



# DHW Technical Guideline

## TG006 Roof Access

### 1. Purpose

This guide assists agency representatives, consultants, and project managers to procure safe roofs and design roof access systems for routine maintenance.

### 2. Methodology

Safety is everyone's business. Safety and health legislation is complex and there is an overlap regarding the duty of care of designers, employers and contractors. There is an onus on building designers, building owners, persons conducting a business or undertaking (PCBUs), building managers, supervisors, manufacturers, suppliers, maintenance personnel and workers to ensure, as far as reasonably practicable, that hazards and risks to a person's health and safety are avoided.

A safe design approach, comprehensive consultation, risk management processes, and good planning ensure that construction, renovation, servicing, maintenance or repair of roofs, plant or equipment on a building or structure can be undertaken in a safe manner.

### 3. Requirements for DHW non-residential projects

#### 3.1. Design to avoid roof access requirements

From the commencement of project design, including works to existing buildings, consultants are to apply planning and design strategies to eliminate the requirement to access roofs for routine maintenance wherever possible.

In principle, equipment and plant must be located on the ground or in dedicated plant rooms to provide easy and safe access for ongoing maintenance requirements. This principle applies to all non-residential government buildings.

In addition DHW does not support the use of internal box gutters or "concealed gutters". Eaves gutters are the standard gutter type. To facilitate access to those gutters for cleaning from ground level (for example, via ladder or elevated work platform), designs should include paving and hardstand within perimeter landscaped areas.

To design out opportunities for unauthorised access to the roof, careful consideration should be given to the placement of items such as gates, fences, and other potentially climbable features.

## 3.2. Planning requirements for roof access systems

When locating plant or equipment on a roof is unavoidable, roof safety systems should not be overly complicated and should generally only be located to the areas of a roof where access for routine maintenance is required.

### 3.2.1. Design considerations

Roof safety and fall prevention systems require regular maintenance, inspection, and re-certification for continued use, create multiple penetrations of the roof sheet, and have the potential to create accelerated corrosion of the roof sheeting by galvanic corrosion if not properly installed.

In consideration of this, DHW's strong preference is that the installation of elements, such as roof anchor points, be minimised wherever possible and limited only to the extent required to facilitate routine maintenance, such as the maintenance of mechanical plant and equipment, high level glazing, gutter cleaning where it cannot otherwise be accessed from ground level, and the like.

Consultants shall determine the frequency of access required for maintenance in discussion with the relevant discipline(s) having jurisdiction over the plant and/or equipment requiring the maintenance. The agreed frequency shall then inform the type of access provided. DHW recommends using the principles for maintenance access from NATSPEC's TECHreport TR07 Providing Access for Maintenance clause 3.1.2 Frequency of Access, as described in Tables 1 and 2.

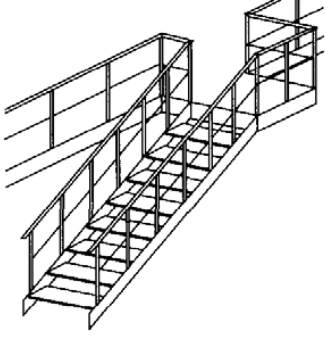
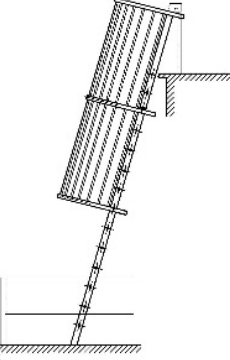
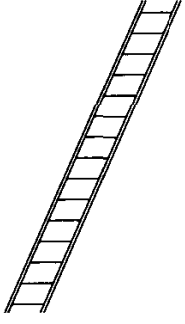
**Table 1 - Types of access by frequency**

<b>Frequent maintenance</b>	<b>Occasional maintenance</b>	<b>Infrequent maintenance, repairs or replacement</b>
Readily accessible	Semi-clear access	Limited access
Frequency: items requiring access for maintenance monthly or more often	Frequency: items requiring access for maintenance between monthly and six monthly	Frequency: items requiring access for maintenance less frequently than six monthly
Access class A	Access class A or B	Access class A, B or C

**Table 2 - Access classification**

<b>Access class A</b>	<b>Access class B</b>	<b>Access class C</b>
Clear and immediate access to and around plant items	Platform accessible by non-vertical ladder	Temporary access
If more than 2 m above the ground, floor or platform: Provide a platform with handrails accessible by a stair, all to AS 1657	If more than 2 m above the ground, floor or platform: Provide a platform with handrails accessible by a non-vertical ladder, all to AS 1657	Locate so that temporary means of access conforming to Work Health and Safety regulations can be provided

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 <p>Access from floor or ground level or from walkway or platform and stairs to AS 1657.</p>	 <p>Access from walkway or platform and inclined ladder to AS 1657.</p>	 <p>Access using portable ladder or other means conforming to Work health and Safety regulations.</p>
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Plant or equipment should not be positioned close to roof edges, or on steep roofs, and should consider any other potential risks to installation and maintenance providers. Maintenance walkways, platforms, and ladders should, wherever possible, be placed on internally facing roofs and located to minimise their visual impact. Maintenance walkways should be raised sufficiently to avoid trapping debris and use non-penetrating fixing methods to preserve the integrity of the roof sheeting.

The roof access point should be located as close as practicable to the area of maintenance concerned to minimise the distance of travel required and the extent of the roof access system itself. More than one access point (particularly for ladder access) may be considered appropriate in this regard.

Access points such as roof hatches and access ladders should be appropriately secured by locking mechanisms or other security features to prevent unauthorised persons accessing the roof.

### 3.2.1.1. Existing buildings

Consultants shall assess the existing roof safety and fall prevention systems on buildings proposed to be altered, extended or having its roof replaced to determine if the existing system needs to be modified. The Consultant shall consider Section 3.2.1 design considerations and wherever possible, ensure the proposed design minimises the installation of any new roof-mounted equipment.

If the existing system does not meet the current codes or standards, the Consultant shall refer the matter with the DHW Project manager for direction.

### 3.2.2. Design & documentation

A design and construct (D&C) approach for procuring a safe roof access solution by the Contractor is NOT permitted. The Consultant shall carry out full design, documentation, and certification including for roofs that are being altered, extended or replaced on existing buildings.

### **3.2.3. Height safety and access management consultant**

Where a height safety and access management (HSAM) consultant is appointed for the design and specification of roof access systems, engagement should occur at the early stages of a project. Early engagement ensures planning and design decisions made during schematic design and design development are informed and well considered, risks are removed or mitigated where possible, and a safe roof access strategy is developed appropriately.

### **3.2.4. Safety in design consultation**

The project's design safety report assessment shall include roof safety.

The Australian Standard AS/NZS 1891.4:2009 *Industrial Fall-Arrest Systems and Devices*, Clause 2.1.1, defines the following considerations which should be made during risk assessment:

#### **3.2.4.1. Work type**

- What parts of the roof will need access for maintenance work?
- How long will task take?
- How often is task required?

#### **3.2.4.2. Potential for a fall and fall severity type**

- Potential for a fall and fall severity
- What parts of the roof are a fall hazard? (For example, unprotected edges, fragile surfaces, holes, steepness of pitch)

#### **3.2.4.3. Task mobility**

- How many people are required to do the work?
- How will workers access the area where work is to be done?

#### **3.2.4.4. Constraints on fall distances and clearances**

- What are the vertical and lateral clearances?

Anchor points require regular inspection and maintenance in accordance with AS/NZS 1891.4:2009. The risk assessment process should consider that additional and unnecessary anchor points will increase the requirements for inspection and maintenance.

Maintenance personnel are responsible for providing their own compliant fall arrest equipment that is compatible with the installed system, and in compliance with AS/NZS 1891.4:2009. They are also responsible for ensuring that all anchor points are inspected for compliance and certified prior to use.

**3.2.5. Structural considerations & certification**

Roofs shall be designed to specified structural loads, including live loads. The roof structure to 'trafficable' zones and equipment locations may require additional strength or bracing. The Consultant shall liaise and coordinate with the Structural Engineer as necessary.

A structural engineer shall be engaged to provide the information necessary to ensure the adequacy of the structure that will accept the installed roof access system.

The Consultant shall provide a structural engineer's certification for anchorage points and other access fixtures as part of the tender documentation.

**3.2.6. Testing & certification**

The roof access, fall arrest and fall prevention systems, fixed platforms, walkways, stairways, and ladders are to comply with:

1. The approved design and specification,
2. AS 1657, AS/NZS 1891, and AS/NZS 5532, and
3. Are to be certified by the Installer as having been installed in accordance with Australian Standards and the Manufacturer's requirements.

Any items to be installed on the roof in cyclonic regions (comprising of Regions B, C and D), including roof access systems, are required to have evidence of recognised cyclone test certification. Certification should establish the performance of the complete assembly (as it will be installed) for concentrated loads, wind pressure (including fatigue loading for cyclonic areas) and water tightness.

**3.2.7. Practical completion – certification**

Prior to the issue of the Certificate of Construction Compliance and Practical Completion, the Contractor shall inspect and certify the completed roof access system to confirm compliance with the documented design and specification.

**3.2.8. Practical completion – O&M manuals**

The Contractor shall submit the Operation and Maintenance (O&M) Manuals prior to Practical Completion. They should contain all the technical specifications, operating and maintenance instructions, and certificates of compliance for all roof access and fall prevention systems installed on the project.

All certification and warranty periods shall be valid from the date of Practical Completion, such that the Principal has the full benefit of warranty and certification periods commencing on their possession of the building.

One copy of the O&M Manuals should be retained on site by the building manager for future reference by roof safety inspectors at regular intervals during the building's operations.

Documents in the O&M Manuals must include, but are not limited to, the following:

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1. A printed copy of the manufacturer's manual/s for all fixtures,
2. The manufacturer's certificate of fabrication in accordance with the relevant Australian Standard (for example, under AS/NZS 5532),
3. An independent inspector's certificate where applicable,
4. The installer's certification that the completed installation is in accordance with Australian Standards and the manufacturer's requirements, and
5. As-constructed drawings of the entire roof safety system.

## **4. Summary of design responsibilities and deliverables**

### **4.1. Schematic design**

- Apply planning and design strategies to eliminate the requirement to access the roof for routine maintenance to the full extent possible.
- Engage Height Safety & Access Management consultant (HSAM), if required.
- Commence design safety consultation to the extent possible.

### **4.2. Design development**

- Appropriately brief subconsultants (for example, mechanical, landscaping) to apply planning and design strategies to eliminate the requirement to access the roof for routine maintenance to the full extent possible.
- Formal design safety consultation. Recommend consultation includes designer/s, HSAM consultant, DHW project manager, customer agency, and maintenance contractor/personnel.
- Identify and include proposed safe roof/height access strategy and extent in the Design Development Report.
- Inclusion of design safety report within Design Development Report submission to BTS for review.

### **4.3. Contract documentation**

- Further design safety consultation if required between designer/s, HSAM consultant, DHW project manager, customer agency, and maintenance contractor/personnel.
- Finalise safe roof access strategy and extent.
- Prepare full and appropriate documentation for tendering and Building Permit application requirements, including a specification work section and full details for the proposed system.
- Structural engineer's certification for anchorage points and other access fixtures to be provided as part of the tender documentation.

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- Updated and consolidated design safety report within Contract Documentation Report - submission to BTS as part of design review process.
- Ensure that the design safety report is included in the tender documentation. A copy of the report is to be provided to the Principal's Representative and Contractor prior to the Contractor commencing work on the site.

### 4.4. Practical completion

- Inspection and certification of completed roof access system to be undertaken by Contractor and verified by Superintendent's Representative. The Contractor is to ensure the roof safety system has been installed as per the manufacturer's requirements.
- Operation and maintenance (O&M) manuals to include all technical specifications, operating and maintenance instructions, and certificates of compliance for all roof access and fall prevention systems.

## 5. References

### 5.1. Statutory requirements

Safety and health in Western Australian workplaces are regulated by Western Australia's *Work Health and Safety Act 2020* (the WHS Act).

Under the WHS Act, there are three types of instruments to help meet workplace health and safety obligations, namely Regulations, Australian Standards (AS) or Australian/New Zealand Standards (AS/NZS), and Codes of Practice.

#### 5.1.1. Regulations

The WHS Act is supported by three sets of regulations which specify the way in which some duties under the WHS Act must be met, and prescribes procedural or administrative requirements to support the WHS Act:

1. Work Health and Safety (General) Regulations 2022
  - Applies to all workplaces except those covered by the other two sets of regulations (WHS General Regulations)
2. Work Health and Safety (Mines) Regulations 2022
  - Applies to mining and mineral exploration operations (WHS Mines Regulations)
3. Work Health and Safety (Petroleum and Geothermal Energy Operations) Regulations 2022
  - Applies to onshore and offshore petroleum, pipeline and geothermal energy operations (WHS PAGEO Regulations).



### 5.1.2. Codes of practice

A code of practice is a document prepared to provide practical guidance on how to comply with a general duty or specific duties under Western Australian work safety and health laws. A code of practice may include explanatory information, recommendations for best practice, or references to occupational safety and health laws. While duty holders must comply with the underlying occupational safety and health laws, the preventative strategies outlined do not represent the only acceptable means of achieving a certain standard.

Codes of practice approved under the WHS Act include:

- Managing the Risk of Falls at Workplaces (Department of Mines, Industry Regulation and Safety 2022), and
- Safe Design of Structures (Department of Mines, Industry Regulation and Safety 2022).

## 5.2. Safe Access, Standards and Compliance

The National Construction Code (NCC) and Australian Standards should be complied with to the full extent applicable when designing roofs and safe roof access systems.

The **NCC** in clauses D2D21 and D3D23 (NCC 2022) of Volume One (non-residential buildings) provides for compliance with AS1657 for access ways to machinery rooms, plant rooms and the like.

**AS 1657:2018 *Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation*** sets out the requirements for design, selection, construction, and installation, and is intended to provide safe access to places used by operating, inspection, maintenance, and servicing personnel.

**AS/NZS 1891.4:2009 *Industrial Fall-Arrest Systems and Devices – Selection, Use and Maintenance*** sets out the required specification for the selection, safe use, and maintenance of industrial fall arrest systems and devices based on the use of safety harnesses, horizontal static safety lines and rails, fall arrest devices, and associated lanyards, connectors, anchorages, and fittings.

**AS/NZS 5532:2013 *Manufacturing Requirements for Single Point Anchor Devices Used for Harness-Based Work at Height*** establishes parameters for the manufacturing of anchor points as stated.

## 5.3. Others

NATSPEC TECHreport TR07 *Providing Access for Maintenance* October 2023



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