

Procedure

Corporate Safety - WHS Prevention of Falls Procedure

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Contents

1	Purpose	3
2	Scope	3
3	Definitions	3
4	Roles and Responsibilities	6
5	Procedure	7
5.1	Principles for managing falls	7
5.2	Grid mesh, flooring and guardrail removal	8
5.3	Managing the risks of falls	8
5.4	Selection of fall risk controls	9
5.5	Eliminating the need to work at height	10
5.6	Passive fall protection devices	13
5.7	Fall restraint systems	16
5.8	Work positioning systems	18
5.9	Fall injury prevention devices	19
5.10	Portable ladders	21
5.11	Anchorage points	23
5.12	Administrative controls	24
5.13	Inspection, maintenance and storage of fall protection system equipment	26
5.14	Radio frequency communications equipment	28
5.15	Emergency procedures	28
6	Training requirements	29
7	References	29
7.1	Legal and other requirements	29
7.2	Legal and other requirements	30
7.3	Legal and other requirements	30
	Appendix A – Grid mesh, flooring and guard rail removal process	31
	Appendix B – Specific requirements for access and egress structures	34
	Appendix C – Examples of common controls for prevention of falls	37

1 Purpose

Seqwater is committed to the health and safety of all people at the workplace. The purpose of this procedure is to promote safe work practices when working around unprotected edges and to prevent incidents involving falls at Seqwater workplaces.

This procedure adopts and is consistent with the requirements outlined in:

- Work Health and Safety Act 2011 (Qld)
- Work Health and Safety Regulation 2011 (Qld)
- Managing the Risk of Falls at Workplaces Code of Practice 2011 (Qld).

2 Scope

This procedure applies to all Seqwater workers, business groups and work activities.

3 Definitions

Term	Definitions
Competent Person	Means a person who has acquired through training, qualification or experience the knowledge and skills to safely and effectively carry out the task.
Davit	A crane like device, usually one of a pair, fitted with a tackle for suspending or lowering equipment or workers.
Drop Zone	Area below or adjacent to the work area where objects could fall or be directed into if they strike other structures after they fall.
Fall	A fall by a person from one level to another.
Flooring/Grid Mesh Panel	Any section of trafficable flooring, walkway, platform (grid mesh, checker plate, pit covers (hinged or otherwise)), steps or ladder rungs. A grid mesh panel can be used in the construction of walkways or platforms, including metal or fibre reinforced plastic panels.
Guard Rail	A structure to prevent persons from falling off any platform, walkway or landing.
Hazard	A situation that has the potential to harm a person and/or the environment and/or damage property.
Height safety equipment	All equipment used to control fall risks whilst undertaking work at height.

Term	Definitions
Hierarchy of controls	<p>Identify the risk control actions and responsibilities by identifying controls in the following specific order:</p> <ul style="list-style-type: none"> eliminate the hazard. <p>If elimination of the hazard is not reasonably practicable, minimise the risk so far as reasonably practicable by:</p> <ul style="list-style-type: none"> substituting (wholly or partly) the hazard giving rise to the risk with something that gives rise to a lesser risk isolating the hazard from any person exposed to it implementing engineering controls. <p>If a risk then remains, then minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls.</p> <p>If a risk then remains, then minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable Personal Protective Equipment (PPE).</p>
Job Safety and Environment Analysis (JSEA)	A step-by-step method of identifying hazards, evaluating the risk, implementing control measures and providing a safe system of work.
Line Supervisor	A Line Supervisor is a person with day-to-day supervisory responsibilities for workers within a functional area of the business. A Line Supervisor includes, but is not limited to, Team Leaders, Coordinators and Level 4 or 5 Supervisors. A Line Supervisor is also considered a worker, but has additional responsibilities for the implementation of the WHS Management System as identified in the WHS Management System and/or position description.
Manager	A person with the responsibilities for managing a functional area of the business including the workers within the relevant functional area. This includes, but is not limited to, Level 3 Managers, General Managers and Project Managers. A manager is also considered a worker, however managers may have additional responsibilities for implementation of the WHS Management System as well as any additional responsibilities as an officer of the business.
Reasonably practicable	<p>The following criteria must be applied in determining what is reasonably practicable:</p> <ul style="list-style-type: none"> What the person knows or ought to reasonably know about the hazard and ways of eliminating or minimising the hazard Availability and suitability of ways of eliminating or minimising the hazard The cost associated with the availability and suitability of ways of eliminating or minimising the hazard, taking into account the cost if it is grossly disproportionate to the risk.
Removal of grid mesh, flooring or guardrail	To completely or partially remove or displace an item of grid mesh, flooring or guard railing to create an opening through or leading edge from which someone or something could fall.
Risk	Risk is the likelihood and consequence of injury or harm occurring when exposed to a hazard.
Risk control	Means taking action to eliminate health and safety risks so far as is reasonably practicable, and if that is not possible, minimising the risks so far as is reasonably practicable. Eliminating a hazard will also eliminate any risks associated with that hazard.

Term	Definitions
Risk of a Fall	<p>Means 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:</p> <ul style="list-style-type: none"> • 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 • on or near the vicinity of a slippery, sloping or unstable surface.
Training Needs Analysis (TNA)	The identification of all training needs required by workers at Seqwater.
Unprotected Edge	A drop off or fall from any height created by the removal or modification of an existing structure which is used to prevent exposure to an unprotected edge, such as removal of flooring, guard rail, hatches, pit covers or manholes.
Work at Height	Work at height is any work activity undertaken in a location where, if a worker was to fall, an injury is likely to occur. Generally, any work performed at a height of two metres or greater is considered to be likely to injure a worker should they fall. However, work at lesser heights in circumstances such as a windy location, or a sloping, slippery or uneven surface may also involve a fall risk for workers and are considered to be work at height.
Worker	<p>Worker means a person who carries out work in any capacity for Seqwater, including work as:</p> <ul style="list-style-type: none"> • an employee • a contractor or subcontractor • an employee of a contractor or subcontractor • an employee of a labour hire company who has been assigned to work at Seqwater • an outworker • an apprentice or trainee • a student gaining work experience • a volunteer • a worker of a prescribed class.
Workplace	A place where work is carried out by Seqwater and includes any place where a worker goes, or is likely to be, while at work. This includes a vehicle, vessel or other mobile structure.

4 Roles and Responsibilities

Role	Responsibility
Managers	<ul style="list-style-type: none"> Establish processes to ensure all reasonably foreseeable hazards that could give rise to the risk of falls are identified in their area of responsibility, with effective control measures implemented to eliminate these risks wherever practicable, or otherwise to minimise the risks so far as is reasonably practicable. Provide communication, supervision, instruction, and access to training in the management of fall risks. Ensure the site WHS hazard registers includes fall risks located at their workplaces.
Line Supervisors	<ul style="list-style-type: none"> Ensure hazards associated with the falls are assessed and managed in consultation with workers and/or health and safety representatives. Implement and regularly review controls to mitigate the risks of falls. Provide workers with appropriate fall protection equipment and ensure they are correctly used and maintained as required. Ensure a Job Safety and Environment Analysis (JSEA) is conducted, and identified controls are implemented, prior to commencing any work activity that exposes a worker to the risk of falling.
Maintenance Coordinator	<ul style="list-style-type: none"> Ensure all statutory plant (including anchorages and other relevant safety equipment required to manage risks associated with falling) at workplaces within their area of responsibility is scheduled in CIS. Ensure all required maintenance, inspection, testing and calibration is undertaken on statutory plant at workplaces within their area of responsibility in accordance with the schedule in CIS.
Tactical Maintenance Planner	<ul style="list-style-type: none"> Develop and implement a maintenance, inspection and testing program for statutory plant (including anchorages and other relevant safety equipment required to manage risks associated with falling) to meet regulatory requirements. Ensure that all registrable plant is registered in accordance with the requirements of the <i>Work Health and Safety Regulation 2011</i> (Qld).
HSW Team	<ul style="list-style-type: none"> Provide advice, support and consultation on managing the hazards and risks of falls, including identification and implementation of effective risk controls.
Workers	<ul style="list-style-type: none"> Follow any instructions in relation to managing falls. Complete a Work at Height Permit (FRM-00414) for all work activities where a worker is likely to be injured as a result of a fall. Conduct a JSEA and implement risk control measures prior to commencing any work where there is a risk of falls. Wear and maintain personal protective equipment (PPE). Comply with PPE signage requirements. Undertake relevant WHS training where identified in the WHS Training Needs Analysis. Report hazards, risks or incidents in relation to falls to the Seqwater Incident Hotline (07) 3270 4040 and their line supervisor or manager.

5 Procedure

The risks associated with work activities undertaken at Seqwater workplaces that expose workers to falls must be eliminated wherever reasonably practicable, otherwise the risks of undertaking the activity must be minimised so far as is reasonably practicable.

Workers shall be protected from falls and from fall injuries through the implementation of risk-based controls in accordance with this procedure, other related corporate procedures and legislative requirements.

Many work activities undertaken at Seqwater workplaces have the potential to expose workers to falls and fall injuries unless appropriate risk controls are applied.

Examples of work activities that expose workers to falls include:

- working on reservoirs, roofs and elevated platforms
- working on dam assets and weirs
- working around holes and openings such as pump stations and pits
- working on steep embankments
- removing grid mesh flooring panels
- constructing or using scaffolds
- construction of infrastructure
- working on large mobile equipment
- using ladders
- accessing utility and truck trays and trailers.

5.1 Principles for managing falls

The following principles must be applied for work activities undertaken at Seqwater workplaces that expose workers to the risk of falling:

- Generally, a fall risk exists if a worker can approach within two metres of an unprotected edge or other fall hazard, such as a fragile roof. However, where there are additional risk factors such as a windy location, or a sloping, slippery or uneven surface, a fall risk may exist beyond two metres from an unprotected edge or other fall hazard. Regardless of the distance from an unprotected edge or other fall hazard, a fall risk must be eliminated wherever reasonably practicable, otherwise the risk must be minimised so far as is reasonably practicable.
- A risk assessment must be completed for any work activity that exposes a worker to the risk of falling.
- A Work at Height Permit ([FRM-00414](#)) is required where a work activity is undertaken:
 - at a height of two metres or greater and the work location is not designed for human occupation (i.e. the work location is not fitted with guardrails, ladder cages, etc. that prevent a worker from falling); or
 - at a height of less than two metres where other factors at the work location increase the risk of a worker falling (i.e. weather conditions, sloping, slippery or uneven surfaces); or
 - when utilising working at height access equipment such as elevated work platforms, scaffolding or work boxes.
- A High Risk Work Rescue Plan ([TEM-00027](#)) must be developed and tested where:
 - a worker is using a safety harness to perform the work activity; or
 - a risk assessment for the work activity to be undertaken has a residual risk rating of high or greater.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 7 of 40

5.2 Grid mesh, flooring and guardrail removal

A Grid Mesh, Flooring and Guardrail Permit ([FRM-00412](#)) is required when any grid mesh, flooring or handrail is removed and the removal of the grid mesh, flooring or handrail creates a fall risk to workers or the public.

The process to be used for the safe removal and reinstatement of grid mesh, flooring and guard rails is included in Appendix A of this procedure.

Maintenance or modifications to grid mesh, flooring and guardrails must not be undertaken unless assessed and approved by a suitably qualified engineer.

5.3 Managing the risks of falls

5.3.1 Risk assessment

A risk assessment must be completed for any work activity that exposes a worker to the risk of falling. All risk assessments must be undertaken in accordance with the WHS Hazard Identification and Risk Management Procedure (PRO-00657). This involves the following steps:

- STEP 1 – Hazard identification - identify work locations and activities that could lead to falls.
- STEP 2 – Risk assessment: inherent risk - assess the inherent risks associated with the work location and activity.
- STEP 3 – Control risks - identify and implement risk control measures .
- STEP 4 – Risk assessment with control measures: residual risk - Assess the residual risks associated with these hazards following the implementation of the risk control measures.
- STEP 5 – Monitor and review control measures - review risk control measures.

When undertaking the risk assessment, the following must be considered:

- all potential fall hazards (workers, tools, materials, etc.)
- the frequency and duration of exposure to the hazard
- the consequence of a fall
- environmental conditions which may influence the work activity (i.e. wind, rain, temperature, etc.)
- legislative requirements
- controls that can eliminate or mitigate the hazard in accordance with the hierarchy of controls
- recommended or standard practices applied to similar circumstances at other Seqwater workplaces
- practicability of the available risk controls
- hazard reduction benefits, impacts and costs of available controls.

5.3.2 Hierarchy of controls for managing risks of falls

Where a work process or activity is identified that potentially exposes workers to the risk of falling and fall injuries, risk control measures must be implemented.

The hierarchy of controls must be used to identify the most appropriate risk control measure to manage the risk. The identification and selection of risk control measures must be undertaken in consultation with workers.

The hierarchy of controls ranks the methods of controlling the risk from the highest level of protection and reliability to the lowest so that the most effective controls are considered first.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 8 of 40
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Hierarchy of Controls	Example of possible risk control
Elimination (Highest level)	Eliminate the potential for a fall from the work task (i.e. relocating equipment to ground level).
Substitution	Replace the process, plant or equipment with an alternate (i.e. replacing vertical ladders with stairs).
Isolation	Isolate workers from potential falls by installing a guardrail or grating around a wet well.
Engineering	Design or re-design the process, plant or equipment (i.e. install a ladder climbing system or davit entry to a reservoir).
Administrative	Develop work instructions / JSEAs for undertaking tasks that expose workers to falls. Warning signage.
PPE (Lowest level control)	Hard hat, gloves, safety goggles, protective clothing, harnesses, etc.

The most effective risk control measure is to eliminate the requirement to undertake any work activities that expose workers to risk of falling or from being injured by falling objects.

If it is not reasonably practicable to eliminate the hazardous activity, risk controls must be implemented to minimise the risk as far as is reasonably practicable.

5.3.3 Reviewing risk controls

Once implemented, risk controls for managing fall risks must be monitored and reviewed to ensure they remain effective.

Existing risk controls for managing fall risks must be reviewed:

- if an injury or incident is reported
- when the risk control measure does not control the risk it was implemented to control so far as is reasonably practicable
- before a change at the workplace that is likely to give rise to a new or different risk to health or safety that the control measure may not effectively manage
- if a new relevant hazard or risk is identified
- if the results of consultation indicate that a review is necessary
- where requested by a health and safety representative
- every two years.

The process used for the initial risk assessment (section 4.3.1 of this document) must be used when reviewing existing risk control measures.

5.4 Selection of fall risk controls

In order to determine the most appropriate risk controls to apply to work activities involving fall risks, the following process must be followed:

1. Avoid working at height to complete the task. For example:
 - use extendable tools from the ground instead of using a ladder
 - lowering a lighting mast to ground level
 - ground level assembly or maintenance of plant and equipment.

2. If working at height cannot be avoided, risk controls must be implemented to prevent a fall from occurring. For example:
 - implementing appropriate access and egress arrangements
 - using grid mesh, flooring and handrails
 - using elevated work platforms
 - using scaffolds
 - using fall restraint systems
 - using davit systems
 - using industrial rope systems.
3. If the risk of a fall from height remains, risk controls must be implemented to minimise the distance and/or consequences of a fall. For example:
 - using fall arrest systems, such as harness and shock absorbing lanyard, safety nets, etc.
4. For work activities involving a low level risk of falls or for short duration activities, ladders and step ladders may be used.
5. Administrative controls and PPE must be used for all work activities where there is a risk of falls. For example:
 - signage
 - exclusion zones
 - hardhat, gloves, head protection, safety footwear, etc.

When choosing the most appropriate risk control method, the practicality of implementing the risk control and using the equipment must be considered.

5.5 Eliminating the need to work at height

Where possible, the requirement to undertake work at height should be eliminated. Working at height can be eliminated by either undertaking the work at ground level or undertaking the work from a solid construction.

5.5.1 Performing work at ground level

Performing work at ground level is generally only possible where the physical assets are designed and configured to allow the movement of the asset to be worked on to ground level or the operation of the asset can occur from ground level, for example:

- using extended spindles to operate valves in deep valve pits
- lowering light poles to perform maintenance on light fittings
- assembly and maintenance of plant and equipment at ground level before lifting or lowering into normal positions.

Alternate work methods may also be used to eliminate the need to work at height, including:

- using flexible cameras to inspect equipment in deep pits
- using drones to perform inspections of reservoir roofs
- using remote controlled equipment to perform tasks in dangerous locations.

5.5.2 Performing work on a solid construction

Working on a solid construction provides an environment where the likelihood of a fall can be eliminated.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 10 of 40
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Solid construction means an area that has:

- a surface that is structurally capable of supporting all persons and things that may be located or placed on it
- barriers around its perimeter and any openings to prevent a fall
- an even and readily negotiable surface and gradient
- a safe means of entry and exit.

Examples of solid construction at Seqwater workplaces include:

- a fixed platform surrounding an air valve on an elevated water main
- a fixed platform to maintain an elevated conveyor
- a fixed platform to access weir gauging station assets.

5.5.3 Access and egress arrangements to work areas

Appropriate access and egress arrangements must be implemented where work activities are being undertaken that expose workers to falls from height.

The preferred method of access and egress to a worksite that exposes workers to falls from height, in priority order, is:

1. level walkway
2. sloping walkway
3. stairway
4. fixed inclined ladder
5. fixed vertical ladder
6. portable ladder.

The appropriate access or egress method for a specific work area will depend on the configuration of the work area and the work to be undertaken. Wherever practicable, the method of access and egress that provides the highest level of protection must be used.

The following safety considerations should be addressed when selecting access and egress methods:

- exposure of access systems to the weather (e.g. rain can make surfaces slippery and strong winds can cause loss of hand grip)
- the provision of adequate natural or artificial lighting
- the clearance of obstructions so that workers are able to move easily to and from the workplace.

Further guidance on the selection and configuration of access and egress structures is contained in Appendix B of this procedure and in *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*.

Where none of the access or egress methods listed above are practicable, an alternate access and egress method may be required, such as an industrial rope system or davit system.

Security, public safety and emergency access requirements must be considered when selecting an access and egress method.

5.5.4 Edge protection

Edge protection is a barrier which prevents a worker accessing an open edge or opening where there is a risk of a fall. Edge protection is a key component of fall prevention and is applied extensively throughout Seqwater workplaces.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 11 of 40

Edge protection may be permanent, such as a permanent guardrail around a working platform on a tank, or temporary, such as scaffolding or a portable barrier system.

Edge protection has specific design requirements which must be considered for all new assets or for alterations to existing assets.

Guardrails

Guardrails usually consist of a handrail, a midrail and a toe board. However, infill panels may also be used in place of the midrail. Where applicable, guardrails must comply with *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation* and *AS/NZS 4576 Guidelines for Scaffolding*.

A guardrail shall be provided on relevant parts of solid construction including the perimeter of buildings and other structures, mezzanine floors, openings in floors and the open edges of stairs, landings, platforms or shaft openings.

Where a fall hazard exists at the entry points to an asset (e.g. reservoir roofs or wet wells), a guardrail shall be provided for a minimum distance of two metres on each side of the entry point.

Guardrails around hatches and similar openings shall fully surround the opening (except for the access point where a self-closing gate is fitted).

Guardrails to areas beyond a regular work platform or walkway, where only infrequent access is required, shall be provided where indicated by a risk assessment.

A self-closing gate shall be installed as part of a guardrail, at the entry point to a work area where there is a fall risk. The gate shall be installed:

- opening inwards at the point of entry to a roof or platform
- opening outwards at the point of entry to a barrier around a wet-well, hatch, pit or similar opening.

Where a guardrail is not practicable, a fall injury prevention system shall be provided. Examples of where a guardrail may not be practicable are:

- where access is infrequent
- where work is of low-intensity, low-complexity or short duration
- where the risk exposure of providing a guardrail exceeds the benefit.

Requirements for the safe removal and reinstatement of guardrails are included in Appendix A of this procedure.

Maintenance or modifications to guardrails must not be undertaken unless assessed and approved by a suitably qualified engineer.

Portable barriers

Portable barriers provide a temporary guardrail system where installation of a permanent guardrail is not practicable.

Portable barriers must comply with the requirements of the *AS/NZS 4994 Temporary Edge Protection* series of standards and must be installed by appropriately trained workers.

Where portable barriers are being installed to undertake a work activity near an existing unprotected edge, the workers installing the barriers must be protected from falling by a fall restraint system.

Where portable barriers are being installed to undertake a work activity in a work area where an unprotected edge will be created as part of the work (i.e. the removal of a pit lid), where practicable the portable barrier must be installed prior to the unprotected edge being created (i.e. before the pit lid is removed).

Where a routine work activity is undertaken that requires workers to use portable barriers, an assessment should be undertaken to determine if permanent guardrails should be installed.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 12 of 40

Workers should raise any safety improvements that will eliminate the need to use portable barriers with their line supervisor or Regional WHS Advisor.

5.5.5 Grid mesh flooring

Grid mesh is often used as a flooring material on walkways and platforms. Grid mesh can be made of galvanised steel, aluminium or fibre reinforced plastic.

Grid mesh must be designed, installed, used and maintained in accordance with the requirements of *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*.

Maintenance or modifications to grid mesh must not be undertaken unless assessed and approved by a suitably qualified engineer.

The process to be used for the safe removal and reinstatement of grid mesh are included in Appendix A of this procedure.

5.5.6 Asset improvements to eliminate work at height

Where a routine work activity is undertaken that requires workers to work at height an assessment should be undertaken to determine if asset modifications can be made or if work methods can be changed to remove the need to work at height.

Workers should raise any safety improvements that will eliminate the need to work at height with their line supervisor or Regional WHS Advisor.

5.6 Passive fall protection devices

Where working at height cannot be avoided, risk controls must be implemented to prevent falls from occurring.

A fall risk exists, and must be controlled, if:

- a worker can approach within two metres of an unprotected edge or other fall hazard, such as a fragile roof; or
- beyond two metres from an unprotected edge or other fall hazard, where there are additional risk factors such as a windy location, or a sloping, slippery or uneven surface.

Effective fall prevention is achieved by selecting, installing and using equipment that is designed to prevent a worker falling while performing work activities at height. When replacing fall equipment, the replacement equipment must meet the current coefficient of performance or the relevant Australian Standard.

Further information on fall protection devices outlined in this procedure is included in Appendix C.

5.6.1 Temporary work platforms

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 work activity.

Work platforms are designed to prevent workers from falling. Temporary work platforms include scaffolds, elevated work platforms, workboxes, step platforms or any other temporary platform that provides a working area and is designed to prevent a fall.

The minimum requirement for temporary work platforms used at Seqwater workplaces is a fully decked work platform (at least 450 x 450mm in size) that is fitted with edge protection. Where a ladder is used to access the work platform, the ladder must be firmly secured and rise at least one metre above the deck of the platform.

Where a temporary work platform does not adequately control the risks of undertaking work at height, a fall restraint system or a fall arrest system shall be used in conjunction with the work platform.

Specific types of temporary work platforms and their associated requirements for using them at Seqwater workplaces are identified in the following sections.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 13 of 40

Scaffolding

The following requirements apply to all scaffold erected and used at Seqwater workplaces:

- Scaffolding must conform to the requirements of *AS/NZS 4576 Guidelines for Scaffolding* and the *AS/NZS 1576 Scaffolding* series of standards.
- All scaffolding must be erected, altered and dismantled by competent persons.
- Persons erecting scaffolds shall use a fall-arrest / restraint system in situations above 1.8 metres where it is not possible to maintain three points of contact with the scaffold (i.e. using two hands to perform work).
- Prefabricated scaffolds are of the same type and not mixed components, unless the mixing of components has been approved by the manufacturer.
- Safe access to and egress from the scaffold must be provided.
- Edge protection (hand rails, mid-rails and toe boards) must be provided at every open edge of a work platform.
- All scaffolding must be inspected by a competent person before use, after any incident that could affect its stability (such as a severe storm), after any alteration or repair, and at least every 30 days.
- Incomplete scaffolds must have barriers erected on the access and egress points and out-of-service tags affixed to each barrier.

The following specific requirements apply to scaffold erected and used at Seqwater workplaces where a person or object could fall more than four metres:

- The scaffold must be erected, altered and dismantled by, or under the direct supervision of, a licensed scaffolder.

The scaffold must not be used unless a competent person provides written confirmation that the scaffold has been completed, is safe to use, and conforms to relevant legislative requirements. Workers using scaffolding to perform work must be trained on the use of the scaffold and understand the following:

- The loads that the scaffold can safely support.
- That any unauthorised alterations to the scaffold are prohibited (such as removing guard rails, planks, ties, toe boards and braces).
- That the working platforms need to be kept clear of debris and obstructions along their length.
- That incomplete or defective scaffolds must never be accessed.

Workers performing work from scaffold platforms shall not leave the confines of the platform edge protection without being fitted with a suitably anchored fall-arrest system.

Mobile scaffolding

Mobile scaffolding shall be used:

- where it is not practicable or economical to use fixed scaffolding
- where there is a requirement for regular movement of the working platform
- where the supporting surfaces are hard and level
- as determined by a risk assessment.

Mobile scaffold is restricted to nine metres in height and the total height of mobile scaffold must not be more than three times the height of the smallest base dimension (i.e. must not be more than three times the height of the shortest side of the scaffold).

Where work is performed using mobile scaffolds, workers must be trained on the use of the mobile scaffold and understand that:

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 14 of 40
---------------	----------------------	--	----------------------------	---	---------------

- the scaffold must remain level at all times
- the scaffold must be kept well clear of powerlines, open floor edges and penetrations
- the scaffold must not be accessed until the castors are locked to prevent movement
- the scaffold must never be moved while anyone is on it
- the scaffold must only be accessed using internal ladders.

Elevated work platforms

Elevated Work Platforms (EWPs) include scissor lifts, cherry pickers and boom lifts. EWP's can be either battery powered or powered by internal combustion engine. Some are designed for hard flat surfaces only, while others are designed to be operated on rough terrain.

The following are the requirements for selecting and operating an EWP at Seqwater workplaces:

- The manufacturer's or supplier's instructions are consulted for information on safe operation.
- Workers operating the EWP are trained and instructed in safe operating procedures for the particular model and type of equipment. The training must include the safe use of fall arrest equipment and emergency rescue procedures.
- Where identified by the risk assessment for the work, a spotter should be used for the duration of work involving the EWP.
- Workers must be licensed when operating boom-type elevated work platforms with a boom length of 11 metres or more.
- Under no circumstances shall the safe working load (SWL) be exceeded and no EWP is to be used as a crane.
- The EWP is only used as a working platform and not as a means of entering and exiting a work area unless the conditions defined in *AS 2550.10 Cranes, hoists and winches - Safe use - Mobile elevating work platforms* are met.
- The operator is responsible for ensuring that all wheel chocks are in place, outriggers are correctly and safely placed, the pre-operating safety check is done and approved safety and rescue equipment is fitted.
- Persons working in travel towers, boom lifts or cherry pickers wear a properly anchored safety harness.
- Unless designed for rough terrain, the EWP must only be used on a solid level surface.
- The ground surface in the direction of travel must be checked to ensure there are no penetrations or obstructions which could cause uncontrolled movement or overturning of the EWP.

Platform step ladders

Platform step ladders may provide a safe temporary work platform to undertake work at height. Platform step ladders used at Seqwater workplaces must incorporate a safety gate to provide a barrier on all sides of the work platform while the worker is on the platform.

Platform step ladders must be selected, positioned and used in accordance with the requirements of section 4.9 of this procedure.

Workboxes

A workbox is designed to be supported by a crane, hoist, forklift or other mechanical device to provide an elevated work area for persons working from the box.

A workbox consists of a platform surrounded by an edge protection system and shall be designed in accordance with *AS 1418.17 Cranes (including hoists and winches) – Design and construction of workboxes*.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 15 of 40

Where reasonably practicable, other working platforms, such as scaffold or an EWP, should be used as an alternative to a workbox.

The following are the requirements for selecting and operating a workbox at a Seqwater workplace:

- The workbox is designed for the task being performed and is securely attached to the mechanical lifting device. The workbox, lifting attachments and inspection records should be checked by a competent person before use.
- The workbox must be 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 must be attached to the anchorage by a lanyard and harness unless the workbox is fully enclosed.
- Workers must remain within the workbox while they are being lifted or suspended.
- Workers must never enter or leave the workbox when it is suspended (except in an emergency).
- No other devices (e.g. ladders) are to be used to gain additional height in the workbox.
- The workbox must not be suspended over other workers at any time.
- The mechanical lifting device must be fitted with the means to safely lower the workbox in an emergency or a power supply failure.
- The mechanical lifting device is suitably stabilised at all times while the workbox is used.
- The mechanical lifting device has 'drive up' and 'drive-down' controls on both the hoisting and luffing motions and those controls are used. No de-clutching allowing free fall is to be used while a workbox is in use.
- An effective means of communication between any person in the workbox and the operator must be provided.
- The mechanical lifting device is fitted with a safety hook and moused (lashed) accordingly.
- The operator remains at the controls of the mechanical lifting device at all times.

For specifications for the use of crane workboxes refer to AS 2550.1 Cranes, hoists and winches – Safe use – General Requirements.

A workbox fitted to a forklift must be securely attached to the forklift carriage, engineer-designed and constructed in accordance with AS 2359 Powered Industrial Trucks.

5.7 Fall restraint systems

A fall restraint system controls a person's movement by physically preventing the person reaching a position where there is a risk of a fall. A fall restraint system consists of a harness that is connected by a lanyard to an anchorage or horizontal life line. The fall restraint system must be set up to prevent the wearer from reaching an unprotected edge.

All equipment used for fall restraint systems should be designed, manufactured, selected and used in compliance with the *AS1891 Industrial fall-arrest systems and devices* series of standards.

Fall restraint systems should only be used if it is not reasonably practicable to prevent falls by providing a physical barrier (e.g. a guard rail). This is because restraint techniques require a high level of user skill to operate safely and also greater supervision.

A fall restraint system must be installed by a competent person in accordance with the manufacturer's instructions. Restraint anchorage should be designed for fall-arrest loading.

Full body harnesses, including energy-absorbing lanyard are **mandatory** for fall restraint systems. Belt, chest or 'sit' type harnesses are **NOT** to be used.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 16 of 40

The harness connection point to the lanyard must be made at the top dorsal position. An alternative attachment position is when a line and rope-grab device is used on steeply sloping roofs and the user needs to manually operate the device by having the device in front. In these circumstances the user may make the lanyard connection onto a front connection point of the harness as recommended by the manufacturer.

A fall restraint system is suitable for use where a worker can maintain secure footing without having to tension the restraint line and without the aid of any other hand hold or lateral support.

When deciding whether secure footing can be maintained, the following must be considered:

- the slope of the surface
- the supporting material type
- the surface texture of the surface and whether it is likely to be wet, oily or otherwise slippery.

When selecting and using a fall restraint system, the following shall be considered:

- The correct selection, installation and use of the equipment.
- That the system is designed and installed so that the person is not able to reach a position from which they are able to fall.
- That the equipment and anchorages are designed, manufactured and installed to be capable of withstanding the force applied to them as a result of a person's fall.
- That the equipment has been inspected and has a current inspection tag fitted (where required).
- That workers using a fall restraint system wear adequate head protection to protect them in the event of a fall.
- That where the equipment has been used to arrest a fall, it is not used again until it has been inspected and certified by a competent person as safe to use.

Where the work method requires persons to detach and re-attach from a fall restraint device whilst at height, a dual lanyard system shall be utilised to ensure that at least one connection point is maintained at all times.

All fall restraint system components must be permanently marked or labelled to indicate their purpose, correct use, limitations and other relevant information aimed at reducing misuse of the equipment.

No person may wear a harness or use any other fall restraint device unless they have been trained in their safe use.

An individual fall arrest system should be used instead of restraint techniques if:

- the user can reach a position where a fall is possible
- the user has a restraint line that can be adjusted in length so that a free fall position can be reached
- there is a danger the user may fall through the surface, for example fragile roofing material
- the slope is over 15 degrees
- there is any other reasonably likely use or misuse of the system that could lead to a free fall.

Further information on fall restraint systems outlined in the following sections is available in Appendix C.

5.7.1 Davit systems

Davits are commonly used for raising and lowering equipment, moving workers to a different work level, such as in confined space entry, and for performing rescues. Various davit types are used by Seqwater. Davit systems include the davit base, davit arm and winch (Type 2 or 3).

A davit may be permanently mounted or portable. Portable davits may also be used with a fixed or portable base.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 17 of 40
---------------	----------------------	--	----------------------------	---	---------------

Davit systems must be inspected and tested in accordance with the requirements of the Safe Work with Plant Procedure ([PRO-00867](#)). Where practicable, davit base anchorages shall be designed so that they do not require regular proof-load testing e.g. flush mount davit bases.

When determining the location of davit bases, all intended uses must be considered, including consideration of the relationship to adjacent equipment and infrastructure such as valves, hatches and guardrails, and accessibility for proof-load testing.

Davits shall be used in accordance with manufacturer's instructions. Workers using davit systems for lowering or extracting workers from work areas (i.e. confined spaces) must be appropriately trained and competent in the use of the davit system.

The anchor point and associated equipment shall be checked prior to use. Davits shall not be used if the compliance period has expired or there is no compliance tag fitted to the device.

Damaged davits and associated equipment must be identified by attaching an 'Out of Service Tag' and the damage reported to the worker's line supervisor or manager for repair.

5.8 Work positioning systems

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, should undertake a competency based course of training before using any work positioning systems.

Industrial rope access systems

Industrial rope access systems are used for gaining access to and working at a workplace, usually by means of vertically suspended ropes. Although fall-arrest components are used in the industrial rope access system, the main purpose of the system is to gain access to a work area rather than to provide backup fall protection.

All other methods of accessing a workplace should be considered (e.g. EWP, scaffold) before using rope access systems.

When using industrial rope access systems, the following must be considered:

- workers are trained and competent in the technique being used
- workers do not work alone, in case they require assistance in an emergency
- industrial rope access systems are installed only in a location where it is possible to provide prompt assistance or rescue if required
- all equipment is inspected regularly by a competent person
- prior to use, all fixed anchorage points are checked by a competent person before attaching the rope access lines
- a back-up system is used to protect the worker
- two independently anchored ropes are used for each worker
- any person within three metres of an unguarded edge is adequately secured (this is an increase from the usual requirement to control fall risks where a worker can approach within two metres of an unprotected edge or other fall hazard)
- all workers wear a full body harness
- supervisors can communicate with workers
- where necessary, appropriate PPE is used, such as helmets, gloves, hearing protection, goggles and masks

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 18 of 40

- barricades and signposts are placed on all access areas below the working area and anchorage locations to exclude and alert the public and tradespeople.

Further guidance on industrial rope access systems is available in *AS/NZS 4488 Industrial rope access systems*.

5.9 Fall injury prevention devices

If a worker can approach within two metres of an unprotected edge or other fall hazard, such as a fragile roof, a fall risk exists and must be controlled. However, where there are additional risk factors such as a windy location, or a sloping, slippery or uneven surface a fall risk may exist beyond the two metre approach distance.

If a risk of a fall from height remains following the implementation of fall prevention measures or where adequate fall prevention measures are either impracticable or unable to prevent the possibility of a fall, risk control measures must be implemented to minimise the distance and/or consequences of a fall.

Further information on fall injury prevention devices outlined in this procedure is included in Appendix C.

5.9.1 Fall arrest system

A fall arrest system is intended to safely stop a worker falling an uncontrolled distance and reduce the impact of the fall. Fall arrest systems **DO NOT** prevent falls, they are designed to arrest a fall.

All equipment used for fall arrest systems must be designed, manufactured, selected and used in compliance with the *AS1891 Industrial fall-arrest systems and devices* series of standards.

A fall arrest system must be installed by a competent person in accordance with the manufacturer's instructions. Restraint anchorage should be designed for fall-arrest loading.

All fall arrest system components must be permanently marked or labelled to indicate their purpose, correct use, limitations and other relevant information aimed at reducing misuse of the equipment.

Full body harnesses, including energy-absorbing lanyard are **mandatory** for fall arrest systems. Belt, chest or 'sit' type harnesses are **NOT** to be used.

The harness connection point to the lanyard must be made at the top dorsal position. An alternative attachment position is when a line and rope-grab device is used on steep sloping roofs and the user needs to manually operate the device by having the device in front. In these circumstances, the user may make the lanyard connection onto a front connection point of the harness as recommended by the manufacturer.

Situations where fall arrest systems must be used include:

- working outside of a guard railing or in an area where there is no railing (e.g. a roof, on beams, etc.)
- working in an EWP, workbox or similar.

Key safety considerations in using fall arrest systems include:

- the correct selection, installation and use of the equipment
- that the equipment and anchorages are designed, manufactured and installed to be capable of withstanding the force applied to them as a result of a person's fall
- that the system is designed and installed so that the person travels the shortest possible distance before having the fall stopped
- that workers using a fall arrest system wear adequate head protection to protect them in the event of a fall
- workers should not use a fall-arrest system unless there is at least one other person on the site who can rescue them if they fall (refer section 4.15 of this procedure for specific emergency requirements relating to the use of fall-arrest systems)
- if the equipment has been used to arrest a fall it is not used again until it has been inspected and certified by a competent person as safe to use.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 19 of 40

Where the work method requires persons to detach and re-attach from a fall arrest device while at height, a dual lanyard system shall be utilised to ensure that at least one connection point is maintained at all times.

No person will wear a harness or any other fall arresting device unless they have been trained in their safe use.

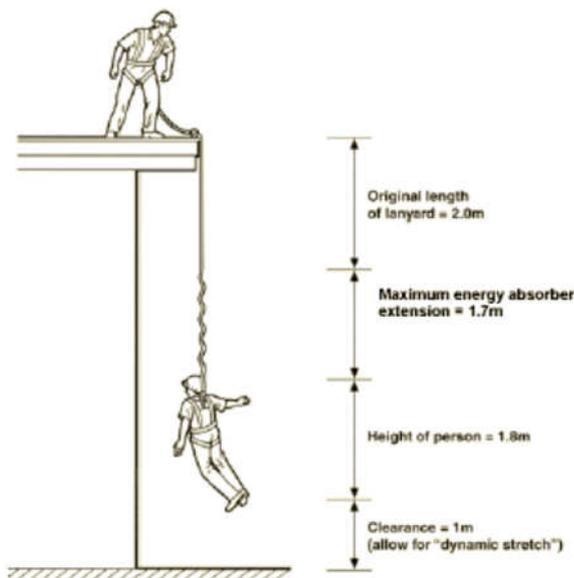
Limit free fall distance

Fall arrest systems, incorporating a lanyard, should be installed so that the maximum distance a person would free fall before the fall arrest system takes effect is two metres.

There should be sufficient distance between the work surface and any surface below to enable the system, including the action of any shock absorber to fully deploy (see figure below) before the worker impacts any surface.

To establish the free fall distance for a work activity, the following must be considered:

- 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



devices (intermediate anchorages).

the length of the energy absorber when extended by a fall.

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 (which is called 'swing back').

Swing down can occur if the lanyard slides back along the perimeter edge of the roof until it is vertical. When this happens, the person may hit the ground, or the lanyard may break as a result of its contact with the edge of the roof. Measures to address 'swing down' include:

the installation of guard rails

- placing the anchorage point at a right angle to the position of the lanyard at the perimeter edge (e.g. by using a mobile anchorage)
- the installation of a second anchorage point and belay

5.9.2 Double lanyards

The use of a double lanyard (also known as a twin tail or 'Y' lanyard) allows a worker who is climbing to always be connected to a ladder or structure.

When using double lanyards, workers must comply with the following:

- There must be no back hooking with the lanyards
- The lanyards should not be wrapped around the body or passed between the legs

The harness chest connection should never be higher than the highest attachment point. Double lanyards are not suitable for frequent use (because of possible misuse or muscle injury) and the ladder or structure points must be capable of arresting forces generated by a fall with the double lanyard. Where practicable, anchorage lines or rails should be installed and used in preference to using a double lanyard.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 20 of 40

All workers using double lanyards must have received specific training and be assessed as competent in the use of a double lanyard system before commencing the activity.

5.9.3 Safety nets

Safety nets can provide a satisfactory means of fall protection while allowing workers maximum freedom of movement. Safety nets should not be used to enter or exit a work area or as a working platform.

If safety nets are used, the following must be considered:

- safety nets are securely anchored before any work starts
- safety nets are constructed of material to minimise injury to a person and strong enough to catch a falling person or thing
- safety nets are hung as close as is practicable to the underside of the working area, but no more than two metres below the working area
- perimeter safety nets used where there is no edge protection extend at least 2.5 metres beyond the leading edge of the working area
- the safety net has sufficient tension and clearance to prevent a falling person from contacting any surface or structure below the net
- material is not allowed to accumulate in suspended safety nets
- no welding or oxy cutting is performed above safety nets
- safety nets are inspected in accordance with manufacturer specifications, particularly after installation, relocation or repair
- safety nets are stored correctly in dry, shaded areas with good air circulation.

5.10 Portable ladders

Portable extension or single ladders should generally only be used as a means of access to or egress from a work area.

Portable ladders should **not** be used as a work platform where alternative safer methods of performing the work activity are available (i.e. elevated work platform, scaffold, platform stepladder, etc.).

Portable ladders should **only** be used as a working platform where:

- the work activity can be conducted safely using one hand while maintaining three points of contact with the ladder at all times (where three points of contact cannot be maintained with the ladder whilst performing the work activity, and alternate safer methods are not reasonably practicable, adequate safeguards must be used to secure the ladder and worker to the structure being climbed)
- the work activities can be safely carried out from the ladder (i.e. does not involve heavy equipment or a high degree of leverage force)
- the work activity is of a short duration.

5.10.1 Selecting ladders

Ladders must be selected to suit the specific task or work activity to be undertaken. Consideration should be given to the duration of the task, the physical surroundings of where the task is to be undertaken and the prevailing weather conditions.

Ladders purchased for use at Seqwater workplaces and ladders brought onto a Seqwater workplace by contractors, shall be designed in accordance with *AS 1892: Portable ladders* suite of standards.

All ladders used at Seqwater workplaces must have a load rating of not less than 120kg and be manufactured for industrial use.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 21 of 40

Ladders used for electrical work must be manufactured of non-conductive materials.

5.10.2 Positioning ladders

Any ladder used at a Seqwater workplace must be set up on a solid and stable surface to prevent the ladder from slipping. Single and extension ladders can be prevented from slipping by:

- placing ladders at a slope of 4:1
- using step ladders in the fully opened position
- securing ladders at the top or bottom, or if necessary, at both ends.

5.10.3 Ladder access and egress

Where fixed or extension ladders are used for access or egress, the following must be considered:

- there is a firm, stable work platform, free from obstructions, to step onto from the ladder
- the ladder extends at least one metre above the stepping-off point on the working platform
- fall protection is provided at the stepping-off point where people access the working platform.

Fall-restraint or fall-arrest systems are to be used by persons using a ladder as a working platform where their working height (at the level they are standing on) is greater than 1.8m above any area.

5.10.4 Safe Use of Ladders

When a ladder is used at a Seqwater workplace, the following must be considered:

- The ladder is in good condition – the ladder should be inspected for faults, such as broken rungs, stiles and footing before it is used.
- Damaged ladders must be removed from service and an out of service tag must be attached.
- The ladder is the correct height for the task to avoid reaching or stretching (i.e. must be of a length that ensures a person's feet are not positioned any higher than the third highest tread).
- The ladder is not placed so that the weight of the ladder and any person using the ladder is supported by the rungs.
- Step ladders must only be used in the fully opened position.
- All the locking devices on the ladder are secure.
- Materials or tools are not carried while climbing the ladder – the worker is to use a tool belt / side pouch or the materials or tools are to be hauled up to the work area only after the worker is secured by a fall restraint or fall arrest system.
- Only light duty work is undertaken while on the ladder, where three points of contact can be maintained and tools can be operated safely with one hand.
- Slip resistant base, rungs or steps are provided.
- Slip resistant shoes are worn.
- Additional appropriate precautions must be implemented when using ladders in the following situations:
 - in access areas or doorways – if necessary, erect a barrier or lock the door shut
 - on scaffolding or an EWP to get extra height
 - when working in an electrical safety exclusion zone, controls must be implemented in accordance with the requirements of the WHS Electrical Safety Procedure ([PRO-00006](#))
 - in very wet or windy conditions

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 22 of 40
---------------	----------------------	--	----------------------------	---	---------------

- next to traffic areas, unless the working area is barricaded.

When using a ladder, the following activities must not be undertaken unless appropriate fall protection equipment is used:

- Use of a stepladder near the edge of an open floor or beside any railing.
- Over-reaching from the ladder (the centre of the torso should be within the ladder stiles throughout the work).
- Use of any power or hand tool requiring two hands to operate, such as concrete cutting saws and circular saws.
- Use of tools that require a high degree of leverage force which, if released, may cause the user to over-balance or fall from the ladder, such as pinch bars.
- Facing away from the ladder when going up or down, or when working from it.
- Standing on a rung closer than 900mm to the top of a single or extension ladder
- Standing higher than the second tread below the top plate of any stepladder (with the exception of three-rung step ladders).

5.10.5 Portable ladder maintenance

Portable ladders should be regularly inspected by a competent person in accordance with the manufacturer's recommendations. Ladders with any of the following faults must be replaced or repaired:

- fibreglass stiles cracked, chipped or severely faded with fibres exposed
- metal stiles twisted, bent, kinked, crushed or with cracked welds or damaged feet
- rungs, steps, treads or top plates that are missing, worn, damaged or loose
- tie rods missing, broken or loose
- braces, or brackets that are missing, broken or worn
- missing, loose, bent or worn fasteners, i.e. rivets, bolts and pins
- worn or damaged feet, including non-slip material.

5.11 Anchorage points

5.11.1 Permanent anchorage points

Each permanent anchorage point used for fall restraint or fall arrest systems should comply with the requirements in *AS/NZS 1891:4 Industrial fall-arrest systems and devices – selection, use and maintenance*. Anchorage points for use in industrial rope access activities must comply with the requirements of *AS/NZS 4488 Industrial rope access systems*.

Each permanent anchorage point must be:

- installed in accordance with the instructions of the manufacturer or supplier. If no instructions are available, the advice of an engineer or competent person must be sought
- inspected and approved by a competent person before the anchorage point is first used
- inspected and tested in accordance with the requirements of the Safe Work with Plant Procedure ([PRO-00867](#))
- located so that a lanyard can be attached to it before a person(s) moves into a position where they could fall.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 23 of 40

Damaged anchorages or anchorages overdue for inspection must not be used and an out of service tag must be attached. The anchorage must not be used until it has been repaired and/or inspected and tested by a competent person.

5.11.2 Temporary anchorage points

Temporary anchorages may be established for infrequent work where it is impractical to provide a permanent anchorage. Alternate methods of undertaking the work activity must be evaluated before a temporary anchorage is established.

A specialist contractor and/or suitably qualified engineer must be engaged to identify and establish temporary anchorages.

Temporary anchorages must be established and used by appropriately trained and competent workers and in accordance with manufacturers' instructions (where available).

Temporary anchorages must have a minimum ultimate strength of 15kN (1500kg) for a single person anchorage, or 21kN (2100kg) for a double person anchorage.

Slings, ropes and webbing shall be protected in all situations where abrasions or cutting could lead to failure.

Where there is a doubt regarding the suitability of the temporary anchorage, the anchorage must not be used until it is assessed by a suitably qualified engineer.

5.11.3 Anchorage lines or rails

Anchorage lines or rails are fall-arrest systems, which can be installed to provide continuous fall protection for persons using ladders or walking along an area where there is a fall risk (i.e. inspecting the flip bucket of a dam, working on a roof). Anchorage lines or rails can be used on plant, as well as buildings or structures.

When installing or using anchorage lines or rails, the following must be considered:

- Systems must comply with the *AS1891 Industrial fall-arrest systems and devices* series of standards.
- The locking device must be attached to the frontal attachment point of the harness and the lanyard assembly is a maximum of 300mm long.
- The point of connection onto the ladder by the climber is near the base of the ladder to allow the connection before ascending begins and also to provide continuous connection to the disconnecting point when at a safe higher level.
- The free fall is limited to a maximum of 600mm.
- Permanent systems are of wire or rail construction and are installed according to the manufacturer's instructions.

After any fall from an anchorage line or rail, the system must be removed from service and inspected by a competent person before it is used again.

5.12 Administrative controls

Administrative controls may be used to support other fall risk control measures and may include work permits, work planning, safe work procedures, warning signage and exclusion zones.

Using administrative controls exclusively to minimise the risk of falls is only appropriate for work activities involving low fall risks and where it is not reasonably practicable to use higher order controls.

Work permit

A Work at Height Permit ([FRM-00414](#)) is required where a work activity is undertaken:

- at a height of two metres or greater and the work location is not designed for human occupation (i.e. the work location is not fitted with guardrails, ladder cages, etc. that prevent a worker from falling); or

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 24 of 40

- at a height of less than two metres where other factors at the work location increase the risk of a worker falling (i.e. weather conditions, sloping, slippery or uneven surfaces); or
- when utilising working at height access equipment such as elevated work platforms, scaffolding or work boxes.

5.12.1 Work planning

Work activities that involve work at height should be planned to ensure that:

- an appropriate number of workers are available to perform the task (e.g. work involving the use of a harness should never be performed alone)
- the required access equipment and safety equipment is available and has been inspected and tested where required
- other work activities are not being undertaken in the area at the same time (i.e. where the work at height creates a risk for workers below).

5.12.2 Signage

Signage is an administrative control, which may be required in some circumstances. Signs that may be used to control fall risks include:

- no step
- keep off (fragile roof)
- overhead work
- safety harness must be worn
- exclusion zone
- emergency exit.

All signs used must conform to *AS 1319 Safety signs for the occupational environment*, and must be clearly visible from common angles of approach. Each sign must indicate the hazards and the mandatory controls required to access and work in the area.

5.12.3 Exclusion zones (drop zones)

Where overhead work is to be performed and there is a risk of equipment, materials or tools falling from the elevated position, a drop zone must be established below the elevated position.

The location of the overhead work shall be assessed and the extent of the drop zone must be determined with respect to:

- the height of the work above the lower level
- the possible deflection of falling objects by structures, pipes or equipment in the area.

The drop zone may need to be cleared of all personnel and mobile or portable equipment. In addition, any static equipment may need to be protected in the event of falling objects.

A striped tape barrier (or similar) may need to be erected so as to completely surround the drop zone with a sign on each side displaying “CAUTION – OVERHEAD WORK – KEEP CLEAR” or similar. The height of the barrier shall be approximately one metre above ground level and must be kept in place while the hazard is present.

If the overhead work is suspended for any period, excluding crib breaks, the equipment, materials and tools at the elevated workplace are to be secured and the barrier at the lower level removed and the drop zone re-applied on the resumption of work.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 25 of 40
---------------	----------------------	--	----------------------------	---	---------------

Where the overhead work is extended or moves outside the drop zone, the drop zone shall be re-assessed and re-applied before work commences. The drop zone barriers shall be removed on completion of the overhead work.

5.13 Inspection, maintenance and storage of fall protection system equipment

5.13.1 Equipment user inspections

When working at height, the inspection of safety equipment by workers using the equipment is critical as workers lives depend upon the continued efficiency and durability of the equipment. A proper inspection at each time of use is the first line of defence against hazard associated with faulty equipment.

The following items shall be subjected to inspection by the worker using safety equipment before and after each use to ensure that it is in a serviceable condition:

- personal equipment – harnesses, lanyards, connectors and fall-arrest devices
- common use equipment – ropes, slings, fall-arrest devices and mobile attachment devices.

The inspection shall be carried out by a worker who is competent to perform the inspection. Inspections shall be undertaken in accordance with the Inspection of Height Safety Equipment Checklist ([FRM-00634](#)).

Inspection shall be by both sight and touch and shall include the checking of the test tag (to ensure that the equipment is in test) and opening of any equipment where access for daily inspection is provided (to ensure that internal components are in satisfactory condition). This requirement includes the opening or removal of temporary rope or line protectors to enable rope to be properly inspected. Operation of the locking mechanism on fall-arrest devices must also be checked.

Training and assessment of workers performing work at height shall include competency in carrying out the inspections specified in this section.

5.13.2 Regular scheduled periodic inspections

All items of safety equipment which are in regular use to perform work at height shall be subjected to periodic inspection and where applicable, maintenance and servicing, at the manufacturer's recommended intervals.

The intervals specified in Appendix D of the Safe Work with Plant Procedure ([PRO-00867](#)) shall apply for each item of safety equipment.

The inspection and servicing of safety equipment used for working at height shall be carried out by an appropriately trained and qualified inspector in accordance with the requirements of *AS/NZS 1891.4 Industrial fall arrest systems and devices – Selection, use and maintenance*. Note: a worker trained to perform work at height is not necessarily qualified to perform periodic inspections on the safety equipment.

Items used under harsh conditions, e.g. in wet, dusty, abrasive or corrosive environments, shall be inspected more frequently, generally at twice the frequency specified in Appendix D of the Safe Work with Plant Procedure ([PRO-00867](#)).

Note: product standards for each of the items dealt with in this section place an obligation on manufacturers to provide maintenance instructions and recommended maintenance/inspection/ service intervals.

If any signs of wear or weakness are found during the inspection, the equipment must be withdrawn from use until they are repaired. An out of service tag must be affixed to the equipment to identify the condition or defect.

Inspection records for safety equipment used for working at height must be maintained for the life of the item of equipment.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 26 of 40

5.13.3 Inspection on entry or re-entry to service

Entry into service of a new item

Each item of safety equipment used for working at height shall be inspected in accordance with the requirements of section 4.13.2 before being placed into service, giving particular attention to whether the item has been correctly assembled and whether all component parts are present including instruction manuals where required.

Re-entry into service after an item has been repaired

Each item of safety equipment used for working at height shall be inspected in accordance with the requirements of section 4.13.2 before being returned to service, giving particular attention to whether the item has been correctly repaired and reassembled.

This inspection should also give attention to parts of the equipment which were not subject to the repair as these may be due for their periodic inspection independently of the repair taking place.

Re-entry into service after a period of storage or out of service

Before use, each item of safety equipment used for working at height shall be inspected in accordance with the requirements of section 4.13.2 after a period of storage or out of service in excess of the nominated inspection or service interval for that item, or where the item has been stored under conditions suspected of adversely affecting its condition. This requirement also applies to fixed or permanent installations when used less frequently than the maximum inspection interval (i.e. infrequently used anchors or davits).

5.13.4 Defective equipment or equipment which has arrested a fall

Any piece of safety equipment used for working at height, including both personal and permanently installed items, which has been used to arrest a fall or which shows any defect during user or periodic inspection, shall be withdrawn from service immediately and a replacement obtained if necessary.

An out of service tag must be affixed to the equipment to identify the condition or defect.

The equipment must be examined by a height safety equipment inspector who will decide whether the equipment is to be destroyed or repaired and returned to service. Where a repair is undertaken, details of the repair shall be documented in CIS and provided to the user of the equipment.

5.13.5 Life expired equipment

Life expired equipment shall be taken out of service as follows:

- Personal equipment – items which have been marked with a date by which they are to be taken out of service (in accordance with *AS/NZS 1891.1 Industrial fall arrest systems and devices – Harnesses and ancillary equipment*) must be taken out of service and destroyed once that date has been reached.
- Horizontal life lines and rails – items which, according to their associated system information, are either to be taken out of service or re-certified by a certain date shall either be dismantled or be re-certified as safe for continued use prior to the nominated date.

5.13.6 Storage and transport

Conditions of storage and transport should ensure that no part of any safety equipment is subjected to unnecessary strain or pressure or to excessive heat, humidity or moisture. In addition, the equipment must be protected from contact with sharp edges, corrosive substances and other possible causes of damage.

Equipment should be air-dried at ambient temperature before storage.

Items made from synthetic materials should be stored away from direct sunlight in a cool, dry place.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 27 of 40
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5.14 Radio frequency communications equipment

Some Seqwater assets have radio frequency communications equipment located on them. The radio frequency fields generated may be hazardous to workers. Workers must observe all safety procedures, including safety exclusion zones as signed, where they are required to access an asset where radio frequency equipment is installed.

5.15 Emergency procedures

Any incidents involving falls must be reported to Seqwater's Incident Hotline (07) 3270 4040

Emergencies involving falls must be managed in accordance with the WHS Emergency Preparedness and Response Procedure ([ERP-00079](#)) and the relevant workplace's Emergency Response Plan.

When establishing emergency procedures for rescuing workers who have fallen, the following factors must be taken into account:

- the nature of the work place
- the location of the work place
- communications at the work place
- communications from the location of the work to emergency services
- rescue and resuscitation equipment and the availability of trained workers
- the physical capabilities of rescuers
- environmental conditions
- appropriate first aid equipment and the availability of trained workers
- the ability for local emergency services to respond and provide assistance in emergency situations.

A High Risk Work Rescue Plan (TEM-00027) must be developed and tested where:

- a worker is using a safety harness to perform the work activity, or
- a risk assessment for the work activity to be undertaken has a residual risk score of high or greater.

For work activities involving a worker using a harness, the rescue plan must ensure a worker is able to be safely removed from the harness within five minutes of sustaining a fall. This is to ensure the worker does not suffer the effects of toxic shock as a result of being suspended in the harness. The safety plan must also detail the methods to be used to safely extract a fallen worker from the work location in the event that a fall occurs.

All workers involved in work at height must be provided with appropriate information, instruction and training in relation to emergency procedures. For fall arrest systems, the training in relation to emergency procedures should:

- include training workers to recognise the risks of suspension intolerance
- include training workers to implement rescue procedures including training workers to act quickly in the rescue of a person being suspended in an upright position for longer than five minutes
- take into account workers competence and ability to retain competence through regular exposure to equipment and skills needed to perform a rescue
- include training workers to administer first aid or have access to persons who are trained to use first aid and have access to first aid equipment.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 28 of 40
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6 Training requirements

Training will be provided in accordance with the Training and Competency Management Procedure ([PRO-01574](#)).

Any workers who may be exposed to work at heights must undertake awareness training on the hazards and risks associate with falls.

Any workers required to undertake work at heights must complete the Work Safely at Heights Course (RIIOHS204A).

7 References

7.1 Legal and other requirements

Description	Status	Location
AS 2550.1 Cranes, hoists and winches – Safe use – General Requirements	Active	www.saiglobal.com/online
AS 2550.10 Cranes, hoists and winches - Safe use - Mobile elevating work platforms	Active	www.saiglobal.com/online
AS 1418.17 Cranes (including hoists and winches) – Design and construction of workboxes	Active	www.saiglobal.com/online
AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation	Active	www.saiglobal.com/online
AS/NZS 4576 Guidelines for scaffolding	Active	www.saiglobal.com/online
AS/NZS 1891.1 Industrial fall arrest systems and devices – Harnesses and ancillary equipment	Active	www.saiglobal.com/online
AS/NZS 1891.3 Industrial fall arrest systems and devices – Fall Arrest Devices	Active	www.saiglobal.com/online
AS/NZS 1891.4 Industrial fall arrest systems and devices – Selection, use and maintenance	Active	www.saiglobal.com/online
AS/NZS 4488 Industrial rope access systems	Active	www.saiglobal.com/online
Managing the risk of falls at workplaces Code of Practice 2011 (Qld)	Active	www.legislation.qld.gov.au
Queensland State Archives General Retention and Disposal Schedule for Administrative Records	Active	www.archives.qld.gov.au/Recordkeeping/RetentionDisposal/Pages/GRDS.aspx
AS 1892 Portable ladders	Active	www.saiglobal.com/online
AS 1319 Safety signs for the occupational environment	Active	www.saiglobal.com/online
AS/NZS 1576 Scaffolding	Active	www.saiglobal.com/online
AS 1170.1 Structural design actions – Permanent, imposed and other actions	Active	www.saiglobal.com/online
AS/NZS 4994 Temporary edge protection	Active	www.saiglobal.com/online
Work Health and Safety Act 2011 (Qld)	Active	www.legislation.qld.gov.au
Work Health and Safety Regulation 2011 (Qld)	Active	www.legislation.qld.gov.au

7.2 Legal and other requirements

Description	Status	Location
ERP-00079 Emergency Preparedness and Response Procedure	Active	Q-Pulse / Waternet
PRO-00657 Hazard Identification and Risk Management Procedure	Active	Q-Pulse / Waternet
PRO-00006 Electrical Safety Procedure	Active	TRIM Ref: D13/92157
PRO-00020 Health Monitoring and Immunisation Procedure	Active	Q-Pulse / Waternet
PRO-00002 Integrated Management System Internal Audit Procedure	Active	Q-Pulse / Waternet
PRO-00867 WHS Safe Work With Plant Procedure	Active	Q-Pulse / Waternet
PRO-01574 – Training and, Competency Management Procedure	Active	Q-Pulse / Waternet

7.3 Legal and other requirements

Description	Status	Location
Job Safety and Environment Analysis Template (TEM-00013)	Active	Q-Pulse / Waternet
Work at Height Permit (FRM-00414)	Active	Q-Pulse / Waternet
Grid Mesh, Flooring and Guard Rail Removal Permit (FRM-00412)	Active	Q-Pulse / Waternet
Height Safety Equipment Checklist (FRM-00634)	Active	Q-Pulse / Waternet
High Risk Work Recovery Plan (TEM-00027)	Active	Q-Pulse / Waternet

Appendix A – Grid mesh, flooring and guard rail removal process

The grid mesh and guard rail removal process applies to the removal and re-instatement of existing grid mesh, flooring or guard rails at Seqwater workplaces.

The process does not apply where panels are installed as part of new asset or major asset upgrade projects. For these works, new and/or refitted grid mesh panels, flooring and guard rails shall be inspected during the projects final inspection (or equivalent).

Process

Implementation of the grid mesh and guardrail removal process ensures that appropriate risk controls are implemented to eliminate or mitigate the risks of falling from an unprotected edge that is created as part of undertaking a work activity.

Where any grid mesh, flooring or guard rail (including chequer plate flooring or covers) are removed and the removal creates a fall risk, a Grid Mesh, Flooring and Guard Rail Removal Permit ([FRM-00412](#)) must be completed.

A fall risk exists, and must be controlled, if a worker can approach within two metres of an unprotected edge or other fall hazard, such as a fragile roof. The Grid Mesh, Flooring, and Handrail Removal Permit ([FRM-00412](#)) must be used in conjunction with a JSEA or Safe Work Method Statement to assess the hazards presented by the removal of the grid mesh, flooring or handrail and to ensure that appropriate risk controls are implemented.

Preparation for the removal of grid mesh, flooring or guard rails

All other reasonable means of undertaking a work activity without the need to remove grid mesh, flooring or guard rails must be considered before commencing the work.

Where grid mesh, flooring or guard rails needs to be removed to undertake a work activity, the following should be considered:

- The provision of emergency response access to the area must be considered and provided for e.g. grid mesh, flooring and guard rails must only be removed from one side of a restricted area at a time. This ensures access and egress to or from the equipment.
- A risk assessment must be undertaken to identify hazards and assess their associated risks, then establish appropriate risk controls to be implemented. The risk assessment must be documented in a JSEA.
- The potential for dropped objects, loads and falling hot materials shall be evaluated and exclusion zones established where required.
- Maintain the original design intent (e.g. floor loading) when work is complete.
- Plan the work and designate a lay down area for the sections to be removed.
- Identify the correct lifting requirements for the sections to be removed.
- The integrity of the structure is to be checked to ensure that:
 - the surrounding area would not be structurally affected by the grid mesh, flooring or guard rails being removed (e.g. interlinking panels)
 - other hazards such as rust, securing devices etc. are identified so as to not affect the work (e.g. manual handling, SWL/ WLL of equipment).

The person responsible for the work shall complete and sign a Grid Mesh, Flooring and Guard Rail Removal Permit ([FRM-00412](#)) before any grid mesh, flooring or guard rails are removed.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 31 of 40

The Grid Mesh, Flooring and Guard Rail Permit ([FRM-00412](#)) together with the JSEA for the work activity must be kept at the work site for the duration of the work.

Establishing an alternate route

An alternate means of access shall be required if the grid mesh, flooring and guard rail to be removed is one or more of the following:

- a principal means of evacuation in the case of an emergency
- the only access to a highly used area
- the only access to fixed emergency equipment
- the only access to operating plant that requires regular inspection or attendance.

Barricading and signage

Where grid mesh, flooring or guard rails are to be removed, a fixed rigid barricade must be erected to restrict all possible access to the area where unprotected edges are created, as well as to the work zone.

In addition, adequate signage must be installed to alert people working in, or traversing the area, to the hazard and to the reason for the barricading. All signs used must conform to *AS 1319 Safety signs for the occupational environment*, and must be clearly visible from common angles of approach. Each sign must indicate the hazards and the mandatory controls required to access and work in the area.

The drop zone below where grid mesh, flooring or guard rails are to be removed must also be barricaded and appropriately sign posted to identify the hazards.

The barrier and signage around the unprotected edge must stay in place until the grid mesh, flooring, or handrail has been replaced and fastened with permanent fixings.

Personal protection

All workers engaged in the removal of grid mesh, flooring or guard rails, where any potential fall exists, shall wear a safety harness and lanyard which must be attached to an approved structure or static line at all times.

Removal of grid mesh, flooring and guard rails

Grid mesh, flooring, or guard rails must be handled with the appropriate lifting equipment. If a crane is used, it must use an approved lifting device (wire slings or chains with safety hooks). The panels must only be handled by workers wearing appropriate fall prevention equipment.

All removed grid mesh, flooring or guard rails must be either:

- immediately removed from the work area to a storage location, or
- be stood on edge and securely lashed in place to avoid the creation of a trip hazard.

Workers engaged in the removal of grid mesh, flooring or guard rails must NEVER leave the area of work unattended until the opening is made safe, except where the removal of guardrails are required for flood preparation and mitigation work

Re-instatement of grid mesh, flooring and guard rails

At the completion of the work activity, any grid mesh, flooring and guard rails removed to undertake the work shall be re-instated and appropriately secured into position.

All grid mesh, flooring or guard rails shall be secured immediately on placement.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 32 of 40
---------------	----------------------	--	----------------------------	---	---------------

Where grid mesh or flooring cannot be attached with permanent fixings, temporary clips or 2mm diameter (minimum) wire may be used as a temporary fixing. The use of wire is a temporary measure to be used during placement only and is not acceptable as a permanent fixing.

Grid mesh, flooring or guard rail panels must **NEVER** be left unsecured during absences or overnight.

The person responsible for the work must inspect the re-installed grid mesh, flooring or guard rails to confirm that they are safe for access. If the grid mesh, flooring or guard rails are not installed correctly, or if they are damaged or defective, barricading and signage must remain in place until the defects are rectified and the area is safe for access.

Once the grid mesh, flooring and guard rails are assessed as safe for access, the person responsible for the work shall complete and sign the Grid Mesh, Flooring and Guard Rail Removal Permit ([FRM-00412](#)).

Completion of work

At the completion of work, all tools and equipment must be removed from the work area. Barricades and signs must be removed and a final inspection must be undertaken to ensure the area is safe for access.

The Grid Mesh, Flooring and Guard Rail Removal Permit ([FRM-00412](#)) must be attached to the Work Order and saved in CIS.

Damaged or defective grid mesh, flooring or guard rails

If grid mesh, flooring or guard rails are found to be damaged or defective, barricades and signage must be erected surrounding the affected area. The person identifying the damaged or defective grid mesh, flooring or guard rails must raise a work request for the required repairs or alterations.

All alterations and modifications to grid mesh, flooring and guard rails must be inspected and approved by an appropriately qualified Technical Specialist/Engineer in accordance with the Engineering Review and Approval Procedure ([PRO-00867](#)).

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 33 of 40
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Appendix B – Specific requirements for access and egress structures

Stairways

A stairway is the preferred means of access to a work area where a large vertical distance is involved and a level or sloping walkway is not practicable.

Stairways shall comply with *AS1657 Fixed Platforms, Walkways and Ladders*.

Where permanent access is required to another level 3m or greater, an access stairway shall be provided (where practicable).

Where access is required to another level less than 3m, a stairway shall be provided where indicated by a risk assessment.

Where a stairway is not practicable, the next highest control measure shall be provided.

Access ladders on existing assets shall be upgraded to a stairway, where indicated by a risk assessment.

Fixed ladders

Fixed ladders are used for access and egress where a stairway is not practicable.

Fixed ladders shall comply with *AS1657 Fixed Platforms, Walkways and Ladders*.

Fixed access ladders shall be provided for access to a work site or platform where a higher form of access (e.g. stairway) is not practicable.

Where a fixed ladder is not practicable, an alternative safe access method shall be chosen such as portable davit.

The preferred type of ladder, in priority order is: step ladder, inclined rung ladder then vertical rung ladder.

Ladder climbing system

A ladder climbing system (LCS) is a fall-arrest system which provides continuous fall protection for workers using fixed ladders. While using the ladder, the worker wears a harness anchored to a steel rail or cable by a rope grab. In the event of a fall, the locking mechanism in the grab will engage, gripping the rail or cable and arresting the fall. Free fall is limited to a maximum of 600mm.

A ladder climbing system must be fitted to:

- fixed ladders over 3m (where practicable)
- fixed ladders less than 3m high, where a potential fall is 3m or greater (such as where the base of the ladder is located near an edge from which someone could fall to a lower level)
- other ladders, where indicated by a risk assessment

A ladder cage should not be installed where a ladder climbing system is provided (cages do not provide sufficient protection from falls and can make rescue difficult).

A ladder climbing system shall not be fitted to internal ladders inside water tanks, wet-wells, surge vessels or similar structures where the atmosphere or contents of the vessel will cause damage to, or affect the structural integrity of the ladder climbing system.

Ladders for emergency use, which are not used for primary access, need not have a ladder climbing system installed. They shall be sign posted as 'emergency exit'.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 34 of 40

Ladder climbing systems shall comply with *AS/NZS 1891.3 Industrial fall arrest systems and devices – Fall Arrest Devices* and *AS/NZS 1891.4 Industrial fall arrest systems and devices – Selection, use and maintenance*.

Walkways and platforms

Walkways and working platforms are used for access and egress to site, and to provide a stable work platform for workers, material and equipment. Walkways and platforms must be stable and strong enough for their intended uses and provide protection from slips and falls.

The design of walkways and platforms shall consider the range of uses and activities likely to be conducted from the walkway or platform over the life of the asset.

Walkways and working platforms shall comply with *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*.

Protection of holes and openings

Holes and openings through which a person could fall or receive a serious injury must be protected.

Different types of holes and openings require worker access for different reasons. Examples are valve pits, access chambers, wet-well access openings, tank hatches, and openings caused by the removal of grid-mesh flooring.

The appropriate control to be applied depends on the nature of the asset, the fall risks, and the types of work conducted. Effective controls may include a mix of covers, grates or edge protection.

Examples of how openings can be protected include:

- a grate covering a valve pit, drain, or duct
- a cover with a removable grate beneath – where frequent surface work can be conducted while leaving the grate insitu by opening the cover only (i.e. entry to the cavity is not required)
- a cover only – where frequent internal access to the cavity is required rather than surface only access – i.e. a grate is not required as the workers will always be anchored to the fall protection system for entry into the cavity
- no cover or grate – where permanent edge protection is used, such as around a valve pit, or in low fall risk situations

Holes and openings into which someone could fall, exceeding 200mm by 200mm (or 200mm diameter) but less than 2m by 2m or 2m diameter, shall be protected by one or more of the following as appropriate:

- protective covers
- temporary edge protection with a safety grate
- permanent edge protection without a safety grate.

Where protection by a physical barrier, such as a grate, is not possible, workers shall be protected by a fall injury prevention system.

Protective covers (i.e. covers intended for fall prevention) shall be made of a material of adequate strength to prevent entry of objects or persons, and be fixed securely.

Protective covers shall comply with load and deflection criteria in *AS 1170.1 Structural design actions - permanent, imposed and other actions*.

A safety grate shall be considered for the following situations:

- To protect an opening, such as a drain, wet-well opening, open tank hatch, or opening caused by the removal of grid mesh flooring.

Rev. no.	Doc No.	Doc Owner	Version Date	Doc Approver	
8	PRO-00015	Manager Health, Safety & Wellbeing	24/06/2020	GM People, Culture and Safety	Page 35 of 40

- In circumstances where work could be conducted through an opening in the safety grate without needing to remove the grate (i.e. placing a safety grate in position allows the worker sufficient and safe access to the work, avoiding the need for additional fall prevention methods).

A safety grate is not required beneath a protective cover where the main reason for opening the cover is for a worker to physically enter the opening (however, the worker must be attached to a fall injury prevention system).

Unless a safety grate is designed to be walked on, it shall have a 'No Step' sign attached.

Safety grates shall comply with load and deflection criteria in *AS 1170.1 Structural Design actions - permanent, imposed and other actions*.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 36 of 40
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Appendix C – Examples of common controls for prevention of falls

Temporary Work Platforms

Scaffold

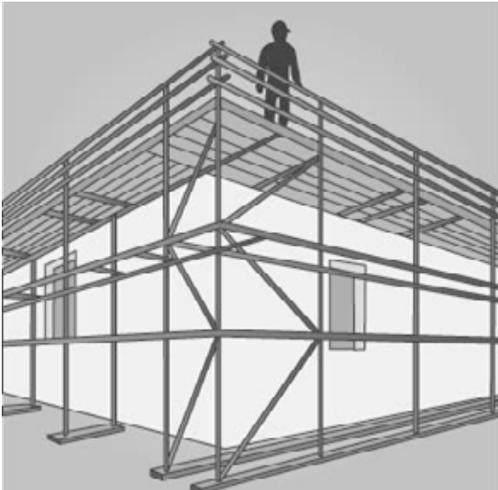


Figure 1: Perimeter scaffold with a fully decked working platform, guardrails and toeboards.

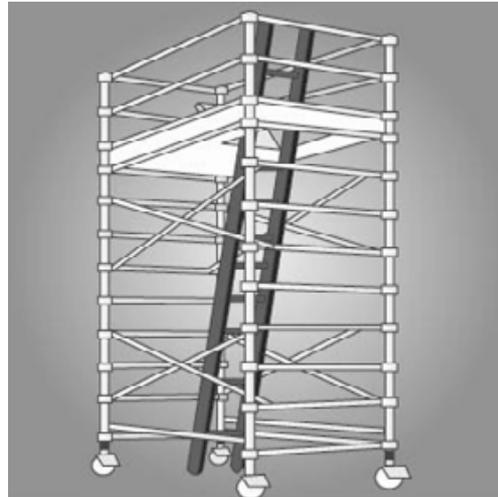


Figure 2: Mobile scaffold with an access ladder and trapdoor to provide the largest possible hazard-free working platform.

Elevated Work Platform



Figure 3: A boom-type elevated work platform. The safety harness and lanyard assembly are not shown for purposes of clarity. The lanyard should be as short as possible and should be attached directly to the designated anchor point on the elevated work platform, not to the handrail.



Figure 4: A scissor-lift elevated work platform.

Platform Step Ladder



Figure 5: A platform ladder with a safety chain provides a stable work platform that allows the use of both hands to perform a work activity.

Work Box

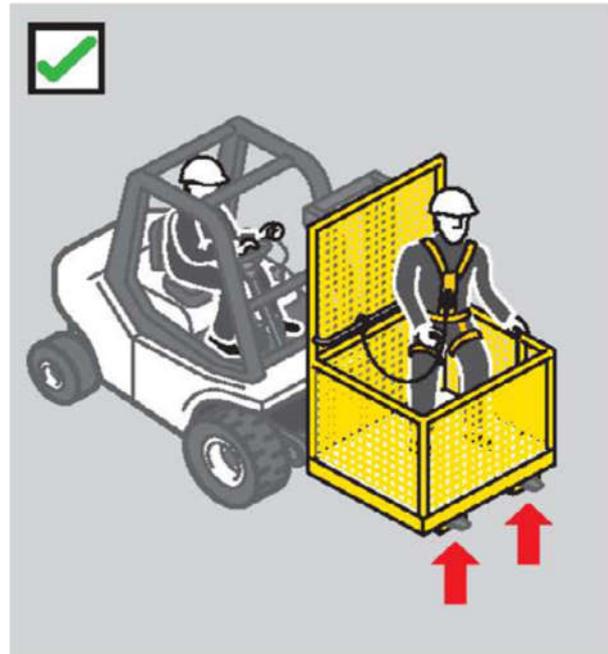


Figure 6: An engineer-designed workbox with safety harness and lanyard assembly, correctly positioned on the forklift tines.

Fall Restraint Systems

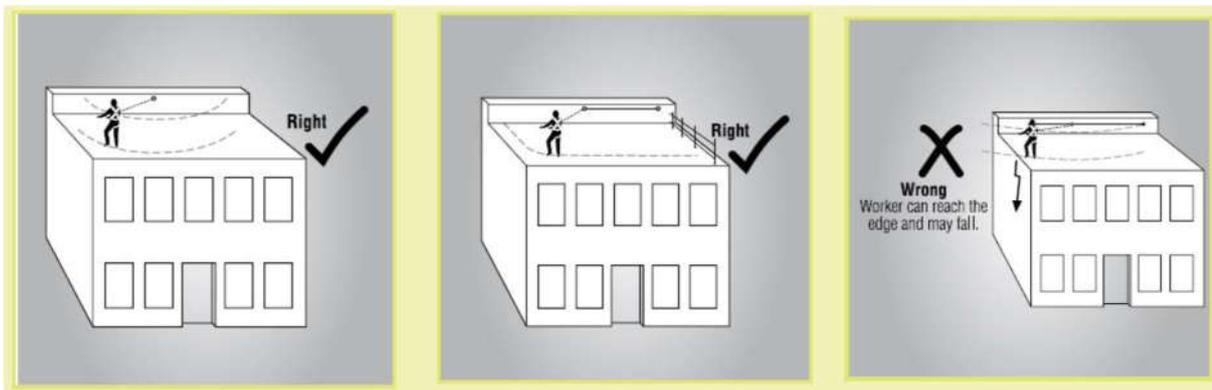


Figure 7: Fall restraint system options.

Davit Systems

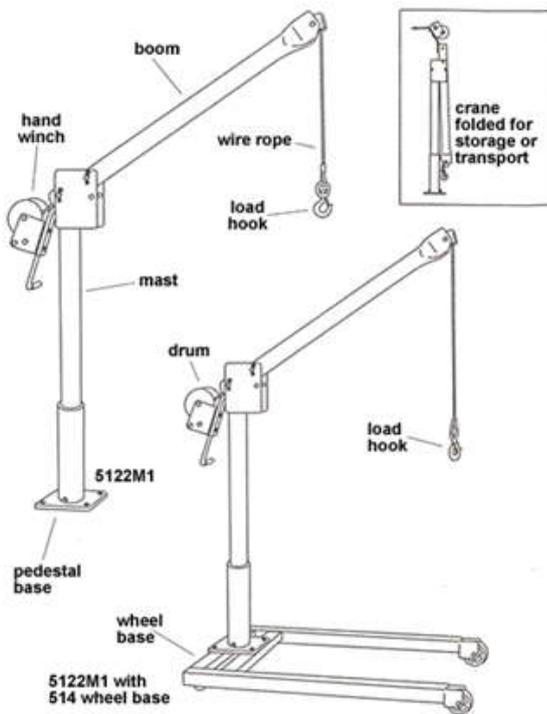


Figure 8: Portable davit lifting systems

Work Positioning Systems

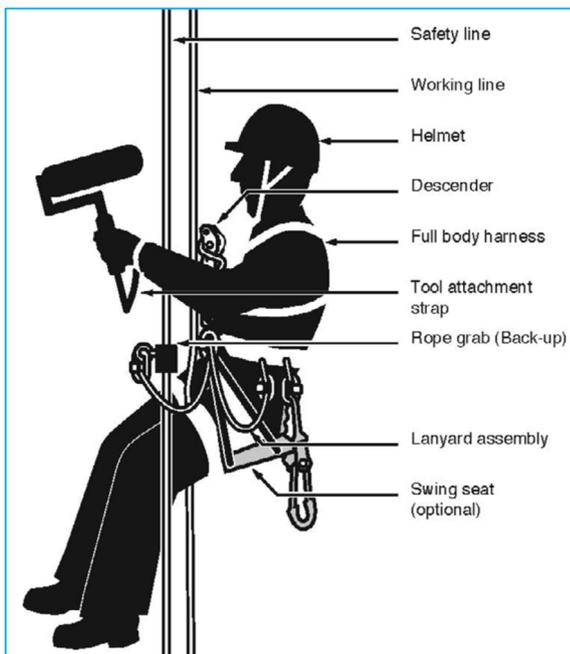


Figure 9: Operator using an ascender in an industrial rope access system.

Rev. no. 8	Doc No. PRO-00015	Doc Owner Manager Health, Safety & Wellbeing	Version Date 24/06/2020	Doc Approver GM People, Culture and Safety	Page 39 of 40
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Fall Injury Prevention Devices

Fall Arrest System

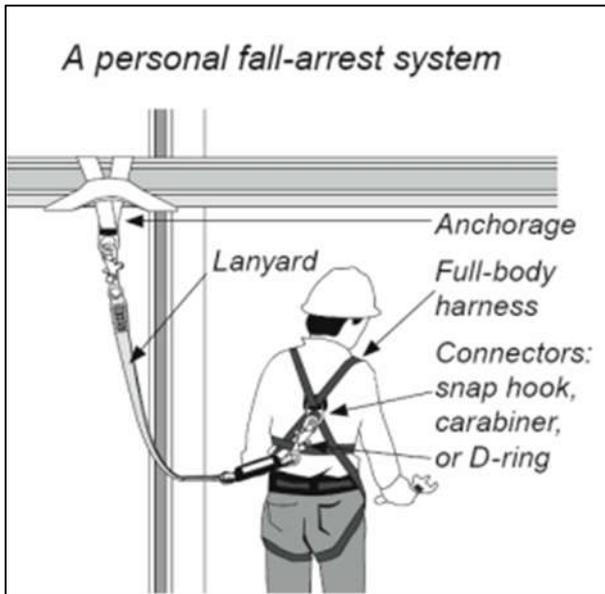


Figure 10: Personal fall arrest system

Double Lanyard System

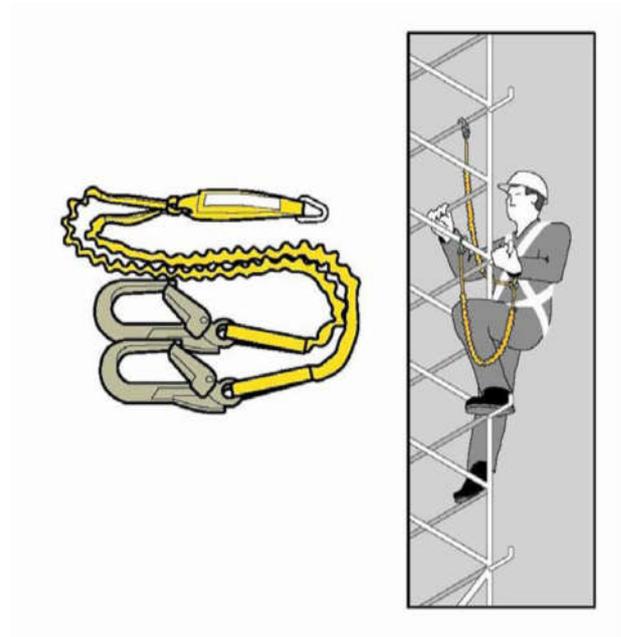


Figure 11: Above left: A double lanyard. These must have double action connectors. Above right: Person climbing with a double lanyard. Note that in this application the connectors will slide down to the lowest point on the rail and likely be subject to side loading. Side loading can be controlled by using soft connections such as slings or the use of hooks rated to withstand side loading.

Safety Net



Figure 12: A safety net in place.