MANAGING THE RISK OF FALLS

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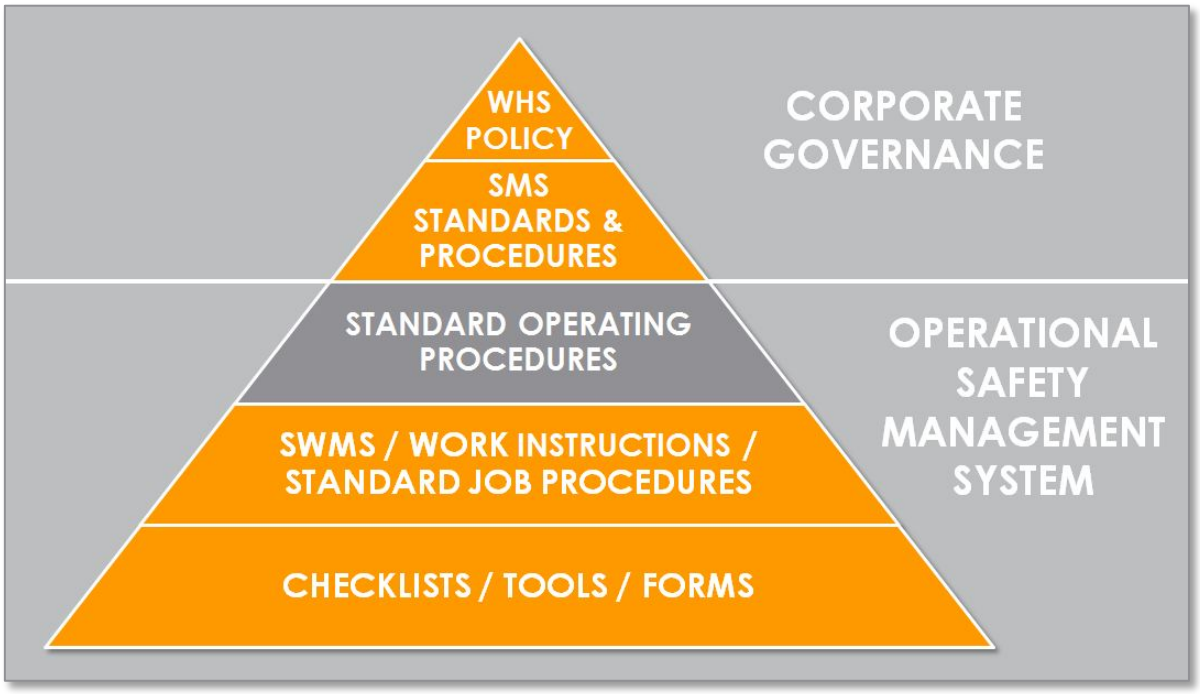
1. SMS DOCUMENT HIERARCHY



2. PURPOSE

This standard operating procedure (SOP) establishes the requirements for the management of the risk of falls from height at QUU workplaces and sites. In particular it:

- Sets out the requirements and procedures for the protection of people undertaking work that presents a risk of falling or being struck by falling objects that is reasonably likely to cause injury and or property damage.
- Details the risk assessment process and compliance requirements to eliminate or minimise potential fatalities, injuries and incidents arising from risks related to falls.

3. SCOPE

This standard operating procedure (SOP) applies to all of the QUU staff, workforce, including contractors and other persons on QUU-controlled worksites.

4. DEFINITIONS AND ACRONYMS

Administrative Controls: Systems of work or work procedures which eliminate or reduce the risk of a fall.

Anchorage: A secure point for attaching a lanyard, lifeline or other component of a travel restraint system or fall-arrest system. Anchorages require specific load and impact capacities for their intended use.

Attachment Hardware: Any ring, hook, karabiner, tube nut connector or other connecting device located in such a position that it must sustain by itself the full loading of a fall-arrest.

Edge Protection System: Edge protection system complying with AS 1657. Includes, guard railing of between 900 mm and 1100 mm high and a toe-board of not less than 100 mm high fitted at sides, edges and openings except at points of access from a stairway or ladder. There shall be no opening of more than 450 mm between the guard railing (top rail and mid rail) and toe board and no more than 10 mm between the toe-board and platform deck.

Fall-Arrest System: An assembly of interconnected components comprising a harness connected to an anchorage point or anchorage system either directly or by means of a lanyard, lanyard assembly or pole strap, and whose purpose is to arrest the fall of a person.

Fall Hazard: A source (i.e. task, object or location) that has the potential to result in a fall injury.

Fall Injury Prevention System: Equipment or material or a combination of equipment and material that is designed to arrest the fall of a person.

Free Fall: A fall in which the distance a person using a fall-arrest harness system falls vertically before the system starts to take loading is more than 600mm (for details on how to calculate free fall refer to AS1891.4).

Full Body Harness: An assembly of interconnected shoulder and leg straps, with or without a body belt, designed for attachment to a lanyard, pole strap or fall-arrest device for fall-arrest or work positioning purposes.

Inclement Weather: Prevailing or changing weather conditions that may present a risk to the health and safety of personnel, these conditions may be in the form of any of the following; excessive heat, cold, rain, hail, ice, snow, wind or lightning.

Ladder Register: this is a register of all portable ladders held on a site which includes the dates of their last inspection.

Lanyard: A line used, usually as part of a lanyard assembly, to connect a harness to an anchor point or static line.

Lanyard Assembly: Consists of a lanyard and personal energy absorber. The lanyard assembly must be as short as practicable and the slack working length no more than 2m.

Limited Free Fall: A fall in which the distance a person using a fall-arrest harness system falls vertically before the system starts to take loading is not more than 600mm.

Manager: as per QUU naming conventions, the Manager who has direct responsibility for the activity being performed or the area the activity is occurring in.

Passive Fall Prevention Device: Material or equipment, or a combination of material and equipment, that is designed for the purpose of preventing a fall, and that, after initial installation, does not require any ongoing adjustment, alteration or operation by any person to ensure the integrity of the device to perform its function.

Pendulum Effect: If a person using an individual fall-arrest system falls, the system may act as a pendulum, and in some situations the user may hit the ground (called 'swing down') or swing back onto the building or structure (called 'swing back').

Personal Energy Absorber: A device or component used in conjunction with a harness which by design reduces the deceleration force imposed by a suddenly arrested fall.

PICOW: acronym used for Person In Control of Worksite

Risk of a Fall: A circumstance that exposes a worker while at work or other person while at or in the vicinity of a workplace, to a risk of a fall that is reasonably likely to cause injury to the worker or other person. This includes circumstances in which the worker or other person is:

- In or on plant or a structure that is at an elevated level;
- In or on plant that is being used to gain access to an elevated level;
- In the vicinity of an opening through which a person could fall;
- In the vicinity of an edge over which a person could fall;
- On or in the vicinity of a surface through which a person could fall; and
- On or near the vicinity of a slippery, sloping or unstable surface.

Solid Construction: An area that has a surface capable of supporting any people and material that may be on it and has barriers around its perimeter and any open penetrations to prevent a fall from the area. It must have an even and readily negotiable gradient and a safe means of access and egress.

SMS: acronym used for Safety Management System.

Supervisor: Term used for any QUU employee who acts or is appointed as a Supervisor, Coordinator or Team Leader within QUU.

Suspension Intolerance: A natural human reaction to being upright and immobile. Blood pools in the legs potentially leading to unconsciousness. If the condition is allowed to develop unchecked, it could be fatal.

Unprotected Edge: Any edge without a handrail / parapet or with a handrail / parapet of less than 900mm in height, at which a fall hazard is present and/or where a gap, void or space of more than 300mm exists and which is not provided with a barrier to prevent a fall.

WHS: acronym used for Work health and safety.

Work Positioning System: Equipment, other than a temporary work platform that enables a person to be positioned and safely supported at a work location for the duration of the task being undertaken at height. These systems prevent a worker falling over an unprotected edge.

Worker: Employees, contractors, subcontractors, outworkers, apprentices and trainees, work experience students, volunteers and PCBUs who are individuals if they perform work for the business.

5. ROLES AND RESPONSIBILITIES

Outlined below are responsibilities specific to operational requirements for managing the risk of falls at all QUU workplaces and controlled sites.

5.1 QUU EXECUTIVE

QUU Executive and Senior Management (CEO, ELT, General Managers – Officer and Non-Officer Appointed) are responsible for the following;

- Overseeing and ensuring the implementation of the requirements of this SOP and related procedures within their respective functional areas.
- Ensure adequate resources are available to enable the effective implementation of this SOP.

5.2 MANAGERS

Managers in all operational areas and QUU worksites shall ensure that the risks of falls are minimised through the following controls:

- Ensuring that the requirements of this SOP and related procedures are followed in all areas of responsibility.
- Communicating the requirements of this SOP to their respective areas of responsibility.
- Manage the requirements for maintenance of equipment relating to managing the risk of falls e.g. harnesses.
- Establishing a training and competency program in accordance with this SOP.
- Ensuring that all required work area / equipment inspections are completed thoroughly by suitably trained and competent persons, in a timely manner.
- Ensuring records and registers of equipment and inspections are held on site and within TRIM.
- Providing suitable equipment and tools for managing the risks of falls to QUU personnel, contractors and visitors.
- Providing employees, contractors and visitors with fit for purpose personal protective equipment.

5.3 SUPERVISORS

Supervisors, Team Leaders and PICOW in all operational areas and QUU worksites are responsible for ensuring that the following is undertaken to minimise the risk of falls:

- Identify through the risk assessment process tasks where there is a potential risk of falls can occur. This must occur through consultation with the workers performing the tasks.
- Scheduling and coordinating the inspection and maintenance of equipment related to managing falls e.g. safety harnesses, anchorage points.
- Addressing the risks associated with falls from heights in site inductions.
- Ensuring all workers are familiarised with the relevant parts of this SOP.

- Ensuring that emergency rescue plans are in place for all tasks where there is a risk of a fall.
- Ensuring the tasks address by this SOP are carried out under competent supervision.
- Documenting and retaining records of equipment inspections both on site and within TRIM.
- Ensuring only permit trained and competent people carry out tasks where there is a risk of a fall.
- Educating workers in the work at heights permit system and the risk of falls.
- Ensuring records and registers of equipment and inspections are held on site and within TRIM.

5.4 WORKERS

All workers shall ensure that they:

- Follow the requirements of this SOP in their respective work areas.
- Report all onsite hazards to the QUU call centre;
- Are active in the identification, reporting and management of fall hazards and related controls in their work area(s).
- Carry with them evidence that they have completed the appropriate working at heights training when involved in work at heights tasks.
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- Seek advice from supervisors regarding the context of risk controls being implemented for the workplace task.

5.5 CONTRACTORS

At all times when performing work on a QUU site or for/on behalf of QUU, contractors must meet and comply with QUU's management requirements detailed in this and related procedures. This includes:

- Providing adequate resources to ensure implementation of the requirements of this SOP in a timely and effective manner in all areas where work is undertaken.
- Complying with this SOP and all relevant legislation, codes of practice, standards and licensing requirements that apply to their respective scope of work.
- Report all incidents to the QUU Project Manager.

5.6 VISITORS

Visitors shall complete a visitors induction and be accompanied at all times when on QUU sites. Whilst on a QUU site, all visitors shall ensure that they follow the site-specific risk of falls management requirements.

5.7 QUU SAFETY TEAM

QUU Safety Team will work with the business to ensure:

- The establishment, review and continual improvement of management systems, arrangements and procedures related to managing the risk of falls.
- The provision of advice to assist in the active management and resolution of identified risks of falls in accordance with QUU SMS and relevant legislative requirements.

6. RELATED DOCUMENTS

- **SWMS3 Working at Heights**
- **WHS Emergency Response and Preparedness Procedure (PRO365)**
- **WHS Communication and Consultation Procedure (PRO361)**
- **WHS Hazard and Risk Management Procedure (PRO363)**
- **WHS Incident Reporting, Investigation and Escalation Procedure (PRO364)**
- **WHS Audit and Inspection Procedure (PRO366)**
- PICOW Handbook MAN 53

- **Hazardous Chemicals SOP (PRO377)**
- Safety by Design SOP PRO521
- Permit to Work SOP STD 76
- Confined Spaces SOP PRO444
- **Traffic Management SOP (PRO410)**
- **Plant SOP (PRO386)**
- Electrical Safety SOP PRO450
- Lock Out / Tag Out SOP PRO379
- Building and Site Evacuation – Emergency and Evacuation Procedure Manual
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- Ladder register template REG42

7. PROCEDURE

QUU will take action to manage their facilities, plant, work environment and tasks as to eliminate the risk of falls at their worksites, and if that is not possible, QUU will minimise the risks so far as is reasonably practicable. Examples of tasks and locations at QUU worksites that may present a risk of a fall include;

- Access and rescue within confined spaces;
- Accessing fixed structures within QUU worksites;
- Work in and above inspection/maintenance holes of water and sewerage main;
- Construction of new facilities such as sewer tunnels;
- Accessing reservoir roof tops;
- Working above water bodies such as settling ponds;
- Accessing which also includes standing on mobile plant.

To manage the risk of a fall at their worksites, QUU will:

- Identify and assess the risk for all locations and tasks that could cause injury due to a fall;
- Supply and maintain suitable plant and equipment for workers to reduce the likelihood of a fall;
- Train workers in the safe use of equipment and plant relevant to their tasks;
- Educate workers in the risks and controls required for managing falls;
- Develop and test emergency response, rescue and first aid plans.

7.1 RISK ASSESSMENT

A risk assessment shall be conducted prior to undertaking all working at heights activities.. The risk assessment shall be conducted in accordance with **WHS Hazard & Risk Management PRO363**.

The risk assessment must be documented in the General Risk Assessment) AND one of the following:

- **Working at Heights Safe Work Method Statement (SWMS3)**;
- Generic risk assessment for multiple tasks and locations provided the fall hazards and risks are the same.

Workers and other affected stakeholders such as contractors, land owners shall be consulted during the risk assessment process. Consultation shall be conducted in accordance with QUU Procedures **WHS Consultation & Communication PRO361**.

Risk assessments shall consider the requirements of this SOP and the Queensland *Managing the risk of falls at workplaces Code of Practice 2011*. A summary of potential hazards to consider during the risk assessment is provided in Table 1.

Table 1: Common Fall Hazards

Potential Fall Hazards to be Considered During Risk Assessment	
Accessing areas of mobile or fixed plant without edge protection	Access and egress to locations from which someone could fall
Adverse weather	Unprotected edges
Workers suspended in a harness after a fall	Working at height above water
Fragile work surfaces e.g. sunlights	Openings or holes in floors/ roof tops
Worker competencies	Inadequate lighting
Mezzanine floors (may have unprotected edges)	Condition of work surfaces (i.e. stability, slipperiness)
The "pendulum effect"	Contractors and visitors
Tools/ equipment being used above people/ equipment	Anchorage point condition and structural integrity
Access and egress to plant and structures e.g. vehicles, building roofs	Using fall protection equipment e.g. harnesses and lanyards
Operating temporary work platforms e.g. EWPs	Roofing materials containing asbestos
Using ladders	Suitability of lighting for work tasks
Accessing scaffolding	

7.2

7.3 HIERARCHY OF CONTROLS

In developing a safe system of work, the following hierarchy of controls for managing the risks of falls shall be followed, with preference given to higher order controls whenever reasonably practicable. When required, a combination of controls shall be utilised e.g. PPE along with use of a temporary work platform:

- **Prevent the fall**: Carry out the task on the ground to eliminate the risk of a fall, or if this is not practicable;
- **Prevent the fall**: Carry out the task on a solid construction, or if this is not practicable;
- **Minimise the risk of a fall:** Provide and maintain a safe system of work by using:
    - **A passive fall prevention** device such as a temporary work platform, scissor lift, cherry picker, roof safety mesh or guard-railing shall be used (refer to section 7.3.3, 7.3.4, 7.3.5), or if this is not practicable;
    - **A work positioning system** such as industrial rope access and travel restraint systems shall be used (refer to section 7.3.6), or if this is not practicable;
    - **A fall injury prevention system** such as, catch platforms and individual fall arrest systems shall be used (refer to section 7.3.7), or if this is not practicable;
    - **A fixed or portable ladder**, or an administrative control shall be used (refer to section 7.3.10).

Note: Appendix A provides an illustration of the hierarchy of controls for managing the risks of falls.

7.4 WORK ON THE GROUND

Eliminating the need to work at height is the most effective way of protecting workers from the risk of falls. When conducting a risk assessment, preference must be given to conducting the task at ground level when it is reasonable practicable.

7.5 WORK ON A SOLID CONSTRUCTION

Where tasks cannot be undertaken from the ground, working on a solid construction is required as it provides an environment where the likelihood of a fall may be eliminated. 'Solid construction' means an area that:

- Is structurally capable of supporting workers, material and any other loads applied to it;
- Is provided with barriers around its perimeter and around any openings from or through which a person could fall;
- Has an even, accessible surface and gradient;
- Has a safe means of entry and exit.

Design of edge protection, access and egress structures must meet the requirements of the *Managing the Risk of Falls at Workplace Code of Practice 2011* and *AS 1657: Fixed platforms, walkways, stairways and ladders – Design, construction and installation*.

7.6 TEMPORARY WORK PLATFORMS

If the risk assessment determines that certain controls cannot be utilised for all or part of the task, temporary work platforms shall be used if reasonably practicable.

A 'temporary work platform' is a working platform, other than a permanently installed fixed platform, used to provide a working area for the duration of the job. The risk assessment will assess which type of temporary platform is most suitable for the task and work location.

Temporary work platforms include:

Scaffolds;

- Fabricated frame scaffolds are the most common type of scaffold because they are versatile, economical, and easy to use. They are frequently used in one or two tiers by residential contractors, painters, etc., but their modular frames can also be stacked several stories high for use on large-scale construction jobs.
- Mobile scaffolds are a type of supported scaffold set on wheels or casters. They are designed to be easily moved and are commonly used for things like painting and plastering, where workers must frequently change position.

Requirements for use of scaffolding on QUU sites includes:

- Scaffolding on QUU worksite must be installed and inspected by a competent person.
- Scaffolding will be inspected before use, after any incident that could affect its stability (such as a severe storm), after any repairs, and at least every 30 days.
- Unauthorised access to scaffolding must be prevented on scaffolding that is incomplete and left unattended (for example, by attaching danger tags and warning signs at appropriate locations).
- Safe access to and egress from the scaffold must be provided.
- Edge protection (hand rails, mid-rails and toe boards) is provided at every open edge of a work platform.

Scaffolds must comply with the Australian/New Zealand Standards AS/NZS 1576 2010 Scaffolding and AS/NZS 4576 – Guidelines for scaffolding.

Elevating work platforms (EWP) consist of a platform surrounded by an edge protection system.

EWPs are a telescoping device, hinged device or articulated device, or any combination of these devices, which is used to support a platform on which personnel, equipment and materials can be elevated to perform work.

EWPs can provide superior reach and versatility to access more awkward areas quickly and effectively. They do not need to be placed right next to the job task in order to gain access and in some cases can be driven over poor terrain conditions.

Requirements for use of EWPs on QUU sites include:

- EWPs shall not be used for access and egress to work areas.
- Workers required to operate EWP shall be trained and competent to do so.
- Use of safety harnesses and lanyards shall be applied as per manufacturer's requirements.

- Operators of boom-type elevating work platforms with a boom length of 11 metres or more shall be licensed (refer to section 7.9).

Lift boxes/ Crane Workboxes that consist of a platform surrounded by an edge protection system, which is designed to be suspended from a crane (refer to **Plant SOP (PRO386)** for Registration of Design requirements and safe operation).

Lift boxes are designed to lift or move people, equipment or materials e.g. access top of structures during construction. Lift boxes generally do not provide a level of safety equivalent to scaffolding and EWPs.

Requirements for use of lift boxes / crane workboxes on QUU sites include:

- Use of safety harnesses and lanyards shall be applied as per manufacturer's requirements;
- The workbox is not to be suspended over persons;
- The workbox is designed for the task;
- The workbox is fitted with a suitable anchorage capable of withstanding the fall forces specified in AS/NZS 1891.4 Industrial fall-arrest systems and devices—Selection, use and maintenance;
- Workers are attached using safety harnesses and lanyards;
- The crane is suitably stabilised at all times while the workbox is used;
- The crane has 'drive up' and 'drive-down' controls on both the hoisting and luffing motions and those controls are used. No declutching allowing free fall is to be used while a workbox is in use;
- Workers do not exit a suspended workbox;
- At least one person in the workbox has a Dogger competency;
- The crane is fitted with a safety hook and moused (lashed) accordingly;
- The operator remains at the controls of the crane at all times.

For specifications for the use of crane workboxes refer to AS 2550.1 Cranes, Hoists and Winches—Safe Use—General Requirements.

Work boxes are secured to a forklift to provide access to a working area for short duration and occasional usage e.g. minor maintenance tasks.

Requirements for use of work boxes on QUU sites include:

- Workers must remain in the work box at all times, wearing a safety harness and lanyard assembly;
- People are not raised on the tynes of forklift trucks or the pallet;
- No other device (for example, ladder or pallets) is used to gain additional height;
- The safety gate is self-locking and kept shut when in the elevated position.

7.7 PERIMETER GUARD RAILS/ EDGE PROTECTION

When workers are required to perform work in locations with exposed edges, measures shall be taken to install suitable edge protection to prevent access to exposed edges. Guard rails shall be applied where a person is at risk of falling, for example;

- At the edges of roofs;
- At the edges of mezzanine floors, walkways, stairways, ramps and landings;
- On top of plant and structures where access is required (tanker vehicles, inspection platforms);
- Around openings in floor and roof structures;
- Above water e.g. flotation ponds;
- At the edges of settling ponds that are above ground, shafts, pits and other excavations.

Edge protection shall be installed regardless of the distance that a person or object may fall, if the risk assessment determines that any fall could have serious harmful or dangerous consequences.

Before using a guard rail system, it must be checked to verify that it will be adequate for the potential loads. The required load resistance will depend on the momentum of a falling person. For example, the momentum of a person falling from a pitched roof will increase as the pitch of the roof increases.

Edge protection for permanent structures/ plant must meet the requirements of AS 1657: Fixed platforms, walkways, stairways and ladders – Design, construction and installation.

Guard rails must incorporate a top rail 900mm to 1100mm above the working surface and a mid-rail and a toe board. *Refer to AS/NZS 4994—Temporary Edge Protection series for further guidance.*

7.8 SAFETY MESH

Safety mesh is designed to prevent internal falls through a roof. If securely fixed, safety mesh provides fall protection for roof installers and offers long-term protection against falling for maintenance and repair workers. The risk assessment for use of safety mesh must include and meet the following requirements;

- Use of edge protection if there are exposed edges;
- Compliant with AS/NZS 4389 Safety Mesh;
- Competent persons used for installation of the mesh.

7.9 WORK POSITIONING SYSTEMS

Where it is not practicable to work at heights from a work platform, a work positioning system must be considered. A work positioning system involves the use of equipment that enables a person to work supported in a harness in tension in such a way that a fall is prevented.

Work positioning systems require a high level of competency on the part of the user and supervisors to ensure safe use. Users, including supervisors, must undertake a competency based course of training (refer to section 7.21).

7.10 INDUSTRIAL ROPE ACCESS SYSTEMS

Industrial rope access systems are used for gaining access to and working at a workface, usually by means of vertically suspended ropes.

Due to the high level of training and skill involved with the use of industrial rope access systems, it is only considered practical for specialised personnel specifically trained in its use, e.g. emergency rescue personnel.

Requirements for use of these systems on QUU sites include:

- Exclusion zones established around the work area;
- Workers are trained and competent;
- A back up system is used to protect the operator;
- Two independently anchored ropes are used for each person;
- Any person within three metres of an unguarded edge is adequately secured;
- All operators wear a full body harness;
- Supervisors can communicate with workers;
- Where necessary, appropriate personal protective equipment is used, such as helmets, gloves, hearing protection, goggles and masks;
- Barricades and signposts are placed on all access areas below the working area and anchorage locations to exclude and alert the public and tradespeople.

Guidance on the use of industrial rope access systems is available in *AS/NZS 4488 (series) – Industrial rope access systems*.

7.11 RESTRAINT TECHNIQUE

A restraint technique controls a person's movement by physically preventing the person reaching a position at which there is a risk of a fall. This type of system is less desirable than previous measures

detailed such as installation of physical barriers but is preferred over those that arrest a person after they have fallen.

Common QUU fall restraint systems compromise:

- Anchorage point(s);
- A static line or restraint line of appropriate strength and length;
- A harness or restraint belt.

A restraint system shall be set up to comply with the following;

- The user can maintain secure footing (consider the slope of the surface, surface texture, whether it is wet/slippery etc.);
- The work surface is sufficiently strong to support the worker;
- The worker cannot reach an exposed edge;
- Shall be installed by a competent person;
- Users shall be trained in safe operating requirements and safety equipment;

Guidance in the use of industrial rope access systems is available in *AS/NZS 1891Industrial fall arrest systems and devices.*

7.12 INDIVIDUAL FALL-ARREST SYSTEMS

Where a higher level of control is not practicable or possible, a fall-arrest system must be considered. Fall-arrest systems may also be used to supplement a higher level of control if the higher levels are not fully effective in preventing a fall on their own.

If any of the following situations apply then a fall-arrest system shall be used:

- The user can reach a position where a fall over an edge is possible;
- The user has a restraint line that can be adjusted in length such that a free fall position can be reached;
- The slope is over 15 degrees;
- There is a danger of the user falling through the surface (i.e. roofing material).

Prior to undertaking work using fall arrest equipment, verify through inspection that there are no obstructions in the potential fall path.

Key requirements regarding fall-arrest systems must be;

- Inspected prior to use, with defective equipment tagged out of service.
- Installed so that the maximum distance a person would free fall before the fall-arrest system takes effect is 2m.
- Sufficient distance between the work surface and any surface below to enable the system, including the action of any shock absorber to fully deploy. To work out whether there is enough distance available, you must as part of a risk assessment take into account:
    - The worker's height;
    - The height and position of the anchorage point;
    - The length of the lanyard;
    - Any slack in the horizontal life line;
    - Any stretching of the lanyard or horizontal life line when extended by a fall;
    - The length of the energy absorber when extended by a fall.
- A shock absorbing lanyard shall be attached to the harness. Lanyards must not be used in conjunction with inertia reels as this can result in an excessive amount of free fall prior to the fall being arrested.

- A full body harness must be worn.
- Maintain minimum of slack in fall-arrest lanyard.
- Safe use of inertia reels.
- Use compatible components to minimise risk of 'roll-out' of karabiners and attachment devices.
- Under no circumstances is fall arrest equipment to be anchored to scaffolding, handrails or other structures not designed and approved to withstand 15 KN of force.
- Persons using a fall arrest system will not work alone.

Fall-arrest systems must comply with the AS/NZS 1891 (series) Industrial fall arrest systems and devices of standards.

The Pendulum Effect: Assessment of the work task must be made to manage the potential for workers to strike the ground or structures in the event of a fall resulting from the 'pendulum effect'. The pendulum effect can be avoided by making sure that the inertia reel's anchorage point is more or less perpendicular to the line's position at the perimeter edge. A mobile anchorage is of assistance here. In some circumstances it may be necessary to use side guard railing in conjunction with the use of individual fall arrest systems in order to ensure that the pendulum effect is avoided at both the side and leading edges.

7.13 ANCHORAGE POINTS

Competent personnel shall be engaged for designing, selecting and/or installing all anchorage points.

Each anchorage point must comply with the requirements in AS/NZS 1891:4 Industrial fall-arrest systems and devices – selection, use and maintenance. Key requirements regarding anchorage points include:

- Must have a minimum breaking strength of 15 kN – for use by one person.
- If 2 people are attached to the same anchorage point then the minimum breaking strength for the anchorage point is 21 kN.
- The maximum number of persons connected to any one point shall be two.
- Tested and approved by a competent person before use. Where welding processes are used in designing anchor points all welds will be 100% magnetic particle tested on installation.
- Anchorage points for fall-arrest devices must be where practical, above the head of the worker, to ensure that in the event of a fall the worker will neither swing nor touch the ground.
- Each anchorage point must be located so that a lanyard of the system can be attached to it before the person using the system moves into a position where the person could fall.
- Each component of the system and its attachment to an anchorage must be inspected by a competent person:
    - After it is installed but before it is used;
    - At regular intervals;
    - Immediately after it has been used to arrest a fall.

7.14 ANCHORAGE LINES OR RAILS

Anchorage lines or rails are temporary or permanent fall-arrest systems, which can be installed to provide continuous fall protection for persons using ladders or climbing towers.

If anchorage lines or rails are not suitable, then double lanyards can be used. Training in the correct technique must be provided to workers.

Temporary systems must comply with the AS/NZS 1891 series of standards

7.15 LADDERS

Portable Ladders

Due to the potential risk of injury, the use of ladders is the last level in the hierarchy of controls for fall prevention and should only be used where the higher order controls are not practicable. The safe use of portable ladders must include but not limited to the follow;

- Extension or single ladders should generally only be used as a means of access to or egress from a work area. They should only be used as a working platform for light work of short duration that can be carried out safely on the ladder.
- Must have a load rating of at least 120 kg and be manufactured for industrial use.
- If a person uses either a single or an extension ladder then the person must ensure that the ladder is placed with a slope of 4:1, so that the distance from ladder base to the base of the support is one quarter of the working length of the ladder.
- Ladders must be situated on firm footing and secured to prevent movement.
- Where a ladder is used to gain access to a working platform or roof then the top of the ladder will extend beyond the platform or roof a distance of not less than 1 metre.
- Metal ladders and timber ladders with wire reinforcing will not be used where an electrical hazard exists.
- All ladders will be inspected prior to use and only used if in good condition.
- Ladders will be marked for identification purposes. Ladders found without a legible identification mark are to be removed from service until inspected and approved for further use.
- A ladder register must be maintained for each work site and this must include the date of the last inspection.
- Materials or tools are not carried while climbing the ladder – use a tool belt or side pouch

Guidance on the selection, safe use and care of portable ladders is set out in AS/NZS 1892 Portable ladders series. The manufacturer's recommendations on safe use must also be followed.

Fixed Ladders

- Fixed ladders must be installed in accordance with AS 1657 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation.
- Fixed ladders with angles exceeding 75 degrees to the horizontal must be fitted with a permanent or temporary fall-arrest system (anchorage lines or rails).
- A specifically designed rescue procedure must be developed for use in ladder cage situations.

Ladder Maintenance

Ladders must be regularly inspected by the Health and Safety Representative in accordance with QUU **WHS Audit and Inspection Procedure (PRO366)**.

7.16 PPE AND ATTACHMENT HARDWARE REQUIREMENTS

Requirements and specifications for attachment hardware for attaching lanyards to harnesses must meet the following requirements:

- Comply with the AS/NZS 1891 (series) Industrial fall arrest systems and devices of standards.
- Rings must be secured so that:
    - Load-bearing webbing passes through the ring, and in the case of a D-ring, it is secured on the straight bar of the ring; and
    - The assembly is capable of taking the full load of an arrested fall.
- Snap hooks and karabiners must be self-closing and self- or manual locking.
- The springs will be loaded so that when the latches are closed the springs rest in position, and are constrained from any movement until deliberate pressure is applied to engage or release the latch.
- In order to reduce the probability of involuntary opening, snap hooks and karabiners will be capable of being opened by at least two consecutive deliberate actions.
- Attachment hardware must be designed to withstand a load of 15 KN without permanent distortion.

- When making any attachment to a point on a harness which cannot be seen by the wearer, the attachment must be made before putting the harness on or alternatively should be made or checked for security by a second person.
- An approved safety harness for use is a full body harness with a single lifeline at the top dorsal position. The harness will routinely inspected and carry a current Australian Standard tag (AS 1891.4).
- All harnesses and fall prevention equipment must be used and maintained in accordance with the manufacturer's instructions

7.17 FALL-ARREST EQUIPMENT INSPECTION REQUIREMENTS

Every approved Safety Harness, Personal and Temporary Restraint Lanyard, Temporary Safety line, Anchorage Point or other item of fall prevention equipment will be inspected and tagged by competent person.

Table 2 provides a summary of Inspection Requirements for fall-arrest equipment (for further details refer to AS 1891.4).

Table 2: Fall-arrest Equipment Inspection Summary

Pre-use inspection by equipment user
Fall arrest devices - external check only Harnesses: • Buckles – look for cracks, bent buckles & smooth operation • Webbing – look for frayed, cracked, burnt, contaminated or otherwise damaged webbing (loose stitching for example) • D-rings – look for cracks, bent D-rings Lanyards: • Snap hooks – look for cracks, bent buckles, double action • Rope or Webbing – look for frayed, burnt, or otherwise damaged rope / webbing or evidence of partial deployment Inertia reels: • Snap hooks – look for cracks, bent buckles, double action • Fully extract the webbing or wire and check for damage • Check for anchorage of the webbing or wire to the drum when it is fully extended • Secure locking and holding of locking mechanism when the rope is given a sharp tug • Free running through the anchorage with no tendency to stick or bind
3 monthly inspections by a competent person
Fall arrest devices - external check only.
6 monthly inspections by Height Safety equipment inspector
Belts; Harnesses; Lanyard assemblies; and Associated personal equipment
12 month inspection/service by Height Safety equipment inspector
Permanently installed anchorages.

Fall-arrest devices – full service including dismantling where indicated. Fixed Horizontal lifelines and rails, including integral components and permanently installed mobile attachment devices.

Equipment deemed fit for use will be fitted with a coloured tag by the competent inspector. The colour of the tag used will be based on the inspection period as detailed in Table 3 below.

Table 3: Working at heights equipment inspection colour codes

Quarter	Period	Colour
Q1	January – March	Red
Q2	April – June	Green
Q3	July – September	Blue
Q4	October - December	Yellow
A transition period of ± 2 weeks is permitted between inspection periods		

Harnesses, lanyards and associated equipment shall be removed from service and tagged out under the following conditions;

- After 10 years from the manufacture date in accordance with the manufacturer's instructions;
- If a current coloured tag is not fitted to the item;
- There is no legible serial number;
- If it is defective or has been used in a fall arrest situation to prevent it being used until it is destroyed.

Arrange a replacement unit through your supervisor.

7.18 EXCLUSION ZONES

Exclusion zones or 'no go' areas, are required to be established where people may be exposed to hazards from overhead work, or hazardous areas (such as unprotected edges).

QUU will develop and implement procedures to ensure that the risk of objects falling onto or hitting workers and/or people in adjoining areas is as low as reasonably practicable. Adjoining areas may include public footpaths, roads, yards of nearby dwellings, or any other building beside a workplace.

Where overhead work is being performed and there is a risk of equipment, materials and tools falling from the elevated position, an appropriate drop zone must be established at exposed lower levels. When establishing a drop zone, the following must be considered:

- Location of the overhead work;
- Height of the work above the lower level;
- The possible deflection of falling objects by structures, pipes or equipment in the area;
- Number of levels to barricade.

Barricades, barriers and signage must be used to demarcate drop zones and hazardous areas. They must be highly visible and securely fixed to prevent displacement. Hazard tape is not acceptable as a visual warning device where the potential to fall exists, in this case Para-webbing or bunting positioned, secured and adequately supported at least 2m from the edge of the hazard may be utilised.

Tool lanyards must be used where possible to further protect personnel from objects dropped / dislodged by personnel working from heights.

7.19 PURCHASING AND HIRE OF PLANT AND EQUIPMENT

Purchasing and rental of equipment used to manage the risk of falls is to be conducted in accordance with QUU **Plant SOP (PRO386)**.

7.20 EMERGENCY RESPONSE PREPAREDNESS & PLANNING

Site plans for the emergency response, first aid and rescue of personnel who are at risk of a fall must be in place.

Rescue plans for personnel engaged in the following tasks must be in place prior to commencing the task;

- Working from temporary work platforms;
- Using fall-restraint or fall-arrest equipment.

The following aspects must be considered when developing emergency procedures for falls;

- Location of the work area;
- Communications;
- Rescue equipment;
- Capabilities of rescuers (based on risk, rehearsal of rescue scenarios may be required);
- First aid;
- Location of emergency services.

Emergency response equipment must be:

- Consistent with the requirements of the rescue plan;
- Readily available;
- Maintained and used in accordance with manufacturer's instructions;
- Discussed with and understood by all work members involved in the working at heights task. These emergency plans must be attached to the Work at Heights Permit (TBA).

Suspension Intolerance: Measures must be taken to prevent suspension intolerance in the event of a worker falling and being suspended in a harness. Required controls include;

- Workers never work alone when using a harness as fall protection;
- The time a worker spends in suspension after a fall is limited to less than five minutes. When a suspension is longer than five minutes, foothold straps or a way of placing weight on the legs must be provided;
- Workers are trained to do the following when they are hanging in their harness after a fall:
    - Move their legs in the harness and push against any footholds, where these movements are possible. In some instances, the harness design and/or any injuries received may prevent this movement;
    - Move their legs as high as possible and the head as horizontal as possible, where these movements are possible.

7.21 COMPETENCY

Training and competency is to be undertaken in accordance with the QUU Training System **WHS Training and Competence PRO360** and a record of training and/ or assessment(s) completed must be kept.

Personnel will receive instruction and training in emergency and rescue procedures and in the use of rescue equipment.

Personnel who conduct work at heights must be trained in the task or tasks applicable to their role. The competencies (or recognised equivalents) listed in Table 4 are applicable to personnel involved in working at heights.

Refresher training for all personnel is required and intervals must not exceed two years.

Table 4: Training and competency requirements

Task	Competency or licence code
Conduct Work at Heights	Managing Risk of Falls SOP
	RIIOHS402A – Work Safely at Heights
	Permit to Work Overview
Supervise Work at Heights	Managing Risk of Falls SOP
	Permit to Work Overview
Elevated Work Platform Operation	WP- Boom type elevating work platform (>11meter boom length) High risk work licence
	Managing Risk of Falls SOP
	RIIOHS402A – Work Safely at Heights
	Permit to Work Overview
Height Safety Equipment Inspector	RIIOHS402A – Work Safely at Heights
Dogging	DG – Dogging High Risk Work license
Basic rigger	RB – Basic rigger High Risk Work license
Intermediate Rigging	RI – Intermediate Rigging High Risk Work license
Advanced rigger	RA – Advanced rigger High Risk Work license
Scaffolding Basic	SB – Scaffolding Basic High Risk Work license
Scaffolding Intermediate	SI – Scaffolding Intermediate High Risk Work license
Scaffolding Advanced.	SA – Scaffolding Advanced High Risk Work license

7.22 RECORDS

Applicable documentation and records related to the management of falls must be kept in TRIM with physical hard-copies held on site in a manner easily accessible for audit and review at each work site or facility.

This requirement applies to the following documents, where applicable:

- Working at Height Permits prepared and verified by authorised persons;
- Associated safety documents, permits, risk assessments, SWMS;
- Working at Heights training and competency records;
- Registers, inspection data and maintenance records, including NATA certificates for all working at heights safety equipment
- Inspection and/or audit results and a record of the subsequent actions required.

8. REFERENCES

The following references contain information used in the preparation and development of this Managing the Risk of Falls SOP:

- Queensland Work Health and Safety Act 2011
- Queensland Work Health and Safety Regulations 2011
- Managing the risk of falls at workplaces Code of Practice 2011
- How to Manage Work Health and Safety Risks Code of Practice 2011
- Work Health and Safety Consultation, Co-operation and Co-ordination Code of Practice 2011
- Managing Risks of Plant in the Workplace Code of Practice 2013

- Scaffolding Code of Practice 2009
- Mobile crane code of practice 2006
- AS 1891– Industrial fall arrest systems and devices;
- AS 2550 - Cranes, hoists and winches
- AS/NZS 4994 Temporary edge protection series
- AS/NZS 4488 Industrial rope access systems series
- AS/NZS 1892 Portable ladders series
- AS/NZS 1576 Scaffolding series
- AS/NZS 4142.3 Fibre ropes—Man-made fibre rope for static life rescue lines
- AS/NZS 4389 Safety mesh
- AS 1657 – Fixed platforms, walkways, stairways and ladders;

9. REVIEW

The Managing the Risk of Falls SOP is to be reviewed every 2 years or earlier if:

- There is an identified risk to business
- Incident investigation or audit results show that application of the standard fails to deliver the required outcomes
- There are changes in associated legislation
- There is evidence that the standard is not having a positive impact on safety-related KPIs.
- Changes in processes, plant and facilities
- Continuous improvement recommendations

10. FURTHER INFORMATION

For further information, contact your, Health and Safety Representative or the QUU Safety Team.

11. FURTHER INFORMATION

11.1 APPENDIX A: FALLS FROM HEIGHTS RISK METHODOLOGY