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Roofs

Roofs come in all shapes, sizes, materials and height. Roofs are present in houses, offices, temporary buildings, shipping containers, gazebos and many other building types.

Falls from roofs are a common cause of worksite injury. Falling from a single-storey building can injure, maim or kill.

In Australia from 2008 to 2011, 123 construction workers died from work-related injuries. Falls from height accounted for 25% of fatalities (31 deaths) with falls from roofs involved in seven of the deaths. Falls are the leading cause of death in construction every year. These deaths are preventable.

The most common causes of roof falls are:

- inadequate safety precautions and fall protection undertaken;
- failure to implement adequate edge protection;
- tripping on obstacles; and,
- falling through a skylight or other opening (see penetrations).

Any worker can be injured when working on a roof. Be sure to take appropriate precautions whether you are working on the roof, or in the vicinity of others who are.

Roles and responsibilities

Every person on a worksite has a duty to ensure their safety and the safety of those around them. If a worker identifies a potential hazard that may put someone's safety at risk, they are to notify their supervisor immediately.

Person conducting a business or undertaking

A person conducting a business or undertaking (PCBU) has the primary duty under the [Work Health and Safety Act 2011](#) to ensure, as far as reasonably practicable, that workers and other persons at the workplace are not exposed to health and safety risks arising from the business or undertaking.

A PCBU at a workplace must manage risks to health and safety associated with a fall by a person from one level to another that is reasonably likely to cause injury to the person or any other person.

The [Work Health and Safety Regulation 2011](#) for construction work, high-risk work and falls need to be complied with when working on roofs. It is the responsibility of the PCBU to inform all workers on site that they must adhere to the requirements of the work plan and safety information before any person seeks or gains access to the roof.

A PCBU must ensure, so far as is reasonably practicable, that any work that involves the risk of a fall is carried out on the ground or on a solid construction.

The PCBU must consult, cooperate and coordinate activities with all other persons who have a work health or safety duty in relation to the same matter, so far as is reasonably practicable.

The PCBU are responsible for providing workers with information, training, instruction and sufficient signage as is necessary to enable them to perform a task on a roof in a safe manner and provide safe access to and exit from the workplace.

Where it is not possible to eliminate the risk of a fall, the PCBU must provide fall prevention equipment and devices which could include a secure fence, edge protection, working platforms, covers, fall arrest systems or work positioning systems.

The PCBU are responsible for developing safe work, emergency and rescue procedures in relation to working on roofs that comply with the regulations, Australian standards and codes of practice and ensure those procedures are being carried out correctly.

Management or Control

A person with management or control of a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace and anything arising from the workplace are without risks to the health and safety of any person.

Workers and contractors

Workers have a duty to take reasonable care for their own health and safety and that they do not adversely affect the health and safety of other persons. Workers must comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the workplace.

Employees and contractors are responsible for having a safe work method statement and ensure each task is examined to determine whether there is a risk and how that risk can be eliminated or minimised.

Employees and contractors are responsible for applying the regulations, codes of practice and safe work procedures that relate to working on roofs.

Employees and contractors are responsible for reporting any non-compliant roof protection systems to the PCBU or manager to ensure fall protection on roofs is maintained.

Quick guide to fall prevention

- Use edge protection or fall protection equipment.
- Install perimeter protection on solid construction.
- Install guarding for penetrations, skylights and fragile roofing.
- Inspect fall protection equipment prior to every use.
- Use correct and in-service fall protection equipment.
- Train everyone in the safe use of the equipment.
- Assess the risks to get the job done safely.
- Provide the right equipment for the Job.
- Don't disconnect from the restraint line.
- Don't work around unprotected penetrations or skylights.
- Don't use defective equipment.

Edge protection

Where there is a risk of a fall from or through the roof structure and there are no other means to prevent a fall, temporary edge protection and/or scaffolding should be installed.

Perimeter or edge protection should be installed on all exposed edges of a roof including the perimeters of buildings, the perimeters of skylights or other fragile roof materials, and any openings in the floor or roof.

What do I need to know about edge protection?

Edge protection is used to prevent people, tools, and materials from falling:

- around the perimeters of a work area;

- around openings; and,
- where brittle material cannot safely support the weight of a person.

Edge protection comes in different forms such as:

- a proprietary 'off the shelf' system;
- scaffolding that supports a temporary edge protection system; and,
- timber to form a guard rail and/or physical barrier.

Edge protection is the preferred control for preventing falls from roofs on single-storey buildings because it isolates multiple workers from the risk of a fall.

If this is not reasonably practical then the use of scaffolding, elevating work platforms or temporary work platforms are more acceptable alternatives.

How do I use edge protection?

Plan ahead

Plan for when you will need edge protection. Sourcing and erecting edge protection may take time.

Install edge protection as early as possible on a job so multiple groups of contractors, sub-contractors and workers can use it throughout the project, for example builders, electrical workers, and roofers.

Installing edge protection

Erect, use, and maintain edge protection according to the standard or manufacturer's instruction, or design specifications.

Think about and manage how the edge protection will be erected, as people may be exposed to the hazards of working at height during its installation.

Guardrails

Fit edge protection with a top rail, mid rail and toe board where the potential fall exceeds 2 metres or the fall area contains hazards such as sharp objects.

Specifically ensure:

- top rail is no less than 900mm above the point where a worker could stand adjacent to the edge protection;
- mid rails have a clear distance between rails that does not exceed 500mm; and,
- a clear distance between a mid-rail and the toe board or bottom rail should not exceed 400mm.

Inspecting edge protection

Ensure that any installed edge protection is monitored and reviewed, especially after a storm or other occurrence that could affect its ability to prevent falls.

Total restraint system

A total restraint system protects a worker from approaching an unprotected edge, thereby preventing a fall from occurring.

The system uses a full-body harness which is anchored to a stable, fixed point via an energy absorbing lanyard and is set up so the worker is unable to reach any edge that presents a danger. The fixed point is usually an installed temporary roof anchor point.

A trained and competent person should install the temporary roof anchor and check that the system is functioning correctly. Workers should not work in isolation when using a total restraint system.

Checklist for working on roofs

Factor	Best practice	Options if best practice not available
Safe access to roof areas <ul style="list-style-type: none"> No permanent access 	<ul style="list-style-type: none"> - Provide a scaffold stairway access tower - Provide properly constructed temporary access 	Portable industrial-grade ladders <ul style="list-style-type: none"> minimum 120 kilograms load rating secured against movement pitched at about 75 degrees (4:1) Extending 1 metre above the stepping-off point
Roof inspection	Inspect to determine the roof's strength including the fixing and strength of safety mesh	Strengthen any suspect areas of roof support with temporary props or similar
Falls from roof edges <ul style="list-style-type: none"> potential for falling corrosion 	Install compliant edge protection	<ul style="list-style-type: none"> Static line systems including travel restraint systems and fall arrest systems Use barriers to restrict access a minimum 2 metres from an unprotected edge
Incomplete roofs <ul style="list-style-type: none"> Is a risk present from incomplete or damaged roofs? 	Use safety mesh before the roof is laid	Use barriers or total restraint systems to separate roof workers from areas not yet meshed
Falls through penetrations <ul style="list-style-type: none"> Is there a risk of falling through skylights, holes or other penetrations? 	Use safety mesh before the roof is laid	<ul style="list-style-type: none"> Securely cover skylights and penetrations or isolate with temporary edge protection Use barriers to restrict access minimum 1 metre high and at least 2 metres from hazard
Falling materials <ul style="list-style-type: none"> Could materials such as tools, equipment or other supplies fall from a height and hit someone? 	Isolate the areas below roof work where people may be struck by falling material, debris or tools	Isolate areas under roof edges unless toeboards are fixed to temporary edge protection to contain all material, debris and loose tools

Factor	Best practice	Options if best practice not available
Weather related hazards <ul style="list-style-type: none"> • Could the weather such as heat, cold, rain, wind or ice pose a risk to workers and others? 	Consider: <ul style="list-style-type: none"> • conditions of the roof surface • moisture conditions • wind speed • UV exposure • roofing material being installed 	<ul style="list-style-type: none"> • Roof workers to wear non-slip flexible grip protective footwear • Commercial roofing • Steel toe-capped soft shoes • UV radiation and sun glare • Wear sun screen, hats and sunglasses

How to assess a site with roofs

An assessment needs to occur at all sites where roof work is required.

Do I need to work on the roof?

- Does the task actually require roof work or is there a safer alternative?
- Can the roof be accessed internally to avoid using ladders and scaffolding?

If it is determined that working on the roof is required, ensure it is assessed appropriately and precautions are taken.

Ensuring safety while on a roof

- What is the roof made from? Is it strong enough to support you? Has it deteriorated due to age or weather? Does it require an inspection by an engineer?
- How high is the roof? The higher the roof, generally the higher the risk of a fall and injury or death unless high order safety measures are in place.
- Is the person who will undertake the task experienced or trained?
- How do workers access and descend from the roof or different levels on the roof? Are the access measures safe?
- Will tools or equipment be required on the roof? If so, how are these to be lifted to the roof in a safe way?
- Will exposure to the weather such as rain, wind or bright sun create dangerous working conditions?
- Is the work required in close proximity to electricity or electrical sources?
- Does the area below the work area present a danger such as impaling hazards or rubble?
- Are adequate safety measures already in place, such as guard rails, safety mesh, scaffolding etc.? If not can these be applied?
- What supervision will be provided for workers working at height?

With these questions answered, you will be well placed to determine whether working on the roof is suitable and whether adequate safety precautions have been undertaken.

Real stories

Every year many Australians are hurt or killed through falls from roofs. The following are real life examples of such incidents.

Case study One

Fatal fall from roof - A man died when he fell 28 metres from the roof of a building onto concrete paving. The man, a labourer, was working as part of a four-man team on replacing a roof. At the time of the accident the deceased and his co-workers were finishing off their day's work. The workers were securing a stack of unused roof decking onto the existing upper pitched roof. It was while carrying out this task that the man fell to his death. Fall arrest equipment was being worn by all four workers and all but the deceased were connected to an appropriate anchorage. Some time prior to his fall he had disconnected his lanyard from the lifeline rope chuck.

Case study two

Fatal fall through roof skylight - A 28 year old man died of head injuries when he fell through the roof of a packing shed while trying to repair a loose sheet of iron. The young man, although employed as forklift driver and shed hand, was often sent onto the saw tooth roof to carry out minor repairs for his employer. Tradesmen were only called in when major repairs were needed. On this occasion the man fell five and a half metres through a fibreglass skylight onto the concrete floor below. No safe access to the roof was provided, there were no signs warning that the roof had fragile sections and there was no safety mesh beneath the skylight.

Case study three

Fall from roof - A 48 year old man suffered head injuries when he fell about eight metres through unsupported asbestos cement sheeting onto a concrete floor. At the time of the accident, he was employed by a company who were engaged in removing the asbestos cement sheeting.

The roof area of this building was very fragile. Access to the work area was provided by means of unsecured ladders and no perimeter protection such as scaffolding or handrails had been erected. There was no safety mesh beneath the roof and the injured worker was not wearing any personal safety equipment. Fall arrest equipment was stored in a work vehicle on the site for the use of any employee who required it. Had management ensured that their workers used the equipment, this man may have escaped serious injury.