



SEPARATING PEOPLE FROM HAZARDS

UNDERSTANDING ROOFTOP FALL PROTECTION

How to Winterize Your Roof for Worker Safety





UNDERSTANDING ROOFTOP FALL PROTECTION

Winter Edition

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Rooftop Fall Protection is Always in Season

We delight in a warm and active summer followed by a brisk and pleasant autumn. Yet, we are soon humbled by the inevitable arrival of winter.

Homeowners shovel their sidewalks so that no one falls on their property (and files a lawsuit)! Then, it is off to work, where businesses are expected to plow their parking lots, walkways, and entrances.

There is another aspect of winterizing for fall protection that is easy for companies and building owners to overlook: the roof.

Snow, ice, and cold, windy weather present significant challenges to accessing and working on the roof—whether for an emergency repair, a leaky hatch or skylight, or routine inspections and maintenance of building services equipment. The risk of a serious injury from a fall is always pronounced on a rooftop, and winter conditions make it worse.

It is never too soon to ensure that your organization has effective and compliant rooftop fall protection. Let the harsh winter give way to a bright, optimistic spring of continued worker safety and operational efficiency.



Working on a roof covered with snow or ice poses significant safety challenges. Identifying the hazards and installing compliant fall protection equipment can reduce your risk and liability.

The Consequences of Workplace Falls Are Real



Workplace fatalities due to falls add up one by one with little public notice. What if they all took place on one day, like an earthquake or railway accident? The uproar for companies and government officials to act would be overwhelming.

The latest available data from the Association of Workers' Compensation Boards of Canada (AWCBC) reports 993 workplace fatalities in 2022, up from 925 in 2019 (the year before the COVID-19 pandemic). 58 of the fatalities (5.8%) in 2022 were the result of a job-related fall.

As these incidents add up one by one, they take a horrible toll on the families, friends, and employers of deceased and injured workers. However, the public at large barely takes note. What if several deaths and injuries resulted from a natural disaster, transportation accident, industrial mishap, or if a large building caught fire? The public outcry would be massive.

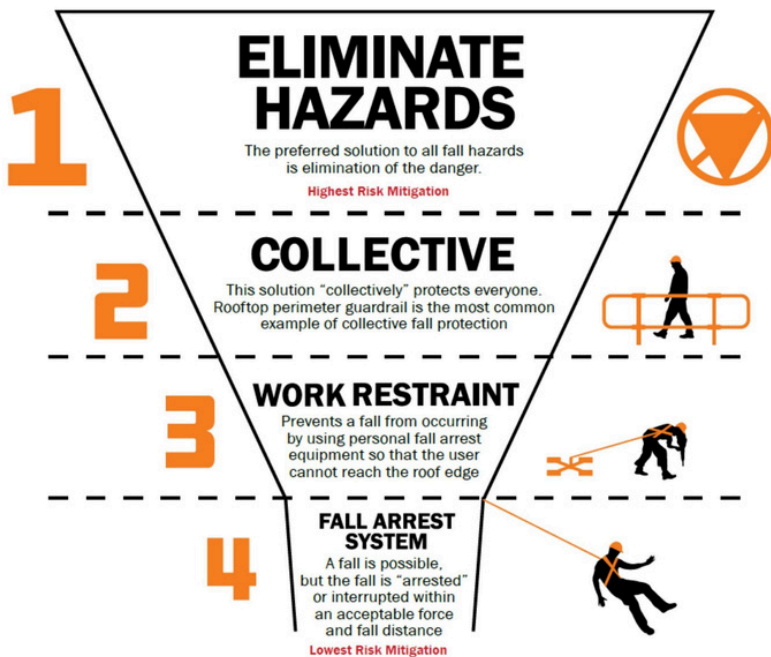
Fortunately, employers and regulatory agencies are taking notice. The 58 fatalities from falls in 2022 are down from 73 in 2019, when falls accounted for 7.9% of workplace fatalities.

According to the AWCBC, there were 348,747 accepted lost-time claims in 2022, with 51,682 (14.8%) due to a fall. Although total accepted lost-time claims in 2022 increased significantly from 271,806 in 2019, the number (55,139) and percentage (20.3%) of accepted claims from falls have decreased since 2019.

How can your organization ensure your employees are safe when working on the rooftop?

It starts with understanding the "Hierarchy of Fall Protection," which leads to recognizing the specific hazards on your rooftop. From there, installing the proper fall protection systems and equipment and providing necessary training can help keep your workers safe.

The Hierarchy of Fall Protection



The Hierarchy of Fall Protection is considered the gold standard of safety procedures, and a thorough rooftop safety solution should follow its guidelines.

A safety expert first inspects the roof site for potential fall hazards. Based on this assessment, a comprehensive system solution and recommendations are developed to address all four levels of the safety hierarchy—these range from straightforward risk-elimination strategies to essential personal protection systems.

Level 1 Eliminate the Hazard

The safest way to protect employees from falls is to eliminate the fall hazard. This can be done by altering the task so employees do not need to work at heights like the rooftop. For example, can building services equipment be placed on the ground level?

Level 2 Collective Fall Protection

The next best fall protection involves solutions that require minimal employee effort, known as collective or passive systems. These include railings or barriers that protect all workers without needing individual actions like wearing a harness. This eliminates the need for specialized training and reduces the chance of human error.

Level 3 Fall Restraint

Fall restraint (or work restraint) is the next option when elimination or collective systems are not viable. This involves using personal fall arrest equipment to prevent the user from reaching the roof edge or other hazards. However, the restrictions might hinder workers' ability to perform tasks or access necessary areas.

Level 4 Fall Arrest

If other solutions are not feasible, fall arrest is used. This method involves equipment that activates only after a fall, safely slowing and stopping the descent. It is the least desirable option due to the need for a fall to occur, potential equipment failure, injury risk during the fall, and the necessity for a rescue plan to prevent suspension trauma. Despite these drawbacks, fall arrest is preferable to a fatal fall.

The Top 4 Areas on Your Rooftop You Must Protect

Invisible from the street level and to the employees inside, the rooftop may seem isolated and lonely. Not necessarily. Inspectors, construction, maintenance, and repair workers access the roof and encounter various hazards while up there.

A fall protection expert should critically analyze your rooftop to identify the hazards where people are exposed to significant risk. This will ensure that the most dangerous areas are protected immediately with state-of-the-art systems and regulatory-compliant solutions.

Canada Occupational Safety and Health Regulations, SOR/86-304 Section 12.07 states that an employer must provide or put in place a fall-protection system if work is to be performed from a structure at the height of 10 feet (3 metres) or more or less than 10 feet (3 metres) below if the surface onto which the person might fall would present a greater risk of injury than a solid, flat surface.

If that doesn't apply to the roof, what does?

Federal and provincial regulations require employers to provide fall protection for work performed at a height of 10 feet (3 metres) or more.



#1 – Roof Access Points

Understanding how your workers access the roof is the first consideration. Access points are the most frequented hazard on any rooftop. Workers are exposed to this risk twice—every time they enter and exit the roof to perform tasks. A worker required to access the roof 8 times per year is exposed to the hazard 16 times—for each ingress on and egress off the roof.

Accessing the roof by a roof hatch or a ladder system are critical areas that must be protected.



Kee Hatch® Railing

Kee Hatch is a modular guardrail kit, including a Kee Gate self-closing safety gate that encloses the roof hatch so a worker cannot fall back through the hatch. This is especially important on a wet, snow-filled, or icy roof surface. Kee Hatch fits all new or existing roof hatches and is easy to install—no welding or drilling is required. Grab bars provide support for workers to access the roof safely.

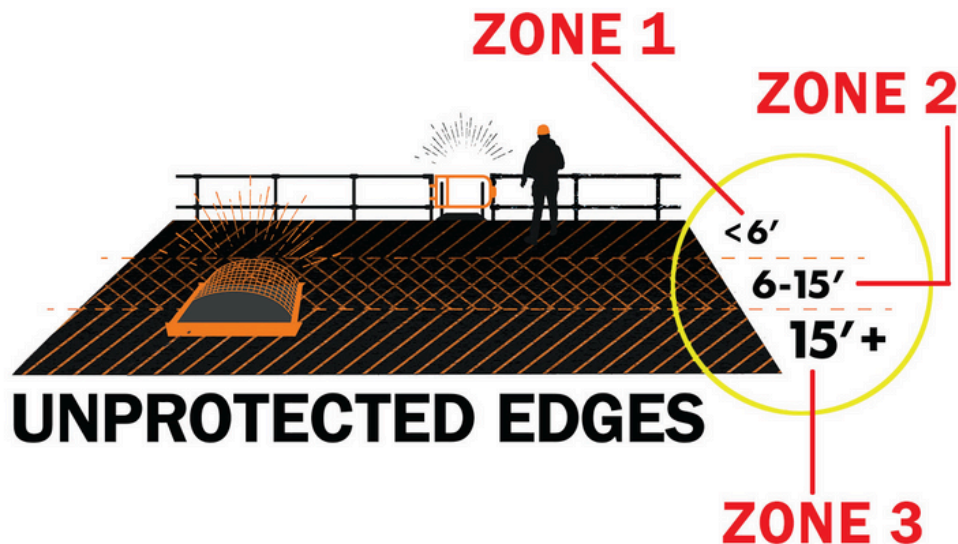
Kee Guard® for Ladder Access

Kee Guard for ladder access features a non-penetrating safety railing flanking the access point. A Kee Gate self-closing gate protects the opening to the roof. Surrounding supports ensure sufficient support when transitioning onto or off the roof.



#2 – Roof Edges

The roof's edge is the most visible hazard and typically what most people look to protect first. The risk is heightened during winter when battling cold temperatures and wet, icy, and windy conditions. Since proximity to the roof edge is a significant factor in identifying the likelihood of an accident occurring, regulatory agencies and safety professionals delineate three zones for working specific distances from the roof edge.



Zone 1:

When work is performed less than 6 feet (1.8 metres) from the roof edge, employees must be protected from falling at the roof edge by a guardrail system, a travel restraint system, or a personal fall arrest system.

Zone 2:

Employees working between 1.8 and 6 to 15 feet (4.6 meters) from the roof edge must be protected with the same systems as Zone 1; however, a designated area may be implemented when rooftop work is infrequent and temporary.

Zone 3:

Working 15 feet (4.6 meters) or more from the roof edge has the same criteria as Zone 1 and Zone 2; however, implementation, training, and enforcement of a work rule that prohibits access within 15 feet of the roof edge without using fall protection is permitted.

This applies only if the work is both infrequent and temporary.

What is Meant by Infrequent and Temporary?



Infrequent means that the work is performed occasionally, usually quarterly, or no more than once per month. Daily, regular, or routine tasks are not infrequent.



Temporary means that the work is brief or short. Temporary tasks should take less than two hours to complete and not be complicated.



Kee Guard® Roof Edge Railing

Kee Guard is a modular guardrail system that can be configured to fit the perimeter of virtually any flat or low-sloped roof. It features strong, durable, corrosion-resistant aluminum alloy or galvanized steel railings and connecting components. Recycled PVC bases anchor the system, which is easy to install and does not penetrate the roof membrane.

Kee Guard railing kits can be used as portable or temporary guardrails or in narrow spaces. Kee Guard for metal roofs is designed for metal profile and standing seam roofs up to 45 degrees in slope. It is also a non-penetrating system that uses base plates to connect to the roof without welding or drilling.

Kee Mark® Warning Lines

Kee Mark is a free-standing demarcation system that delineates safe passage areas on a rooftop. It features recycled PVC bases that support galvanized steel posts connected by stainless steel cables. High-visibility warning flags are draped from the cables. Kee Mark is a viable option for Zone 2 or Zone 3 and can work with other rooftop fall protection equipment.



Kee Line® Horizontal Lifelines

Kee Line is an engineered, energy-absorbing lifeline system that allows workers freedom of movement on the rooftop while always connected to the lifeline. Constructed of galvanized and stainless steel components, it can support up to three workers across spans of nearly 39 feet (nearly 12 metres) between anchorages.

Kee Line horizontal lifelines can be installed on membrane, structural, or metal sheet roofs or mounted from above. Kee Line can also be affixed directly to concrete, steel, brick, or stonework in horizontal or overhead applications.



Anchor options for Kee Line® include:

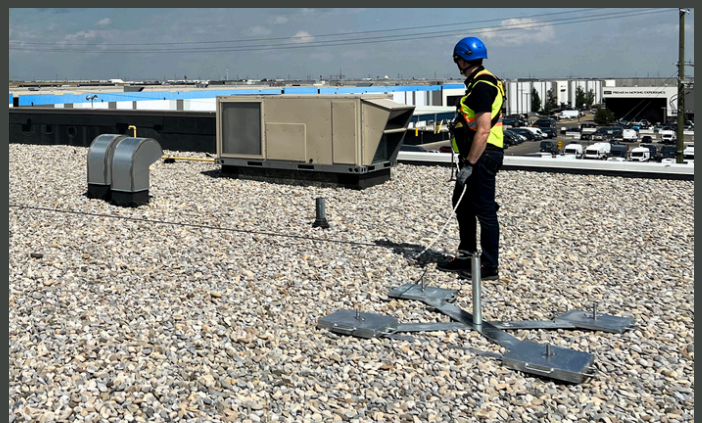


Kee Post®

Kee Post is a galvanized steel rigid anchor for permanent installation on a variety of roof types, including flat or low-sloped roofs, BUR membrane systems, single-ply membranes, modified bitumen, green roofs, and metal roofs with underlying structures of steel, concrete, or wood. It can be affixed by epoxy, shallow deck, cast-in, weld-on, wrap-around, bolted, screw-in, or beam clamp.

Kee Anchor®

Kee Anchor for multiple tie-off points is a mobile, deadweight anchor device used on roofs with a pitch of up to 5 degrees. Every central pedestal is anchored by four rubber-coated base weights with more than 100 suction cups moulded to the bases to maximize grip.



Work Platforms & Mobile Work Platform

Kee Platform work-at-height access platforms protect workers around the edges when they need to reach elevated heights on the roof, such as instruments, panels, filters, and other areas, to inspect, maintain, and repair heating, ventilation, air conditioning (HVAC), and other building services equipment. They feature anti-slip, self-draining treads for steps and platform decks—necessary for winter weather—encased in aluminum or galvanized steel frames with modular guardrails.



Fixed platforms are ideal for permanent installation. Mobile platforms are equipped with heavy-duty locking casters for station-to-station portability that is safer and more efficient than ladders. Work platforms can also be customized for adjustable height, outfitted with racks and shelves, provided with shop services (e.g., air, water, electrical), and furnished with a Kee Gate self-closing gate.

#3 – Roof Openings

Skylights are a popular rooftop feature—though exceptionally dangerous for rooftop workers. Skylights are technically holes in the roof, as many models cannot support the weight of even one worker. Falling through a skylight will expose a person to lacerations and further injury and create a risk for anyone inside below the opening.

Before winter weather arrives, mark all skylights with a prominent flag or marker so that workers can distinguish and avoid skylights covered in snow. (This is also an opportune time to mark roof drains, vents, and the safest routes across your roof to eliminate guesswork when performing tasks in the wintertime.)

Installing skylight screens or skylight railings will protect workers from falling through the glazed areas when traversing a snow-covered roof. They will not block the sunlight during better-weather days.



Kee Cover® Skylight Screens

Kee Cover curb-style skylight screens attach to the outer frame of the skylight with engineered clips. This does not compromise the skylight or penetrate the roof membrane, eliminating concern for leaks. Kee Cover is available in corrosion-resistant galvanized or stainless steel to withstand rain, snow, ice, and wind.

Kee Dome® Skylight Railings

Kee Dome skylight railings are ideal for larger, domed skylights and roof dome lights. They are a free-standing guardrail system that does not penetrate the roof membrane. Constructed of weather-hardy galvanized steel, Kee Dome is a modular system that surrounds the dome and can be easily dismantled, moved, and re-installed as required.



#4 – Roof Obstructions

Understanding paths your workers take across the roof is necessary for a complete fall protection assessment. Obstacles on the roof force workers to climb over or step around obstructions, placing workers at risk, especially during the winter. Hazards can include pipes, conduits, ductwork, gaps, or changes in the roof level. Furthermore, the roof itself is often slippery and unsafe during the winter, so extra measures are needed.

Kee Walk® Roof Walkways

The Kee Walk roof walkway is a modular system featuring anti-slip, self-draining treads made from anodized aluminum or glass-reinforced nylon. Set on aluminum or galvanized steel frames, it can be used on flat, barrel, or sloping roofs. It has a traverse option to access virtually any roof configuration from 0 to 35 degrees.



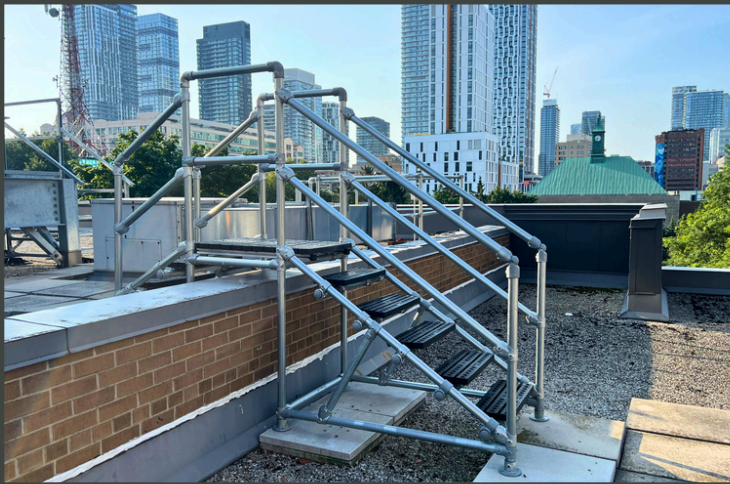
Kee Walk® with Guardrail

Kee Walk guarded walkways feature compliant guardrails on one or both sides to provide added fall protection. They can be installed at the roof edge or to provide a safe path virtually anywhere along the roof. The modular, corrosion-resistant system is engineered for all roof types, including pitched metal roofs and standing seam roofs with a slope of up to 35 degrees.



Kee Step® Rooftop Crossovers

Kee Step crossovers combine recycled PVC bases, anti-slip, self-draining treads, and modular guardrails to enable workers to overcome almost any obstacle on the rooftop, a gap in the roof, or a change in the roof level. They are available in standard sizes or easily customized for specific rooftop challenges. Easy to install without welding or drilling, Kee Step crossovers do not penetrate the roof membrane.



Kee Step® Mini Stepmover

Kee Step mini stepovers provide a simple, off-the-shelf solution for stepping over minor obstructions on the rooftop. They have non-slip, self-draining treads and can be used on membrane, asphalt, concrete, and PVC roof finishes.

Summary of Regulatory Standards



Key sections relevant to rooftop fall protection include:

Section 12.10 - Protection Against Falls

The law mandates that employees be protected by a guardrail system, a safety net, or a fall-arrest system when they are exposed to a fall of 8 feet (2.4 meters) or more.

Part XII - Protection Equipment and Other Preventive Measures

Covers the use and maintenance of protective equipment, including personal fall protection systems.

Rooftop fall protection is governed by federal, provincial, and territorial regulations to ensure worker safety.

The primary federal regulation is the Canada Labour Code Part II and its accompanying Canada Occupational Health and Safety Regulations (COHSR). These regulations apply to federal workplaces and also include the banking, telecommunications, and interprovincial transportation sectors.

Federal, provincial, and territorial safety officers inspect rooftops to ensure compliance with these standards. Non-compliance can result in fines, work stoppages, and other penalties. Employers must stay updated on regulations and implement comprehensive fall protection plans to ensure worker safety.



Key Elements of Rooftop Fall Protection Standards



Roof Access

- Safe access points, such as ladders, stairs, and hatches, must be provided.
- Access points should be free from obstructions and properly maintained.
- Use of guardrails or barriers around roof access points to prevent falls.



Roof Edge Fall Protection

- Permanent or temporary guardrails must be installed around the roof edge.
- Warning lines can be used to mark safe working areas away from the roof edge.
- Workers should use personal fall-arrest systems (harnesses and lifelines) when working near the edge.



Holes in the Roof

- Holes must be covered with materials that can support at least twice the weight of the workers and equipment.
- If covers are not feasible, guardrails should be installed around the hole.
- Clearly mark holes to alert workers of potential hazards.



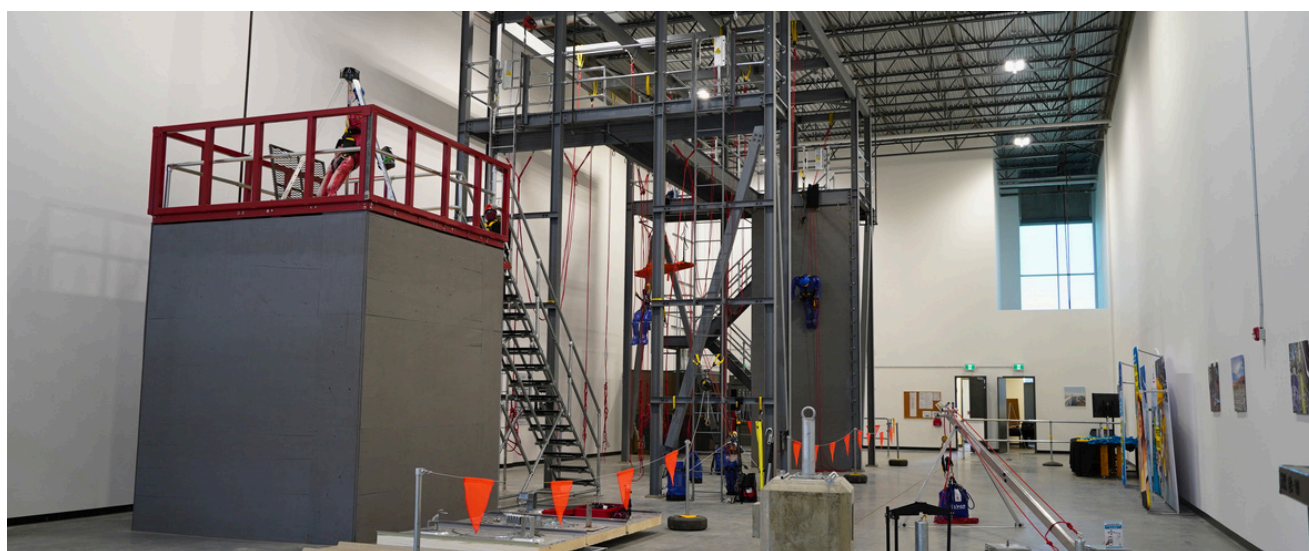
Obstructions on the Roof

- Ensure clear paths and walkways free from obstructions to prevent trips and falls.
- Highlight obstructions with bright colors and adequate lighting, especially in low visibility conditions.
- Workers should be trained to recognize and avoid hazards from roof obstructions.

Certified Fall Protection Training Enhances Worker Safety

Your responsibility for rooftop fall protection does not necessarily end with installing effective and compliant safety equipment. Are you and your workers versed in rooftop safety from theoretical and practical aspects? Do you know the applicable regulations? How do you become certified as a “competent person” to inspect and manage fall arrest systems?

An internal safety program or an outside agency can conduct training. Often, the fall protection expert is the company that manufactures and installs the rooftop system, and it will provide training on how to use its products safely and proficiently.



Specialized training classes to consider include:



» Working at Heights

This course provides the relevant skills, knowledge, and competence to work at heights safely using fall protection equipment. Coverage includes inspections, installation, and methods of use for specific fall protection equipment and the correct vertical and horizontal movement with energy-absorbing lanyards.

Certified Fall Protection Training Enhances Worker Safety

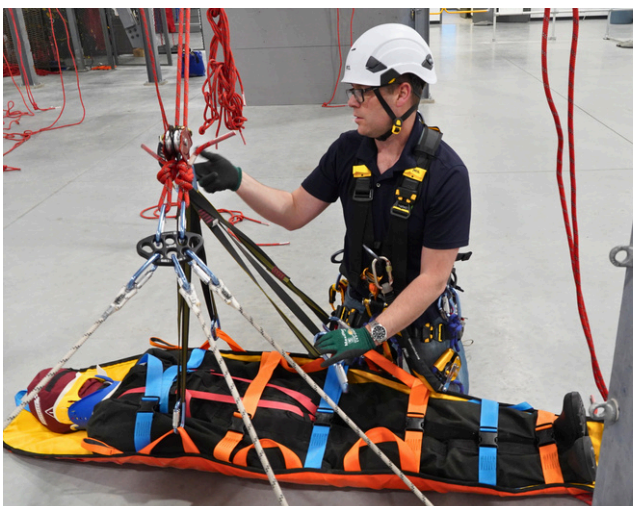


» Harness & Lanyard

This course is designed for people who are required to work in situations where they need the knowledge and competence to select and use the correct harness and lanyard system. It includes selecting anchor points and inspecting equipment within a basket, cradle, or scaffolding.

» PFPE Competent Inspector Training

This course is geared toward people who will conduct thorough examinations of Personal Fall Protective Equipment (PFPE) and be designated as “competent persons” to perform inspections. It covers roles and responsibilities under current legislation, including purchasing, identification, maintenance, storage, record keeping, and reporting.



» Rescue After a Fall

This is an advanced course for people with work-at-height training that provides the skills, knowledge, and competence to undertake a rescue after a fall of a person suspended by their lanyards. The course covers rescuing a casualty from fall arrest equipment using prepackaged rescue equipment, selecting anchor points, the rescuer’s fall protection, casualty management, and equipment check.

Protect Your Bottom Line with a Rooftop Safety Audit

Take a prioritized approach to rooftop fall protection. Assess the critical danger areas. Determine what tasks workers must perform on the rooftop. Measure how often workers need to access the roof.

We recognize that every rooftop has unique characteristics. A hazard assessment—or Rooftop Safety Audit—evaluates your rooftop onsite and/or remotely. We will apply our experience and expertise to determine what you need to do to comply with regulations and provide optimum safety for your workers.





**Contact one of our qualified Fall Protection Experts and schedule
a rooftop safety assessment today!**



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