, place a line across the path, equal in strength and height to the warning line.

Note: When a guardrail system or warning line system must be temporarily removed to perform a specific task, an employee must remain at the opening until the guardrail system or warning line system is replaced. The only duty the employee must perform is to warn persons entering the area of the fall hazard. The employee must be protected from the fall hazard by a personal fall arrest system or personal fall restraint system.

Warning Line System

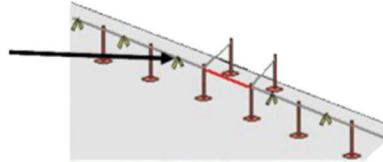


Point of Access



Points of access, materials handling and storage areas must be connected to work area by a clear path formed by two warning lines.

When the path to a point of access is not in use, place a rope, wire, or chain across the path where the path intersects the warning line. The rope, wire, or chain must be the same strength and at the same height as the warning line.



Safety monitor

A safety monitor system may be used in conjunction with a warning line system to guard against falls during roofing work on low slope roofs. A safety monitor system must be used if all other means of fall protection are not feasible within six feet of the roof edge. This system does not provide a physical means of preventing or arresting falls.

Ensure that the safety monitor system is addressed in the Fall Protection Work Plan, including the name of the safety monitor(s) and their training in both safety monitor and warning line systems. Do not use during adverse weather.

When using a safety monitor system on a roof less than 50 feet wide a warning line is not required.

Employees working outside of the warning line system, (between the forward edge of the warning line and the unprotected sides or edges of the roof), must be readily distinguishable from other members of the crew that are working inside the warning line by wearing highly visible, distinctive, and uniform apparel.

Employees must promptly comply with fall hazard warnings from the safety monitor.

The safety monitor(s) must be a [Competent Person](#) trained in safety monitor and warning line systems, and will:

- Have control authority over the work as it relates to fall protection
- Be instantly distinguishable from members of the work crew (i.e., wear brightly colored vest)
- Perform no other duties while in the role of safety monitor
- Have clear unobstructed view of workers and maintain normal voice communication
- Supervise no more than eight workers at one time
- Warn employees when they may be unaware of a fall hazard or acting in an unsafe manner

Safety watch

A safety watch system is a fall protection system, in which a Competent Person monitors **one worker** engaged in repair work or servicing equipment on low slope roofs and where exposure to falls is infrequent (not on a predictable and regular basis). A safety watch system requires:

- Only two employees be on the roof at a time—one employee as the safety watch and one employee performing the work
- Employee performing the task must comply with fall hazard warnings from the safety watch
- Work must not be within 6 feet of the roof edge
- No mechanical equipment can be used
- Do not use during adverse weather

The employee acting as the safety watch must:

- Be a Competent Person trained in safety watch system requirements
- Have full control over work related to fall protection
- Have clear, unobstructed view of the worker
- Able to maintain normal voice communication
- Perform no other duties while in the role of safety watch

SEE THE DIAGRAM BELOW TO ANSWER THESE QUESTIONS:

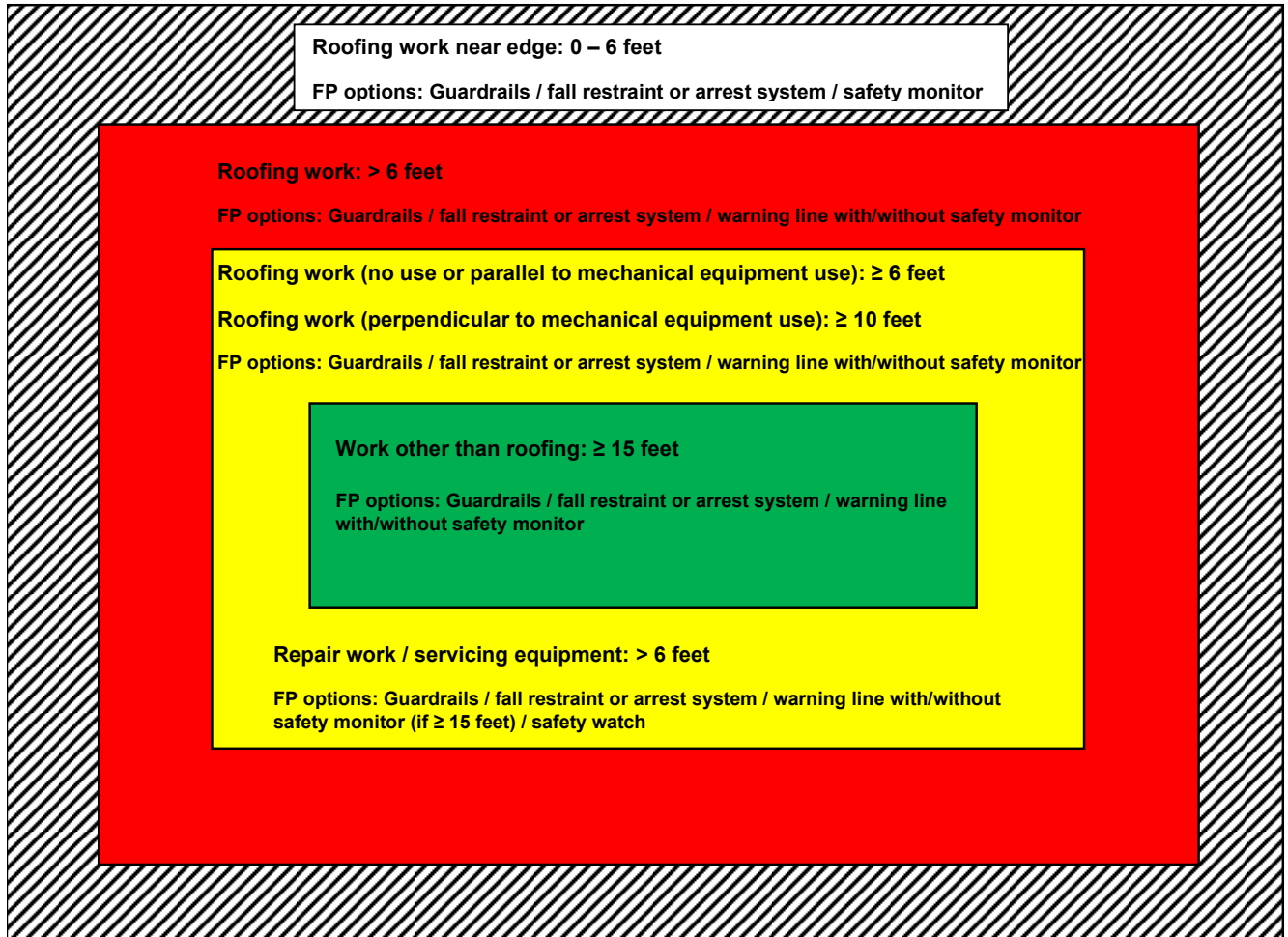
Where do I put the warning line?

What are the fall protection (FP) options for:

- > Roofing work near the roof edge?
- > Roofing work at other distances from the edge?
- > Roofing work when using mechanical equipment?
- > Work other than roofing?
- > Repair work or servicing equipment?

Continued on next page.

Roof edge



\geq = equal to or greater than
> = greater than

Contact EH&S at 206.543.7262 for more information about fall protection.