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1. GENERAL INFORMATION

1.1 Purpose

This standard defines minimum requirements for the prevention of falls from height to ensure that the risk of injury is eliminated or minimised to as low as reasonably practicable (ALARP).

Working at height refers to any situation where a person working at any level has the potential to fall from, through or into any place or thing. This may occur above, at, or below ground level.

1.2 Scope

This standard is the primary corporate reference on prevention of falls from height. It describes the fundamental requirements and practical guidance for anyone responsible for decisions related to fall prevention at Water Corporation workplaces.

More detailed information about specific design or operational requirements will be found in the various subsidiary documents referenced within.

This standard is applicable to designers, and Water Corporation employees and contractors working on sites controlled by the Water Corporation. However, it is not intended to apply to greenfield construction sites. (i.e. Sites that are not controlled by the Water Corporation.)

This standard is concerned with preventing falls from height, and does not address slips, trips and falls at the same or similar level.

1.3 Applicable Legislation, Standards and Codes of Practice

Key regulatory documents relevant to fall prevention are:

- Occupational Safety and Health Act 1984
- Occupational Safety and Health Regulations 1996
- Code of Practice on the Prevention of Falls at Workplaces 2004
- Various Australian standards

For links to all documents refer to Section 6 - References.

This Standard shall take precedence where it exceeds requirements in AS 1657 or the Code of Practice on the Prevention of Falls at Workplaces.

1.4 Who to Contact for Advice

For advice on interpretation or application of this standard, refer in the first instance to the regional or branch OSH coordinator. Enquiries that require further investigation will be forwarded to the relevant business areas for consideration.
1.5 Definitions

**ALARP**
As low as reasonably practicable.

**Code of Practice**
Refers to the *WA Code of Practice for the Prevention of Falls at Workplaces 2004*.

**fall-arrestor**
A device whose function is to arrest a fall such as rope grabs, ladder climbing systems and self-retracting lifelines (inertia reels).

**fall-arrest system**
A system designed to minimise the risk of injury associated with a free fall. A fall-arrest system must be designed so that a user cannot sustain a force greater than 6 kN in the event of a fall.

**fall prevention cover or grate**
A cover or grate designed to prevent a person falling into or through an opening.

**fall-restraint system**
A system designed to prevent a user from getting into a position where a fall is possible.

**FIPS, fall injury prevention system**
A system designed to do the following:
(a) arrest a person’s fall from one level to another, or
(b) minimise the risk of injury or harm should a person fall from one level to another.
Examples of FIPS are ladder climbing system and scaffolding.

**grid mesh**
A metal or fibre-reinforced plastic panel used in the construction of walkways or platforms.

**height safety equipment inspector**
A person qualified and competent to conduct inspections and tests on fall prevention equipment. There are different requirements for different equipment. Refer to 2.7 *FIPS inspections and maintenance*.

**JSA**
Job Safety Assessment

**Kennedy barrier**
A portable barrier / guardrail system providing edge protection around entry points such as wastewater wet-wells.

**LCS, ladder climbing system**
A fall-arrest system which provides continuous fall protection for persons using ladders. It consists of a rail sleeve or cable to which an operator wearing a fall-arrest harness can connect with a short lanyard and cable grab while ascending or descending the ladder.

**OSH Act**
The *Occupational Safety and Health Act 1984*

**OSH Regulations**
The *Occupational Safety and Health Regulations 1996*

**practicable**
Means capable of being done and reasonable to do considering all factors. Also section 2.4.2.

**rated anchorage / anchor point**
An anchor point for a davit base or FIPS equipment intended for fall-restraint or fall-arrest and complying with *AS/NZS1891.4*.

**Sentinel**
Corporate hazard reporting system.

**shall**
Means *mandatory*.
### S151 Prevention of Falls

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>should</td>
<td>Means <em>recommended</em> and should be done unless there is an alternative equally <em>safe</em> or safer method.</td>
</tr>
<tr>
<td>suspension intolerance</td>
<td>(Formerly known as suspension trauma.) Potentially fatal consequence associated with a worker who has fallen while using a fall-arrest system. Following a fall, a worker may remain suspended in a harness. The sustained immobility may lead to unconsciousness.</td>
</tr>
<tr>
<td>SWMS</td>
<td>Safe Work Method Statement</td>
</tr>
<tr>
<td>worker</td>
<td>May be Water Corporation employee or contractor.</td>
</tr>
<tr>
<td>working at height</td>
<td>Refers to any situation where a person working at any level has the potential to fall from, through or into any place or thing, including falling down sloping surfaces. The situation may be above, at, or below ground level e.g. working on an elevated tank, working in or around a wastewater wet-well or working near an excavation.</td>
</tr>
</tbody>
</table>
1.6 Responsibilities

Manager Asset Management
- Custodian of S151 Prevention of Falls – responsible for maintenance of this standard.
- Monitor trends and changes and ensure the standard is maintained.

Manager OSH
- Provide consultancy to the business on fall prevention issues.
- Provide fall prevention training capability to staff.
- Monitor performance trends, changes in legislation and industry trends in fall prevention and respond accordingly, to ensure fall prevention standards and practices continue to be adequate.
- Ensure standard fall prevention equipment items are appropriate for the business, and provide advice on selection of equipment, as appropriate.

OSH Coordinators
- Provide guidance and consultancy on fall prevention issues in consultation with the OSH Prevention of Falls Consultant.
- Assist line managers and supervisors in the application of fall prevention standards and procedures.

Manager Infrastructure Design Branch
- Ensure that prevention of falls standards are reflected in design standards and standard type designs as appropriate.
- Ensure the design objective with respect to prevention of falls is to reduce the fall risk to as low as reasonably practicable (ALARP), including where practicable, elimination of the need to work at height.
- Ensure that designers consider prevention of falls throughout the life of the asset, and for all foreseeable activities and uses of the asset, during the phases of construction, operations and maintenance.
- Ensure that designers provide written information about:
  - identified hazards and their mitigation
  - methods for the safe construction, installation, and use of the designed structures and plant
  - residual risks in the design work

Manager Security Program
- Provide consultancy on security and public safety aspects associated with fall prevention.

Regional, Branch or Alliance Manager
- Ensure assets are compliant with fall prevention standards.
- Ensure appropriate resourcing of staff and equipment to meet fall prevention requirements.
- Ensure work is planned and conducted so as to reduce the risk of injury from falls to ALARP.
- Ensure interim measures are established where deficiencies have been identified.
S151 Prevention of Falls

- Monitor fall prevention performance and respond appropriately.

**Line managers / supervisors**

- Ensure compliance with working at height procedures by staff.
- Monitor work to ensure working at heights practices are being followed and take corrective action where required. e.g. correct use of FIPS.
- Ensure only appropriately qualified and competent staff work at heights. (See Section 2.5.)
- Ensure assets, equipment and PPE are compliant with this standard.

**Employees**

- Accept personal responsibility for fall prevention within their scope of control including:
  - following applicable fall prevention procedures
  - undertaking safe job planning (i.e. job hazard assessment or job safety assessment)
  - undertaking personal inspection of equipment
  - having rescue plans and equipment on site, where required
  - maintaining working at heights competency.
2. PREVENTION OF FALLS IN THE WATER CORPORATION

2.1 Policy and Principles

Fall from height risks at Water Corporation sites shall be eliminated or reduced to as low as reasonably practicable (ALARP). Workers shall be protected from falls from height and fall injuries, through the implementation of the risk-based controls defined in this document, and related corporate procedures, standards and practices.

2.2 Potential Fall Situations

Many situations at Water Corporation workplaces have the potential for a fall from height unless appropriate controls are applied. Examples are:

- use of ladders
- working on tanks, roofs and elevated platforms
- working on or from fragile roofing
- working around holes and openings such as pits and access chambers
- moving from one level to another
- removal of grid mesh flooring panels
- working on slippery surfaces
- constructing or using scaffolds
- construction of infrastructure
- working on moving surfaces
- working on large mobile equipment
- accessing utility and truck trays and trailers

2.3 Preventing Falls

The first option for preventing falls is to completely eliminate the fall risk by eliminating the need to work at height. If this cannot be achieved then the fall risks must be reduced through a mix of asset-based controls, fall injury prevention systems and administrative controls.

2.3.1 Asset-based controls

Asset-based controls are the physical asset features which reduce workers’ exposure to fall risks and provide an acceptable level of safety.

Common asset-based controls are the existence of stable working platforms and walkways, rated edge protection, and portable davits.

Asset-based controls applied in the Water Corporation are described in Section 3 - Asset Features.

2.3.2 Fall injury prevention systems

A fall injury prevention system (FIPS) is a system or arrangement designed to prevent a person falling from one level to another. FIPS includes fall-restraint systems, fall-arrest systems and scaffolding systems. FIPS or edge protection must be used where there is a risk of a person falling:

- 3 or more metres from an open edge
- 2 or more metres from a scaffold, fixed stair, landing, suspended slab, formwork or falsework, or,
- where otherwise indicated by a risk assessment.
A *fall-restraint* arrangement prevents a person from being in a position where a fall is possible. Typically the arrangement involves a person in a harness being attached to an anchored restraint line. The length of the restraint line is limited to prevent the person getting access to an open edge or hazardous area (such as brittle roof).

A fall-restraint arrangement is a lower level control on the hierarchy of controls (See Section 2.4.1), and should only be used where it is not reasonably practicable to provide a guardrail.

A *fall-arrest* arrangement prevents a person falling a great distance. It is limited to a maximum of 600 mm. The fall-arrest arrangement involves person in a harness, with a shock-absorbing lanyard, tethered to a rated anchorage. Examples of a fall-arrest arrangements are davit entry to pits or wet-wells wells, and ladder climbing systems.

Other higher level control options should be considered before using a fall-arrest arrangement. There is a risk of injury in using a fall-arrest system (e.g. suspension intolerance).

![Figure 2-1 A worker entering a pit in fall-arrest arrangement](image)

Both fall-restraint and fall-arrest systems require workers to be in a harness and appropriately secured to rated anchorages. Workers must be trained in the use of these systems before use, and must not work alone.

Fall injury prevention systems shall comply with AS/NZS 1891 series: Industrial Fall-Arrest Systems and devices.

### 2.3.3 Administrative controls

Administrative controls are the procedures that guide or direct workers to take or avoid certain actions. Examples of administrative controls are signage warning of a brittle roof, an anchorage compliance plate, and safe job planning. Administrative controls are a low-level control and would usually support other controls, or be used to control relatively low fall risks.
2.3.4 **Typical fall injury prevention controls**

Typical fall prevention controls used on Water Corporation assets are shown in Figure 2.3 below. The controls shown include asset-based controls (e.g. guardrail), FIPS (e.g. ladder climbing system), and administrative controls (e.g. exclusion zone).

![Figure 2-2 Typical fall prevention elements on an elevated tank](image)

### 2.4 Fall Risk Assessments

In general, the WA OSH legislation requires that the Water Corporation does the following to prevent falls:

- Identify each hazard to which a person is likely to be exposed in relation to falling from one level to another.
- Assess the risk of injury or harm to a person resulting from each identified hazard.
- Consider the means by which the risk may be reduced.

The appropriate means of reducing fall risk is determined by conducting a comprehensive risk assessment and choosing the most practicable controls. The risk assessment must consider multiple factors, many of which are specific to our business. The risk assessment must consider the following:

- Legislative requirements.
- The potential fall hazard.
- The frequency of exposure to the fall hazard.
• consequences of a fall
• hierarchy of potential controls that can eliminate or reduce the risk (see 2.4.1)
• recommended or standard practices applied in similar circumstances elsewhere
• practicability of the available controls (see 2.4.2)
• relative benefits, impacts and costs of the available controls

2.4.1 Hierarchy of controls for fall protection

The hierarchy of controls is an essential consideration for reducing fall risks. The hierarchy of controls is a list, in decreasing order of effectiveness, of potential types of control that can be applied to reduce the fall hazard.

The hierarchy of controls is applicable to anybody who makes decisions about the fall prevention controls to be applied. Typically this includes designers, constructors, operators and maintainers, and supervisors.

The hierarchy of control is:

• **elimination** – remove the need for the worker to be exposed to the fall risk, such as by relocating equipment to ground level
• **substitution** – substitute with a safer option such as by replacing a vertical ladder with a stairway
• **isolation** – isolate the worker from the fall risk such as by installing a guardrail or grate
• **engineering control** – engineering a solution such as a ladder climbing system or davit entry to a wet well
• **administrative control** – such as by using warning signs and defining exclusion zones
• **personal protective equipment** – gloves, hard hat, harness

Ideally the fall risk can be eliminated by eliminating the need for a worker to be in the fall risk situation at all. However, if the fall risk cannot be eliminated, then a lower level control, or combination of controls, must be applied. Generally the highest practicable level of control shall be used.

2.4.2 Practicability of risk controls

The practicability of all the potential risk controls must be considered to ensure that the best control is chosen. The best control is the most appropriate solution considering all factors and is not determined from any single factor alone.

The best solution is determined by objectively assessing the risk, and considering the total benefit and cost of implementing a given control. A practicable solution for one asset or situation may be different from the practicable solution for another, albeit similar, asset or situation, depending on the circumstances.

So, for a particular asset class, a specific asset, or a work situation the following factors must be considered:

• What is the severity of any injury or harm to health that may occur?
• What is the degree of risk (or likelihood) of injury or harm occurring?
• How much is known about the hazard and the ways of reducing, eliminating or controlling it?
• What is the availability, suitability and cost of the safeguards?
### 2.5 Training and Instruction

Staff who work at heights or who otherwise have responsibilities for fall prevention shall undertake the appropriate training. Applicable training courses are listed below.

<table>
<thead>
<tr>
<th>Training Course or Activity</th>
<th>Duration and Frequency</th>
<th>Who should attend</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of Fall Injury Prevention Systems (FIPS) <em>(National training competency unit RIIOHS204A)</em></td>
<td>1 day (every 2 years)</td>
<td>Mandatory for any worker who must work at height. Recommended for design engineers, construction engineers, project managers or others who require frequent site access.</td>
</tr>
<tr>
<td>2. Prevention of Falls - General Awareness</td>
<td>4 hours</td>
<td>Mandatory for operational supervisory staff <em>(Unless they have undertaken Use of Fall Injury Prevention Systems.)</em> Recommended for supervisors, line managers, planners, designers or others who need a general understanding of requirements for prevention of falls.</td>
</tr>
<tr>
<td>4. Rescue plan rehearsals on generic asset types</td>
<td>A few hours per asset type - annually</td>
<td>Workers who may need to execute a rescue plan. See <a href="#">Section 5 - Emergency Rescue</a>.</td>
</tr>
</tbody>
</table>

For course information, refer to the corporate learning directory. Bookings for courses (1) and (2) can be made via Cascade or the local training administrator (LTA).

### 2.6 Fall Prevention Equipment

Prevention of falls equipment used in the Water Corporation includes:

- anchorages
- bosun’s chairs
- static lines
- full body harnesses
- slings
- single and twin lanyards
- digital winch (person-rated)
- confined space entry spreader bars
- type 1 equipment - cable or rope grabs
- type 2 equipment - retractable lanyards or inertia reels
- type 3 (inertia reel with recovery winch)
- snap hooks
- karabiners (triple action)
- ladder climbing systems
- Sala davit arms
2.6.1 Standard equipment

Standard equipment items for use in the Corporation have been established on the corporate e-procurement system and have Material Master Record numbers. Refer to the online catalogue. Enquiries about the suitability of equipment, including potential alternative equipment, should be directed to OSH Branch.

2.7 FIPS Inspections and Maintenance

Effective fall prevention depends on the continued efficiency and durability of fall injury prevention equipment.

All FIPS equipment has inspection and maintenance requirements. Some equipment, such as chemically bonded anchorages, requires regular proof-load testing. Some inspections and servicing must be conducted by an external service agent.

General Requirements

1. Inspections, testing and maintenance shall be conducted in accordance with applicable corporate standards and manufacturers’ instructions as detailed below.

2. Inspections shall be conducted by trained and competent people.

3. All inspections, except those conducted by the height safety operator (i.e. the equipment operator), shall be documented.

   • For fixed assets refer to 4437923 S428 Maintenance Standard Prevention of Falls - Fixed Assets.

   • For non-fixed assets (i.e. harnesses, lanyards, etc.), the inspection shall be documented by the party conducting the inspection – e.g. external service provider.

4. Equipment shall be immediately withdrawn from service (including both personal and permanently installed items), in the following circumstances:

   • it has been used to arrest a fall
   • it shows any defect during operator or periodic inspection
   • a compliance plate indicates the equipment has not been inspected (e.g. an anchor point)
   • a label indicates the equipment has expired (e.g. harness)

Withdrawn equipment shall be tagged-out and appropriate action taken to rectify the problem, such as:

   • forwarding the item to a heights equipment service agent
   • replacement (and destruction and disposal of deficient equipment)
   • generating a report on Sentinel
   • generating an asset deficiency report.

Equipment Inspection for Fixed Assets

Fixed assets have defined inspection and maintenance requirements. Inspection and maintenance frequencies vary, depending on the type of equipment, frequency of use and environmental conditions.

Refer to 4437923, Prevention of Falls Equipment - Inspection, Testing and Maintenance.
### Equipment Inspection Frequencies for Personal and Common Use Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Inspection and Servicing Frequency</th>
<th>Inspection options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Personal equipment including harnesses, lanyards, connectors, fall-arrest devices including common-use devices</td>
<td>Before and after each use.</td>
<td>height safety operator</td>
</tr>
<tr>
<td>2. Harnesses, lanyards, associated personal equipment&lt;br&gt;Fall-arrest devices (inspection of external features only)&lt;br&gt;Ropes and slings</td>
<td>6-monthly</td>
<td>height safety equipment inspector or service agent</td>
</tr>
<tr>
<td>3. Fall-arrest devices (full service) e.g. Sala winch</td>
<td>As recommended by manufacturer (typically 1 year)</td>
<td>service agent</td>
</tr>
<tr>
<td>4. Horizontal or vertical lifelines - fibre rope - webbing</td>
<td>6-monthly</td>
<td>height safety equipment inspector or service agent</td>
</tr>
<tr>
<td>5. All items of personal and common use equipment</td>
<td>On entry or re-entry into service</td>
<td>height safety equipment inspector or service agent</td>
</tr>
<tr>
<td>6. All items which have been stressed as a result of a fall</td>
<td>Before further use</td>
<td>or service agent</td>
</tr>
</tbody>
</table>

### Inspection Roles

**Height safety operator** – An employee or contractor who is competent to perform harness-based work at heights. This is someone who has completed the competency training module *Use of Fall Injury Prevention Systems*, in the last 2 years.

**Height safety equipment inspector** - A person who is competent in the skills needed to detect faults in height safety equipment and to determine remedial action. This may be the equipment operator or other person (e.g. storesperson) who, as a minimum:
- has completed the competency training module *Use of Fall Injury Prevention Systems*, in the last 2 years
- is familiar with manufacturers’ requirements for the equipment being inspected.

**Service agent** – a height safety equipment service agent (i.e. an external height specialist company).

### References

- 4437923  Prevention of Falls Equipment - Inspection, Testing and Maintenance
- 6037565  Ladder Climbing System - Installation Testing and Maintenance Procedure
- 5314857  SWMS-083  Inspecting a Harness on Site
3. ASSET FEATURES

3.1 General

This section describes the common fall prevention controls, physical attributes and design considerations applicable to infrastructure assets. This section has an assets focus. Operation aspects such as elevating work platforms and portable ladders, are described in Section 4 – Operational Considerations.

3.1.1 Asset design

Eliminating the risk if possible

During asset design, consideration must always be given to eliminating fall risks. Where the risk cannot be eliminated, the safest practicable solution must be chosen.

Site access by other parties

Consideration should also be given to asset features associated with other parties who may access a Water Corporation site such as related to:

- areas accessible to the public e.g. observation platforms
- access and egress for emergency services
- sites at risk of attracting trespassers e.g. high structures

3.2 Access to and Egress from Work Areas

Arrangements shall be provided for safe access to, egress from, and movement around the work area. This requires consideration of aspects such as:

- walkways
- stairways
- ladders
- fixed and temporary work platforms
- fall injury prevention systems
- requirements for the movement, storage and use of equipment and tools
- the safety of work surfaces
- signage
- lighting

3.2.1 Selection of an appropriate access or egress method

In general, the preferred means of access and egress to a worksite, in priority order, is:

- level walkway
- sloping walkway
- stairway
- fixed inclined ladder
- fixed vertical ladder
- portable ladder (See 4.3 Portable Ladders)

See further information in the following sections.

The appropriate access or egress method for a specific asset will depend on the circumstances. However the highest practicable level of protection shall be used.
3.2.2 Security, public safety and emergency access

Security, public safety and emergency access requirements shall be considered when designing the access and egress method.

References

GX54 planset – Security and General Fencing
1052757 DS62 Guidance Notes for Security Treatments
DS62 – Standard Security Treatments (Restricted access – contact the Security Program Manager)

3.3 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.

Requirements

1. Where permanent access is required to another level 3 m or greater, an access stairway shall be provided, where practicable.
2. Where access is required to another level less than 3 m, a stairway shall be provided where indicated by a risk assessment.
3. Where a stairway is not practicable, the next highest control measure shall be provided. See Section 3.4 Fixed Ladders.
4. Access ladders on existing assets shall be upgraded to a stairway, where indicated by a risk assessment.
5. For assessing practicability, see Section 2.4.2.

References

AS1657 Fixed Platforms, Walkways and Ladders

3.4 Fixed Ladders

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

Requirements

1. 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.
2. Where a fixed ladder is not practicable, an alternative safe access method shall be chosen such as portable davit. See Section 4.9 Davit Systems.
3. The preferred type of ladder, in priority order is: step ladder, inclined rung ladder then vertical rung ladder.
4. Generally, fixed ladders shall not be provided for access into wet-wells, valve pits, access chambers and other below-ground structures. The provision of a fixed ladder shall be based on a risk assessment. Also see (5).

5. Wastewater pump stations without a non-fail isolation valve or penstock shall have an access ladder installed.


7. For ladder climbing systems refer to Section 3.5 – Ladder Climbing System.

References

AS1657 Fixed Platforms, Walkways and Ladders

3.5 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 600 mm.

![Figure 3-1 A cable grab on a ladder climbing system](image)

Requirements

1. A ladder climbing system shall be fitted to:
   - fixed ladders over 3 m, where practicable
   - fixed ladders less than 3 m high, where a potential fall is 3 m 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

2. 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.)

3. A ladder climbing system shall not be fitted to internal ladders inside water tanks, wet-wells, surge vessels or similar structures.
4. Ladders for emergency use, which are not used for primary access, need not have a ladder climbing system installed. They shall be signposted ‘emergency exit’. Refer to 384149_S197 Site Security Public Safety Signage.

5. Ladder climbing systems shall comply with AS/NZS 1891.3 and AS/NZS 1891.4.


7. Ladder climbing systems shall have an anchor point compliance plate fitted. Refer to 4437923_Prevention of Falls Equipment - Inspection, Testing and Maintenance.

8. Ladder climbing systems shall be maintained in accordance with 4437923_Prevention of Falls Equipment - Inspection, Testing and Maintenance.

References

6037565_Ladder Climbing System - Installation Testing and Maintenance Procedure
4437923_Prevention of Falls Equipment - Inspection, Testing and Maintenance
AS/NZS 1891.3  Industrial Fall-Arrest Systems and Devices: Fall-Arrest Devices
AS/NZS 1891.4  Industrial Fall-Arrest Systems and Devices: Selection, Use and Maintenance

3.6 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.

Requirements

1. 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.


References


3.7 Grid Mesh Flooring

Grid mesh is used for flooring on walkways, access ways and working platforms. To avoid severe fall hazards, grid mesh flooring must be correctly designed, installed, used and maintained. Also see Section 4.5 Grid Mesh Flooring.

Requirements

1. Grid mesh flooring shall be designed and constructed in accordance with 3889754_DS100 Suspended Flooring (Grid Mesh and Chequer Plate)

References

589724 OSH Handover Report Guideline
6960011 SWMS-095 Grid Mesh - General Awareness
3.8 Edge Protection

Edge protection guardrailing is a barrier which prevents a worker accessing an open edge or opening where there is a risk of a fall. Guardrails usually consist of handrails, midrails and toeboards.

Edge protection is a key component of fall prevention and is applied extensively throughout Water Corporation workplaces.

Generally a fall risk exists if a worker can approach within 2 m of an open edge or other fall hazard, such as a fragile roof. However this minimum approach distance must be increased where there are additional risk factors such as a windy location, or a sloping, slippery or uneven surface.

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

Edge protection has specific design requirements.

3.8.1 Guardrails

1. A guardrail (or alternatively a fall injury prevention system - see 3 below) shall be provided:
   - where there is risk of falling 3 m or more
   - where otherwise indicated by a risk assessment.

2. A guardrail shall be provided where there is a risk of falling 2 m or more from the edge of a decking, fixed stair, landing, scaffold, suspended slab, formwork or falsework.

3. Where guardrailing in (1) 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 guardrailing exceeds the benefit.

   See Section 2.3.2 - Fall Injury Prevention Systems.

4. Where a fall hazard exists at the entry points to an asset (e.g. roofs or wet well), guardrailing shall be provided for a minimum distance of 2 m on each side of the entry point.

5. Guardrailing around hatches and similar openings shall fully surround the opening. (Except for the access point with self-closing gate.)

6. Guardrailing shall be applied to regular work platforms and walkways where there is a fall risk within 2 m of the platform or walkway. e.g. a work platform on top of a tank located within 2 m of an open edge or fragile roof.

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

   e.g. On a tank roof, guardrailing would typically only be provided at locations where there is a significant fall risk - i.e. at the roof access point, or around a work area within 2 m of an open edge or other fall hazard.

   Edge protection would generally not be provided to protect a wider zone, such as the complete roof circumference, where only infrequent access to the area is required.

   Should it be necessary for a worker to access an unprotected area, such as approach within 2 m of an open edge, appropriate alternative controls must then be applied. Alternative controls include an elevating work platform, fall-restraint tethering and /or control zones.
8. A self-closing gate shall be installed 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

9. Guardrailing on surfaces with less than 15° pitch shall be constructed to withstand 55 kg (0.55 kN) applied at any point on the guardrail. (For roofs with greater than 15° pitch refer to AS1657 Fixed Platforms, Walkways and Ladders.)

10. Guardrail design shall consider the expected range of work activities conducted over the life of the asset, and the integrated operation of the infrastructure and equipment, such as:
    - ladder access to the work platform
    - the location and uses of davits
    - access for workers and equipment to openings and hatches
    - transport and use of tools and equipment
    - rescue and emergency access capability.

11. Where guardrails are required on steel structures or tilt up structures, where practicable, they shall be installed at ground level prior to lifting the structures into place.

12. Guardrails shall comply with AS 1657 Fixed Platforms, Walkways and Ladders, and AS 4576 Guidelines for Scaffolding, as appropriate.

References

AS1657 Fixed Platforms, Walkways and Ladders
AS4576 Guidelines for Scaffolding

3.8.2 Portable barriers

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

References

3622815 SWMS-027 Set-up of Kennedy's Portable Barrier System
2697886 SWMS-004 Removing an Access Chamber Cover
Protection for 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, edge protection or FIPS.

It is preferred that openings are protected by a physical fall barrier, rather than by FIPS as it is a higher level of control.

Examples of how openings can be protected:

- 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 FIPS 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

General requirements

1. Holes and openings into which someone could fall, exceeding 200 mm by 200 mm (or 200 mm diameter) but less than 2 m by 2 m or 2 m 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

2. Where protection by a physical barrier, such as a grate, is not possible, workers shall be protected by a fall injury prevention system. See Section 2.3.2 - Fall Injury Prevention Systems.

Protective covers

1. 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.

2. Protective covers shall comply with load and deflection criteria in AS1170 (set) Structural Design actions - permanent, imposed and other actions.

Safety grates

1. 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
   - 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.)
2. 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.)

3. Unless a safety grate is designed to be walked on, it shall have a No Step sign attached. See Section 3.12.

4. Safety grates shall comply with load and deflection criteria in AS1170 Structural Design actions - permanent, imposed and other actions.

**Edge protection**

1. Generally, openings larger than 2 m x 2 m or 2 m diameter shall have edge protection installed, or workers must use FIPS. See Section 3.8.1 - Guardrails.

**References**

*AS 1170 (Set) Structural Design actions - permanent, imposed and other actions*

### 3.10 Anchorages

Anchorages are secure points of attachment for fall injury prevention equipment: static lines, restraint systems, ladder climbing systems, and davit arms. The following types of anchorages are used:

- permanent fixed anchor
- temporary anchor such as a temporary roof anchor or sling
- davit base
- ladder climbing system

Anchorages have specific design and usage requirements.

The anchorage compliance plate indicates the inspection and test status of the anchorage.

**Figure 3-3 Anchor Point Inspection and Testing Compliance Plate**

**Requirements**

1. Anchorages shall be designed, manufactured, constructed, selected and installed in accordance with AS/NZS 1891.4 Industrial Fall-Arrest Systems and Devices: Selection, Use and Maintenance.

2. For frequent work, permanent anchorages shall be established where possible.
3. For infrequent work, temporary anchorages may be established, such as slings around structural sections and temporary roof anchors.

4. Single point anchorages (for single person attachment) shall have an ultimate strength of at least 15 kN (1500 kg).

5. Double anchorages (for two person attachment) shall have an ultimate strength of at least 21 kN (2100 kg).

6. For anchorages for static lines refer to manufacturers’ requirements.

7. Where practicable, anchorages shall be designed such that they do not require regular proof-load testing e.g. flush mount davit bases.

8. Permanently fixed anchorages shall have an Anchor Point Inspection and Testing Compliance Plate (see Figure 3.3 above) displaying inspection and test status.

9. Permanently fixed anchorages shall be inspected, tested and maintained by competent personnel in accordance with 4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance.

References

AS/NZS 1891.4 Industrial Fall-Arrest Systems and Devices: Selection, Use and Maintenance

4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance

3.11 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 in the Water Corporation. Davit systems include the davit base, davit arm, digital winch for raising and lowering, and a recovery winch with inertia reel (type 3 winch).

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

Davit systems have defined design and maintenance requirements.

Requirements

1. The permanent davit base and supporting structures shall be capable of sustaining a fall-arrest ultimate load of 15 kN (1500 kg) applied at the suspension point of the davit.

2. Davit bases shall be located with regard for all intended uses, including consideration of the relationship to adjacent equipment and infrastructure such as valves, hatches and guardrails, and accessibility for proof-load testing.

3. Davit bases shall have an associated Anchor Point Inspection and Testing Compliance Plate fitted. Refer to 4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance.

4. Where practicable, davit base anchorages shall be designed such that they do not require regular proof-load testing e.g. flush mount davit bases.

References

4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance

3622838_SWMS-029_Set up of Portable Sala C Base

3629693_SWMS-030_Set up of Portable Sala Davit arm
3.12 Signage

Signage is an administrative control which may be required in some circumstances. Applicable signage types are:

- Keep Off Brittle and Fragile Roof
- No Step
- Control Zone
- Emergency Exit
- Exclusion Zone
- Safety Harness Must be Worn

For further details of signage refer to 384149_S197 Site Security Public Safety Signage.

References

384149_S197 Site Security Public Safety Signage
4. OPERATIONAL CONSIDERATIONS

4.1 General

This section describes the application of the various fall prevention methods in the operational context. Refer also to Section 3 - Asset Features for asset-related features.

The effectiveness of any fall prevention controls depends on the correct understanding and use by workers. Staff working on and around these assets must be familiar with the fall hazards and the applicable fall prevention controls, whether these are asset-based, FIPS or administrative controls.

This section describes the most common fall prevention situations likely to be encountered but cannot describe all situations. Workers must conduct their own fall risk hazard assessment for their individual circumstances and apply the appropriate controls.

4.2 Fixed Ladders

Fixed ladders are a means of providing access to and egress from a work location. Step ladders are preferred, followed by inclined ladder then vertical ladder.

Generally, fixed ladders are not to be used as a work platform.

Requirements

1. Fixed ladders 3 m or higher shall be used with fall prevention equipment: ladder climbing system, or by being tethered to a fall-arrest system.
2. A twin lanyard may be used temporarily where a ladder climbing system is not available. Refer to 4814692 SWMS-085 Use of Twin Lanyards for Ladder Climbing
3. Workers shall be trained in the use of ladder climbing systems before use.
4. The ladder and ladder climbing system shall be inspected by the operator before use.
5. The worker shall maintain three points of contact at all times.
6. A ladder may be used as a work platform for light duty work in the following circumstances:
   - the work can be conducted safely using one hand while maintaining 3 points of contact at all times
   - the work does not require a high degree of leverage force
7. Where the integrity of an existing fixed ladder is uncertain, an alternative means of entry / access shall be used, such as by bosun’s chair ascent, by rated workbox, or by portable ladder with FIPS.
8. Ladders or ladder climbing systems with a deficiency shall be tagged out and the deficiency reported and rectified. See Section 2.7 (4).

References

4868521 SWMS-084 Safe Use of Ladder Climbing Systems
4814692 SWMS-085 Use of Twin Lanyards for Ladder Climbing
6902367 B-Safe Rope Grab Instruction Manual
4.3 Portable Ladders

Portable extension or single ladders are generally only to be used as a means of access or egress. Generally, portable ladders are not to be used as a work platform.

Requirements

Portable ladders shall be used under the following conditions:

1. Alternative safer methods have been considered such as:
   - an elevating work platform
   - a scaffold
   - a permanent ladder bracket and edge protection (where frequent access to a work level is required)
   - a platform ladder

2. The ladder is only used for access and egress or for very light-duty work. (See 3)

3. A ladder may be used as a work platform for light duty work in the following circumstances:
   - the work can be conducted safely using one hand while maintaining 3 points of contact at all times
   - the work does not require a high degree of leverage force.

4. The type and length of the ladder are appropriate for the task.

5. The ladder is in good condition.

6. The ladder is placed in a safe working position.

7. The ladder is secured to the structure where possible.

8. The ladder is used correctly.

9. The worker is positioned inside the stiles.

10. The ladder is not left unattended in a public place.

11. Portable ladders comply with AS 1892.5 Portable ladders Part 5: Selection, safe use and care.
4.4 Step Platforms and Trestle Ladders

Requirements

1. Alternatives to trestle ladders shall be considered, such as an EWP or mobile scaffold.
2. Trestle ladders shall only be used for light duty work.
3. The minimum width of the work platform shall be 450 mm.

4.5 Grid Mesh Flooring

Requirements

1. Flooring panels shall be securely fixed and assembled in accordance with 3889754 DS100 Suspended Flooring (Grid Mesh and Chequer Plate).
2. Each panel shall be securely fixed to the supporting structure before the next panel is placed in position.
3. Where practicable, panels should be fitted to a structure prior to the structure being lifted into its permanent position.
4. Grid mesh, installed as part of a new asset or major asset upgrade, shall be inspected during the final OSH inspection for the project, prior to handover to the Water Corporation. Refer to 589724 OSH Handover Report Guideline.
5. Where grid mesh panels are removed, the opening shall be immediately protected by a suitable cover. (Also see Section 3.9 - Protection for Holes and Openings)
6. If grid mesh panels are removed, a suitable protective barrier and/or exclusion zones shall be provided if there is a risk of a fall, or where otherwise indicated by a risk assessment.

7. Reinstated grid mesh shall be assessed before use in accordance with 2776585 WC-OSH 036 Reinstated Grid Mesh Panel Assessments.


References

589724 OSH Handover Report Guideline
6960011 SWMS-095 Grid Mesh - General Awareness
2776585 WC-OSH 036 Reinstated Grid Mesh Panel Assessments
3889754 DS100 Suspended Flooring (Grid Mesh and Chequer Plate)

4.6 Edge Protection

See also Section 3.8 Edge Protection under Asset Features.

Requirements

1. Edge protection is mandatory where there is a risk of a fall from 2 m or more from a scaffold, fixed stair, landing, suspended slab, formwork or falsework.

2. Where there is no permanent edge protection provided and there is a fall risk of 3 or more metres, hard barricading, FIPS, or a work positioning system such as an EWP shall be used.

   (Generally a fall risk exists if a worker is likely to approach within 2 m of an open edge. This minimum approach distance will increase where there are additional risk factors such as wind, or a sloping, slippery or uneven surface.)

3. Where edge protection must be removed to conduct work, alternative fall prevention methods shall be employed. A JSA shall be completed for any task where edge protection is to be removed and there is a fall risk.

4.6.1 Portable barriers (guardrails)

Portable barriers are used to prevent people accessing a potential fall situation. Common barriers are the Kennedy Barrier System and the Access Chamber Protection Barrier.

Requirements

1. Portable barriers should be inspected for adequacy before use by the operator.

2. Workers shall only enter the work zone defined by the portable barrier if they are protected from a fall by one or both of the following:
   - an appropriate cover or grate over the opening
   - being tethered to a rated anchorage such as a davit arm or a compliant anchor point.
4.7 Temporary Work Platforms

Where a permanent stable platform is not available, a temporary work platform can be used, such as an elevating work platform, scaffolding, work box or bosun’s chair.

4.7.1 Elevating work platform

Elevating work platforms (EWP) are safe temporary work platforms. EWPs include scissor lifts, spider lifts and cherry pickers.

Requirements

1. The EWP shall be appropriate for the planned work. (e.g. load, reach, ground conditions)
2. The EWP shall be inspected for adequacy before use.
3. The EWP shall be used in accordance with manufacturer’s written instructions.
4. Workers shall not plan to enter or leave the EWP when elevated (except in an emergency) unless the following conditions are met:
   - there is no other safer means of access
   - a risk assessment has been conducted, including consideration of the factors in Section 5.9 of AS2550.10, and a safe work plan have been established
   - OSH Branch have been consulted
5. Operators of EWPs with working heights or boom lengths exceeding 11 metres shall have an appropriate certificate of competency.
6. Workers shall wear an anchored safety harness while in the EWP, with as short a lanyard as possible and incorporating a shock absorber. (Tethering is not required on scissor-lift platforms.) The safety harness shall be attached to the lowest level, appropriately rated anchor point as deemed by the manufacturer.

References

AS2550.1 Cranes, Hoists and Winches – Safe use – General requirements
AS2550.10 Cranes, Safe use – Elevating Work Platforms
AS1418.1 Cranes, Hoists and Winches - General requirements
AS1418.10 Cranes Including Hoists and Winches – Elevating Work Platforms
4.7.2 Scaffolding

Scaffolding can be very effective in preventing falls but has specific requirements.

Requirements

1. Scaffolding shall conform to AS/NZS 4576 and AS/NZS 1576 series.
2. Scaffolding to a height of 4 m shall be erected or dismantled by a competent person.
3. Scaffolding exceeding 4 m shall be erected or dismantled by a certified scaffolder.
4. Scaffolding exceeding 4 m shall not be altered without authority from the certified scaffolder.
5. Modular scaffolds shall be of the same type - not mixed components from different manufacturers.
6. Mobile tower frame scaffolds can be used to provide safe working platforms.
7. Incomplete and unattended scaffolding shall have danger tags and warning signs attached at appropriate locations to prevent use.
8. Scaffolding exceeding 4 m in height shall be inspected and tagged by a competent person before use, after any alteration or repair, and at intervals not greater than 30 days.
9. Additional inspections should be carried out by a competent person following an occurrence such as a severe storm or earthquake.
10. Safe access to and egress from the scaffold shall be provided.
11. Edge protection (guard rails and toe boards) shall be provided at every open edge of a work platform. Meshing should be installed at locations above access and egress points.

References

AS/NZS 1576 series Scaffolding
AS/NZS 4576 Guidelines for Scaffolding

4.7.3 Mobile scaffolding

Requirements

1. A sign shall be posted indicating that only authorised staff are allowed to use a mobile scaffold.
2. The scaffold shall only be used on a hard level surface and located no closer than 1 m to any slab edge, penetration or other step-down, unless a fixed fence or guardrail is in place.
3. The scaffold shall be checked for physical defects before every use, including the access ladder.
4. The scaffold shall be level.
5. All sections shall be pinned or appropriately secured.
6. Scaffold loads shall be kept to a minimum (including tools and other equipment) and removed when the scaffold is not in use. The scaffold’s working load shall not be exceeded. (Refer to the manufacturer’s manual.)
7. Heavy tools, equipment, and supplies shall be hoisted up rather than being carried up by hand.
8. Castors shall be locked or chocked against any possible movement. Castors shall comply with AS 1576.2 and shall be capable of being locked when work is being performed from the scaffold.
9. Where the castors incorporate adjustable legs, the gradient of the surface shall not exceed 5 degrees, unless provision is made to take the load off the castors during use of the scaffold.

10. Where practicable, an appropriate exclusion zone shall be established around the scaffold while in use.

11. Guardrails and toe boards shall be in place on all open sides.

12. A scaffold shall never be moved while someone is on it.

13. Materials shall be secured before a mobile scaffold is moved.

14. Loads and tools shall be removed after using the scaffold.

4.7.4 Workbox

A work box is a personnel carrying device suspended from a crane for the purpose of providing a safe working platform or for conveying personnel, tools and equipment.

Requirements

1. Other temporary work platforms such as scaffold or EWP shall be considered before using a work box.

2. The following details shall be checked. (These details should be found stamped on the work box or on a data-plate permanently attached to the work box in accordance, with AS1418 Part 17):
   - maximum hoisted load (kilograms)
   - safe working load (kilograms)
   - tare mass (kilograms)
   - minimum allowable (rated) crane capacity (kilograms)
   - identification reference

3. The work box shall be fitted with a rated anchor point for the number of people to be carried.

4. Workers shall wear an anchored safety harness and shortest possible lanyard, unless the work box is fully enclosed.

5. The work box, lifting attachments and records shall be checked before use.

6. Workers shall not leave the work box while it is elevated unless a risk assessment has been conducted (except in an emergency).

7. The crane shall be fitted with the means to safely lower the work box in an emergency or a power failure.

8. The crane shall be suitably stabilised at all times.

9. The crane shall have drive-up and drive-down controls on both the hoisting and luffing motions, and those controls shall be used. There shall be no declutching allowing free-fall while the work box is in use.

10. An effective means of communication between the crane operator and the worker(s) in the work box shall be provided.

11. The crane shall be fitted with a safety hook and be moused accordingly.

12. The crane operator shall remain in the crane at all times.

13. The work box shall not be suspended over persons.
4.8 Anchorages

The correct selection and use of anchorages for tethering of fall-restraint and fall-arrest systems is critical for their safe operation.

General

1. Workers must be trained and competent to use FIPS. Refer to Section 2.5 - Training and Instruction.
2. Workers shall be tethered to appropriate rated anchor point(s) before being exposed to a fall hazard.
3. Fall-arrest anchorages shall be chosen that are as close as practicable to directly above the place of work, to minimise the shock in the event of a fall. (Not applicable to anchorages in EWPs. See Section 4.7.1 - Elevating work platform)
4. Workers shall confirm there is adequate fall clearance below the anchor point.

Permanent anchorages

1. The Anchor Point Inspection and Testing Compliance Plate shall be checked prior to each use.
2. Anchorages shall be visually inspected for adequacy by the equipment operator before and after each use.
3. Deficient anchorages or anchorages overdue for testing shall be tagged out and not used, and the deficiency reported. See Section 2.7 (4).
4. For inspection and test requirements refer to 4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance.

Temporary anchorages

1. Temporary anchorages may be established for infrequent work where it is impracticable to provide a permanent anchorage. However, an alternative access method should be considered.
2. Consideration shall be given to employing a height safety service provider to establish temporary anchorages.
3. Temporary anchorages shall be established and used by appropriately trained and competent people, in accordance with manufacturers’ instructions.
4. The anchorage shall have a minimum ultimate strength of 15 kN (1500 kg) for a single person anchorage, or 21 kN (2100 kg) for a double person anchorage.
5. Slings, ropes and webbing shall be protected in all situations where abrasion or cutting could lead to failure.
6. Where there is doubt about the suitability of an anchorage, the anchorage shall be assessed by an engineer or a suitably qualified height professional.

References

4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance
4.9 Davit Systems

1. Davits shall be used in accordance with manufacturer's instructions.
2. Users of davits for personnel entry and rescue shall be appropriately trained.
3. The Anchor Point Inspection and Testing Compliance Plate shall be checked prior to use. Davits shall not be used for personnel if the compliance period has expired or there is no compliance plate.
4. The davit and associated equipment shall be inspected by the worker prior to each use.
5. Deficient davits and associated equipment shall be tagged out and the deficiency reported and rectified. See Section 2.7 (4).
6. Davits and bases shall be tested and maintained in accordance with 4437923, Prevention of Falls Equipment - Inspection, Testing and Maintenance.

References

7096381, Prevention of Falls Equipment - Inspection, Testing and Maintenance
3622838, SWMS-029, Set up of Portable Sala C Base
3629693, SWMS-030, Set up of Portable Sala Davit arm

4.10 Working On and Around Pump Wells, Valve Pits and Similar Assets

Working near the openings of pump wells, access chambers, valve pits and similar structures has fall risks. There is a potential to fall into the structure or a fall while inside the structure itself. Fall prevention systems for use around these structures include the following:

- permanent edge protection
- a personnel exclusion barrier (e.g., Kennedy's Barrier System)
- a protective grate over the opening
- a davit system, or work box and crane for personnel entry

Entry to wet-wells and similar structures must also comply with confined space entry requirements.

Requirements

1. Workers shall be protected from falls from height at all times.
2. The need for worker access to a wet well or access chamber shall be avoided if practicable.
3. Fall prevention equipment includes:
   - covers and grates
   - guardrail or portable barrier system around the opening
   - fall-restraint or fall-arrest system
4. FIPS shall be applied where:
   - a well or chamber cover needs to be opened more than 200 mm and the opening is not protected by a fall prevention grate
   - a fall prevention grate is in place but needs to be removed or opened to conduct the work
5. The approved means of access into a the well, pit or access chamber are:
   - dual winch system with a bosun's chair
   - dual winch system with a spreader bar
6. Existing ladders and step irons in wet-wells and access chambers shall only be used as a secondary access method and for worker stabilisation. (Primary access and worker support shall be via one of the methods in 5.)

References

2697886 SWMS-004 Removing an Access Chamber Cover
3622764 SWMS-026 Tethering Around a Wet Well Pump Station
7406902 Access into Wet Wells or Access Chambers - Guidelines

4.11 Working On and Around Tanks, Roofs and Similar Assets

Working on tanks and roofs and similar elevated structures typically has the following fall hazards:

- falls during access and egress
- falls from the roof or platform
- falls through an unstable or fragile roof structure
- falls through skylights
- falls into open hatches
- falls within a tank itself.

Methods used to prevent falls on these assets are:

- safe access and egress systems such as stairways and ladder climbing systems
- edge protection around access points, working platforms and hatches
- safe access walkways
- stable work platforms
- signage to indicate hazardous areas and access constraints e.g. brittle or fragile roof
- davit systems
- capacity for alternative access, egress or work platforms e.g. such as EWPs
- anchor points for personal FIPS

The fall controls required at a specific asset depend on the nature of the work, the fall risks, and the existence or otherwise of suitable asset-based fall prevention controls (e.g. edge protection).

Requirements

1. Workers shall be protected from falls from height from roofs at all times.
2. Workers shall not work on a roof alone.
3. The stability of the roof surface for the intended work shall be assessed prior to access.
4. No access is permitted closer than 2 m from an unprotected edge, opening or fragile roof unless the worker is appropriately tethered to a fall-restraint or fall-arrest system.

Additional controls may be required for higher risk situations such as for:

- slippery or uneven roof surfaces
- sloping roof exceeding 15°
- working near unprotected openings in the roof surface such as skylights
- existence of other physical hazards (e.g. wind, glare, equipment existing at the lower level increasing the impact of a fall injury)
4.12 Working Around Excavations

Where excavations are created, appropriate control measures must be employed to ensure the safety of workers and the public from falls into excavations. An excavation is any hole resulting from the removal of earth or rock, etc.

The appropriate controls depend on the circumstances, including:

- work location
- size of the excavation
- duration of the excavation work.

Controls which may be employed are: fencing, barricades, bunting, barrier mesh, scaffolding, benching, ramps, signage and sentry.

Requirements

1. Workers and the public shall be protected from falls from height at all times.
2. Access to the excavation area and directing of pedestrian flows shall be controlled by appropriate barricades, fencing and signage.
3. Safe access and egress to the excavation shall be provided such as by ramp, scaffolding or lashed ladder. A lashed and anchored portable ladder may be used for access and egress.
4. For requirements for public safety around excavations refer to S152 Public Safety at Construction Sites.

References

Code of Practice: Excavation (2005)
S216 Excavations
S152 Public Safety at Construction Sites

4.13 Working Around RF Communications Equipment

Communications equipment on Water Corporation assets generates radio frequency (RF) fields which may be hazardous. This equipment may be owned by the Water Corporation or operated and maintained by other organisations such as Telstra, police and CALM.

Sites where RF fields may be present include high-level water tanks, towers and elevated steel structures, and other assets where space has been leased to other organisations.

Requirements

Workers shall observe safety procedures for working in the vicinity of radio frequency equipment. Refer to 6410437 Radio Frequency Radiation Safety Procedure.

References

6410437 Radio Frequency Radiation Safety Procedure
Third Party Access Protocols, Property Management – Business Services Group
4.14 Working Around Non-Water Corporation Assets

Where there is potential for a fall from height when working at premises or on assets owned by others, such as when sampling trade waste, appropriate fall prevention controls shall be established commensurate with the risk. Typical controls are edge protection, covers and grates.

Establishing these controls may require negotiation with the asset owner.
5. **EMERGENCY RESCUE**

Appropriate rescue procedures must be in place for the rescue of a person in an emergency situation. Possible rescue scenarios are rescuing a worker from within a wet-well or an elevated tank.

An appropriate and well-rehearsed rescue plan will help ensure there is an appropriate response in an emergency situation to provide the best possible outcome. Reliance alone on emergency services is not an adequate rescue plan.

**Requirements**

1. Where it is reasonably foreseeable that performing a task may place workers in an emergency situation, an appropriate rescue plan shall be established prior to commencing the work.

2. Relevant supervisors shall ensure that situations needing a rescue plan are identified through the safe job planning process.

3. A rescue plan shall contain:
   - details of the asset / site
   - how the person is to be rescued
   - equipment required
   - communications details
   - personnel requirements (numbers and skills required)
   - responsibilities
   - requirements for rehearsals

4. Rescue plans shall be rehearsed annually.

5. Workers shall be provided with appropriate information and training so they are competent to execute the plan in an emergency situation.

**References**

4614553  Rescue Planning Guideline

7584548  Rescue Plan Tracker
6. REFERENCES

Maintenance

4437923 Prevention of Falls Equipment - Inspection, Testing and Maintenance
6037565 Ladder Climbing System Installation - Testing and Maintenance Procedure

Occupational Safety and Health

6902367 B-Safe Rope Grab Instruction Manual
2697886 SWMS-004 Removing an Access Chamber Cover
3622764 SWMS-026 Tethering Around a Wet Well Pump Station
3622815 SWMS-027 Set up of Kennedy's Portable Barrier System
3622838 SWMS-029 Set up of Portable Sala C Base
3629693 SWMS-030 Set up of Portable Sala Davit arm
5314857 SWMS-083 Inspecting a Harness on Site
4868521 SWMS-084 Safe Use of Ladder Climbing Systems
4814692 SWMS-085 Use of Twin Lanyards for Ladder Climbing
6906011 SWMS-095 Grid Mesh - General Awareness
2776585 WC-OSH 036 Reinstated Grid Mesh Panel Assessments Procedure
7406902 Access into Wet Wells or Access Chambers - Guidelines
367451 S152 Public Safety at Construction Sites
384149 S197 Site Security Public Safety Signage
4614553 Rescue Planning Guideline
7584548 Rescue Plan Tracker
6410437 Radio Frequency Radiation Safety Procedure

Design Standards

168446 DS51 Design and Construction of Wastewater Pumping Stations and Pressure Mains 4.5 to 90 Litres per Second Capacity
1596772 DS61 Water Supply Distribution – Tanks
DS62 – Standard Security Treatments (Restricted access – contact the Security Program Manager)
1052757 DS62 Guidance Notes for Security Treatments
3889754 DS100 Suspended Flooring (Grid Mesh and Chequer Plate)

Standard Drawings

Security and General Fencing - Planset GX54
Prevention of Falls Equipment - Planset IP76

Legislation and related documents

Occupational Safety and Health Act 1984
S151 Prevention of Falls

Occupational Safety and Health Regulations 1996
Occupiers’ Liability Act 1985
Code of Practice: Excavation (2005)

Referenced Australian Standards

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Document Revision History

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<tr>
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<td>First issue</td>
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