SECTION 7 - FALL PROTECTION PLAN - ROOF-SPECIFIC

Regulatory Basis: OAR 437-003-1501 (Fall Protection - Construction). Oregon OSHA's fall protection requirements meet or exceed 29 CFR 1926.501-503; OAR 437-003-1501 is the enforceable authority. References to 29 CFR in this section are for cross-reference only.

Purpose & Scope

Falls from rooftops are the leading cause of fatal construction injuries in Oregon. Oregon OSHA consistently cites fall protection violations as the most frequent serious citation in construction inspections. Every employee working at a height of 6 feet or more above a lower level must be protected by an approved fall protection method. For commercial and industrial roofing, no exceptions to this requirement are permitted. Oregon residential steep-slope roofing is subject to modified provisions under OAR 437-003-1501 - see the Oregon Residential Note in the steep-slope section below. When in doubt on any job type, apply PFAS (Option A) as the default.

This plan applies to all Demo Company LLC employees performing work on or near rooftops, including:

- All roof surfaces (low-slope and steep-slope)
- Roof edges, eaves, and perimeters
- Skylights and roof openings (see Section 10)
- Roof access points (ladders, hatches)
- Any elevated platform or scaffold adjacent to roof work

Oregon Penalty Reminder: A fall protection violation is automatically classified as a serious violation. Oregon's mandatory minimum penalty is $1,116 per exposed employee - a crew of 4 working without fall protection = minimum $4,464 in mandatory penalties. Willful violations carry penalties up to $161,323 CPI-adjusted; willful or repeat violations causing worker death can reach $250,000 (SB 592).

Oregon-Specific Fall Protection Methods

Oregon OSHA accepts all federal fall protection methods (29 CFR 1926.502) AND additionally accepts personal fall restraint systems as an Oregon-unique alternative. Oregon has maintained unique residential construction fall protection provisions since 1995.

Definitions

- Low-slope roof: Slope <=4:12
- Steep-slope roof: Slope >4:12
- Leading edge: Unprotected edge of a roof section under active construction
- Personal Fall Arrest System (PFAS): Full-body harness + lanyard/SRL + anchorage capable of supporting 5,000 lbs per worker - arrests a fall in progress
- Personal Fall Restraint System (Oregon-unique): Rigging that prevents a worker from reaching the fall hazard - does not arrest a fall but prevents the worker from reaching an unprotected edge or opening
- Safety monitor: A competent person designated to watch employees and warn of fall hazards
- Warning line system: A rope, wire, or chain barrier erected at least 6 feet from the roof edge

Trigger Heights

Work Type	Fall Protection Required
All roof work - low-slope and steep-slope	6 feet or more above lower level
Scaffold platforms adjacent to roof	10 feet minimum (OAR) - Demo Company LLC requires at 6 feet
Skylight and roof openings - all heights	Any height where fall through is possible

Fall Protection Methods - Low-Slope Roofs (<=4:12)

On low-slope roofs, select one of the following methods. Document the selected method in the daily pre-work briefing.

Option A: Personal Fall Arrest System (PFAS) - Preferred Method

- Full-body harness + shock-absorbing lanyard or self-retracting lifeline (SRL) connected to an approved anchor
- Anchorage: minimum 5,000 lbs per worker OR engineered system with 2:1 safety factor
- Acceptable anchors: structural steel members, engineered roof anchors, OSHA-compliant horizontal lifeline systems
- Prohibited anchors: HVAC units, pipe vents, chimneys, or any equipment not rated for fall arrest
- Maximum free-fall: 6 feet; total arrest distance must not result in worker contacting lower level or obstruction
- SRLs preferred over shock-absorbing lanyards - reduced free-fall potential

Total fall distance calculation required:

Lanyard length + deceleration distance + harness/connector elongation + worker height to D-ring + safety margin = must not reach lower level.

Option B: Personal Fall Restraint System (Oregon-Unique Method)

Oregon OSHA accepts personal fall restraint systems as an alternative to PFAS on low-slope roofs.

A fall restraint system:

- Prevents the worker from reaching the fall hazard - limits horizontal travel distance
- Is rigged so the worker cannot reach any unprotected edge or opening
- Is NOT designed to arrest a fall - it prevents the fall from occurring
- Anchorage rated for the restraint forces involved
- Lanyard or restraint line adjusted so worker's reach does not extend past the hazard point
- Must be documented in the site fall protection plan as the selected method

When to use fall restraint vs. PFAS:

Fall restraint is appropriate when the worker's task keeps them well away from the edge. If the task requires working within 6 feet of the edge, PFAS is the safer and preferred method.

Option C: Warning Line System + Safety Monitor

Use only when PFAS and fall restraint are not practicable; slope must be <=4:12.

Warning Line Requirements (OAR 437-003-1501 / 29 CFR 1926.502(f)):

- Warning line erected at least 6 feet from all roof edges
- At least 10 feet from roof edges when mechanical equipment is being used
- Tensile strength: minimum 500 lbs
- Flagged at intervals not exceeding 6 feet with high-visibility material
- Supported at stanchion intervals not exceeding 6 feet
- Rigged so that when contacted, the line remains vertical - maximum 2-inch sag at mid-span
- Stanchions capable of resisting a 16-lb side force without tipping

Safety Monitor Requirements (OAR 437-003-1501 / 29 CFR 1926.502(h)):

- A competent person designated as the safety monitor
- The monitor performs only monitoring - no other duties during monitoring
- Same working surface as employees; within visual distance; close enough for verbal communication without shouting
- Warns workers when they approach within 6 feet of the warning line
- One monitor cannot monitor more than one work gang

Documentation required when using Option C: Supervisor documents in writing:

- Date and location
- Name of designated safety monitor
- Why PFAS / fall restraint was not practicable

> WARNING: Residential Restriction: Option C (warning line + safety monitor) is NOT permitted as fall protection on residential construction (1-4 family dwellings) under 29 CFR 1926.501(b)(13). See the Residential Construction Fall Protection section above.

Option D: Guardrail System

- Top rail: 42 inches (+/-3 inches)
- Mid-rail: approximately 21 inches
- Top rail: withstand 200 lbs of force in any direction
- Smooth surface - no snag or puncture hazards

Fall Protection Methods - Steep-Slope Roofs (>4:12)

On steep-slope roofs, only the following methods are acceptable:

Option A: Personal Fall Arrest System (PFAS) - Required

- Same requirements as Section 7 Option A above
- Ridge anchors engineered for steep slopes strongly recommended
- Workers must not lean out beyond the anchor point without a work positioning system

Oregon Note for Residential Steep-Slope: Oregon has maintained unique residential construction fall protection provisions since 1995. Verify current OAR 437-003-1501 residential provisions with Emily Turner before beginning residential steep-slope work.

Option B: Personal Fall Restraint System

- May be used on steep-slope when rigged so worker cannot reach the unprotected edge
- Restraint line must be adjusted for the slope - a worker on a steep slope can reach the edge more quickly than on low-slope; rigging must account for this

Option C: Guardrail System

- Practical in limited circumstances (permanent rooftop guardrails on commercial buildings)
- Requirements same as Option D above

Warning line systems and safety monitors are NOT acceptable as sole fall protection on steep-slope roofs.

Roof Edge Work - Special Requirements

Employees working at or within 6 feet of any unprotected roof edge (low or steep-slope) must be protected by PFAS, fall restraint, or guardrails at all times. Warning line + monitor alone is NOT sufficient protection within 6 feet of the roof edge.

Equipment Requirements

Full-Body Harnesses:

- Must meet ANSI Z359.11; inspected before every use
- Straps adjusted so harness is snug but not restrictive
- D-rings, buckles, and webbing: inspect for wear, cuts, corrosion, chemical damage
- Labels must be legible: ANSI designation and manufacture date visible
- Any harness involved in a fall arrest event - even if visually undamaged - must be permanently removed from service per manufacturer and ANSI Z359.11 recommendations. Tag removed equipment "FALLEN - DO NOT USE" and destroy or return to manufacturer for evaluation. Do not return fall-arrested equipment to service.

Lanyards and SRLs:

- Shock-absorbing lanyards: maximum 6-foot length; shock pack must not be deployed
- SRLs: inspect housing, cable, hook, and swivel; replace per manufacturer schedule
- Snap hooks must be locking-type (double-action); non-locking hooks prohibited
- Rope grabs on vertical lifelines: inspect for worn cams and proper operation

Anchorage:

- All permanent roof anchors installed per manufacturer instructions
- Temporary anchors (deadweight, beam clamps) must be rated and documented
- Horizontal lifeline systems designed by a qualified person
- Anchorage inspection by designated competent person before each use

Fall Restraint Rigging:

- Document restraint anchor location and rigging length for each task
- Confirm restraint limits the worker's reach before the work begins
- Re-check rigging when the task location changes on the roof

Pre-Work Fall Protection Planning

Before any roof work begins, the supervisor documents:

- Task description and roof location
- Identified fall hazards: edges, skylights, roof openings, penetrations
- Fall protection method selected (PFAS, fall restraint, guardrail, or warning line + monitor)
- For PFAS: anchor points confirmed adequate; total fall distance calculated
- For fall restraint: anchor point and rigging length documented
- Equipment inspected and assigned by name
- Rescue plan confirmed (see Section 15)

Pre-Work Fall Protection Plan - on site and signed by Emily Turner.

Fall Protection Training

Per OAR 437-003-1501, all employees exposed to fall hazards receive training before working at heights. Training covers:

- Nature of fall hazards on the specific job
- Correct use and fitting of PFAS equipment - harness donning, D-ring positioning, lanyard/SRL selection
- Oregon-unique personal fall restraint systems - how they differ from PFAS; proper rigging
- Inspection procedures for harnesses, lanyards, SRLs, and anchors
- Procedures for setting up warning line systems and safety monitor requirements
- Rescue plan activation (see Section 15)
- Skylight and roof opening protection

Written certification of training required under Oregon rules. Training is documented with employee signature, date, and trainer name. Retraining required after any fall event or when behavior indicates misunderstanding.

Residential Construction Fall Protection (29 CFR 1926.501(b)(13))

When Demo Company LLC performs work on residential structures (defined as 1-4 family dwellings under construction, alteration, or repair), the following specific requirements apply under 29 CFR 1926.501(b)(13):

- Employees working at heights of 6 feet or more above a lower level must be protected by guardrail systems, safety net systems, or personal fall arrest systems (PFAS)
- Warning line systems and safety monitoring systems are NOT acceptable as sole fall protection methods on residential construction, regardless of roof slope or width. Option C (warning line + safety monitor) from the low-slope fall protection methods does not apply to residential work.

- The former OSHA directive (STD 03-00-001) that allowed alternative measures such as slide guards and safety monitors for residential construction was rescinded on June 16, 2011 (replaced by STD 03-11-002). Employers must comply fully with 1926.501(b)(13).

Alternative Fall Protection Plans (29 CFR 1926.502(k)):

If conventional fall protection is demonstrably infeasible or creates a greater hazard on a specific residential site, the employer may develop a written alternative fall protection plan under 29 CFR 1926.502(k):

- The plan must be prepared by a qualified person
- The plan must be site-specific - a generic plan is not acceptable
- The plan must demonstrate that conventional methods are infeasible or create a greater hazard - the employer bears the burden of proof
- The plan must be maintained at the job site and available for inspection

> Enforcement context: Residential fall protection (1926.501(b)(13)) is consistently among the most frequently cited OSHA standards nationally. Roofers have faced fines ranging from tens of thousands to hundreds of thousands of dollars for residential fall protection violations. All residential roofing crews must receive specific training on these requirements.

SECTION 8 - SKYLIGHT & ROOF OPENING PROTECTION

Standard Reference: 29 CFR 1926.501(b)(4)

Hazard

Skylights and roof openings (vent cutouts, HVAC penetrations under installation, access hatches) are fall hazards - they may not support a worker's weight even when covered with a fragile skylight dome. Dozens of fatal falls occur through skylights each year in the roofing industry.

The fundamental rule: Every skylight and roof opening must be treated as a potential fall hazard and must be protected before work begins in the area.

Skylight Types and Fall-Through Risks

Not all skylights present the same hazard profile, but all must be treated as fall hazards:

- Dome skylights (bubble skylights): Rigid acrylic or polycarbonate domes mounted on a curb. These may appear solid but can shatter under a worker's weight, especially when aged, UV-degraded, or weather-damaged. A dome skylight that has been in service for 10+ years should be assumed to have reduced impact resistance.
- Flat-panel skylights: Glass or acrylic panels flush with or slightly above the roof surface. These are especially dangerous because they can be nearly invisible from a distance and may resemble surrounding roof panels.
- Tubular skylights (sun tunnels): Smaller diameter openings (typically 10-21 inches) with a dome cap. While the opening may be too small for a full body fall-through, a worker stepping on the dome can break through and suffer serious leg or hip injuries. Protect all tubular skylights the same as full-size units.
- Painted-over or concealed skylights: On re-roofing jobs, prior roofers may have coated over skylights with roof coating, tar, or membrane, making them invisible from the roof surface. Painted-over skylights are one of the most dangerous hidden hazards in roofing. Always verify skylight locations from inside the building or from building plans before beginning tear-off or walkthrough.
- Translucent roof panels (fiberglass/FRP): Common on commercial and industrial buildings. These panels become brittle with age and will not support worker weight. They are frequently mistaken for solid metal panels, especially when dirty or faded.

Skylight Protection Requirements

- OSHA requires that all holes (openings) in a roof through which a worker could fall must be covered or protected
- A skylight dome alone does not constitute fall protection - it may shatter under worker weight
- Required protection methods:

Option A - Covers:

- Covers must support at least twice the maximum intended load (per 29 CFR 1926.502(i))
- Covers must be secured to prevent accidental displacement (screws, clips, or heavy weights as appropriate)
- Covers must be marked "HOLE" or "COVER" in large, visible letters (spray paint or marker is acceptable)

Cover Material Requirements:

- Plywood: Minimum 3/4-inch CDX or structural plywood for openings up to 4 feet in any dimension. For openings between 4 and 6 feet, use minimum 1-inch plywood or double-layer 3/4-inch with staggered seams. Openings larger than 6 feet in any dimension require engineered covers designed by a qualified person.
- Steel plate: Minimum 1/8-inch steel plate is acceptable for frequently trafficked areas or where equipment will pass over covers. Steel covers must still be marked and secured.
- Oriented Strand Board (OSB): Not recommended for skylight covers due to reduced impact strength compared to CDX plywood. If OSB is the only material available, use minimum 1-inch thickness and limit to openings 3 feet or less.

Cover Load Rating:

- The "twice the maximum intended load" standard means a cover for a walkway must support at least 400 lbs (2 x 200-lb worker with tools). Where equipment may cross the cover area, the load rating must account for the heaviest equipment anticipated.
- For a standard skylight cover protecting a pedestrian walkway, a 3/4-inch CDX plywood sheet properly secured over a 2x4 frame spanning the opening will typically meet the load requirement for openings up to 4 feet.

Cover Installation Methods:

- Screws (preferred): Use a minimum of four #10 wood screws or self-tapping screws into the curb or surrounding structure. Screws prevent accidental displacement from wind, vibration, or foot traffic. Pre-drill if necessary to prevent splitting.
- Nails: Acceptable but less secure than screws. Use a minimum of six 16d common nails. Nails are more prone to backing out from vibration and thermal cycling. Not recommended for covers that will remain in place more than 48 hours.
- Adhesive alone: Not acceptable as the sole fastening method for skylight covers. Adhesive may fail in heat, cold, or wet conditions.
- Weighted covers (non-fastened): Acceptable only when the cover cannot be displaced by wind or foot traffic. Weight must be sufficient to prevent accidental movement - a minimum of 50 lbs of dead weight distributed evenly. Weighted covers must be re-evaluated in windy conditions.

Cover Inspection Schedule:

- Covers must be visually inspected by the competent person at the start of each shift and after any weather event (rain, wind, hail)
- Check for: displacement, cracking, warping, loosened fasteners, missing or faded markings, water damage, and any signs that the cover has been stepped on or impacted
- Any cover showing damage, displacement, or degradation must be replaced immediately - do not attempt to repair a damaged cover in place

Temporary vs. Permanent Covers:

- Temporary covers (installed during active roofing work): Must meet all OSHA requirements above. Remove temporary covers only when the opening is permanently sealed or when permanent protection (guardrails) is installed. Temporary covers must be maintained daily.
- Permanent covers (part of the finished roof system): Must be designed and installed per building code and manufacturer specifications. Permanent covers installed by Demo Company LLC during a roofing project must be documented in the project close-out file.

Option B - Guardrail Systems:

- Standard guardrails (42-inch top rail, midrail, 200-lb force resistance) may be used around skylights and openings instead of covers
- Guardrails must be erected on all exposed sides of the opening
- Guardrails are often preferred over covers for large openings (6+ feet), openings requiring frequent access, or when the opening must remain visible/accessible for ongoing work
- Guardrail components must not extend over the opening itself - workers must not be able to lean over the guardrail into the opening

Option C - Personal Fall Arrest System:

- Workers must be protected by PFAS when working within 6 feet of any unprotected skylight or opening
- PFAS must be rigged to prevent fall through the opening
- PFAS is the required backup when covers or guardrails must be temporarily removed for active work on the opening

Identification of Skylights and Openings

- At the start of every job, the supervisor must identify all skylights, roof openings, and potential fall-through hazards during the pre-work site walkthrough
- All identified hazards must be noted in the daily safety briefing and communicated to every worker on the roof
- Skylights are often obscured by snow, standing water, or debris - brush clear before walking on roof surface

Discovery of Unmarked Openings:

- If any worker discovers an opening, skylight, or weak spot that was not identified during the pre-work walkthrough, the worker must immediately stop work, move away from the hazard, and notify the supervisor
- The supervisor must halt all work in the area until the opening is protected (cover installed, guardrails erected, or PFAS rigged)
- The newly identified hazard must be added to the site hazard map and communicated to all crew members before work resumes
- Never assume an opening has been identified by someone else. If you see an unprotected opening, report it - even if you believe it was already known. Redundant reports are safer than missed hazards.

Pre-Job Verification Methods:

- Review building plans or as-built drawings to identify skylight locations before accessing the roof
- Conduct an interior walk-through to locate skylights and roof openings from below - this is the most reliable method for identifying painted-over or hidden skylights
- On re-roofing jobs, interview the building owner or facility manager about known skylights, hatches, and penetrations
- Mark all identified skylight and opening locations on the site safety sketch before crews access the roof

Prohibitions

- Never walk on a skylight dome under any circumstances, even if it appears strong
- Never store materials on skylight covers
- Never remove a skylight cover without immediately replacing fall protection
- If a cover must be temporarily removed (active work on the opening), PFAS protection must be rigged before the cover is removed
- Never rely on existing skylight screens or guards as fall protection unless they have been verified to meet the twice-the-intended-load standard by a competent person
- Never route foot traffic paths across or adjacent to skylights when an alternative path is available

SECTION 9 - HOT WORK & TORCH-APPLIED ROOFING SAFETY

Regulatory Basis: OAR 437-003-0261 (Fire Protection - Construction); OAR 437-003-0265 (Flammable and Combustible Liquids); 29 CFR 1926.150-159 (reference)

Scope and Risk

Torch-applied roofing (modified bitumen application using open-flame propane torches) is one of the highest fire-risk activities in the roofing trade. Oregon's wildfire season (July-October) further elevates torch fire risk when ambient conditions are dry. Demo Company LLC treats torch operations as a high-risk activity requiring strict pre-work controls and dedicated fire watch at all times.

Operator Qualifications

- Only trained and authorized employees may operate roofing torches
- New employees demonstrate proficiency under direct supervision before working independently
- Authorization documented in the employee's training file
- Emily Turner maintains a current list of authorized torch operators

Authorized Torch Operators:

- _____
- _____

Pre-Work Fire Prevention Checklist - Torch Operations

Before igniting any torch, the supervisor confirms:

- ☐ Hot work permit issued (if required by building owner or GC - see Section 9.4)
- ☐ Fire watch person designated, present, and briefed
- ☐ Fire extinguishers (minimum 10-lb ABC dry chemical) placed within 30 feet of the work - minimum two extinguishers for torch work
- ☐ Combustible roofing debris cleared from a minimum 35-foot radius of torch work area
- ☐ Combustible material on walls, parapets, and curbs protected or removed
- ☐ Propane hose connections inspected for leaks using soapy water solution (never use flame)
- ☐ Propane cylinder stored upright and secured
- ☐ Cylinders not used as a torch rest, seat, or step
- ☐ All workers in the area notified of torch work
- ☐ During wildfire season (July-October): AQI checked; no torch if AQI >=151 without supervisor approval

Hot Work Permits

A Hot Work Permit is required when:

- Working on occupied or partially occupied buildings
- Required by the building owner or general contractor
- Working near combustibles that cannot be removed or protected

- Any re-entry roofing application on existing buildings

Hot Work Permit:

Date: _____ Project: _____

Work Location (roof area): _____

Type of Hot Work: [ ] Torch-applied membrane [ ] Welding [ ] Grinding [ ] Other: _____

Authorized Operator: _____ Fire Watch: _____

Duration: Start: _____ Est. End: _____

Pre-work checks:

- ☐ Combustibles cleared from 35-foot radius
- ☐ Two extinguishers within 30 feet
- ☐ Fire watch briefed - no other duties during watch
- ☐ Propane hose and connections leak-tested
- ☐ Propane cylinder upright and secured
- ☐ 30-minute post-work fire watch planned

Permit Issued By: _____ Time: _____

Hot work permits are retained with project records for a minimum of 5 years (aligned with general training record retention).

Propane Cylinder & Torch Safety

Cylinders:

- Transport cylinders upright with valve caps in place
- Never transport cylinders in an enclosed vehicle cab - truck bed with adequate ventilation
- Store cylinders away from heat sources, direct sunlight, and building openings
- Maximum temperature exposure: 125 deg F
- Cylinders must not be stored inside buildings overnight
- During Oregon's hot summers: monitor storage area temperature; shade cylinders from direct afternoon sun

Torch Operation:

- Use torch manufacturer-approved regulator and hose assembly - inspect before every use
- Hose inspected for cracks, cuts, abrasions, and connection integrity
- Check fittings for gas-tight connections with soapy water - never use a flame to check for leaks
- Use a striker to ignite the torch - never use a lighter or cigarette
- Never point a lit torch at another person
- Extinguish the torch when not actively applying membrane - never leave a lit torch unattended
- Maintain clearance from combustible structures - direct flame must not contact combustible substrate
- Pay special attention to roof penetrations, curbs, and parapet walls where flames can track into the building

Fire Watch Requirements

- A designated fire watch person remains on the roof during all torch operations
- Fire watch continues for at least 30 minutes after the last flame application - monitoring for smoldering or delayed ignition
- Fire watch duties are exclusive - no other work while serving as fire watch
- Fire watch must have:
- At least one charged fire extinguisher (10-lb ABC minimum) within immediate reach
- Clear line of sight to all torch work areas
- A charged mobile phone for 911 contact