

Optimal Access

A Guide to Specifying Quality Access Ladder Systems



Introduction

The risks of working from heights cannot be understated. According to Safe Work Australia, falls are among the leading causes of injuries and deaths in occupational settings.¹ Between 2015 and 2019, 122 workers were killed following a fall from heights, with 16% of that figure being accidents involving ladders.²

In Australia, workplace safety law has established that it is the primary obligation of employers to provide a safe work environment, including providing safe means of accessing elevated workspaces. Accordingly, the specification of access ladders is an essential component to a workplace's safety system for any work involving heights.

Access ladder specification can be difficult for designers and specifiers. Access ladders for safety applications are subject to a range of building regulations, safety legislation and Australian standards. Not all access ladders are the same and choosing the right solution for any given project can be challenging for the uninformed. Different types of access ladders are required for different applications. The design, installation, build quality and benefits of the range of access ladders on the market vary according to the manufacturer. Some access ladder solutions can also be combined with additional safety equipment to meet the requirements of different jobs.

It is up to specifiers to be informed of what to look for so that the access ladder provides the level of safety and performance required for the proposed application. Not only will this prevent accidents and avoid liability, but it will save on the cost of replacement and refits at a later stage.

In this whitepaper, we provide a concise guide to the key design considerations when specifying access ladders. In doing so, we provide specifiers with an informed process of identifying high-quality access ladder systems that meet the specific requirements of any project.



Why Use Access Ladders?

Under work health and safety legislation, employers must guard against putting their workers at risk. Climbing or descending a ladder is inherently dangerous, particularly with tool or materials in hand. The risk of a fall is exacerbated depending on the worker's level of mobility, or if the ladder is exposed to the elements.

An access ladder is used to enable safe work that must be performed at a height. Its main purpose is to provide safe entry and egress to rooftops, raised platform, roof or attics. To this end, access ladders are designed to be more stable and easier

to use than standard ladders. They also provide fall protection in the event an accident occurs, such as with a fall arrest system, ladder lifelines and/or safety guardrails.

There are a multitude of product options on the market and the work environment may dictate that specific types of access ladders must be used to meet safety compliance requirements. The first step when specifying an access ladder is understanding the types of ladders and options available and which is best suited for the proposed application.

Types of Access Ladders

Basic, light or heavy duty

Basic and light ladders are typically made of less-sturdy materials and have lighter frames. In comparison, heavy duty ladders are often fixed, with stronger and thicker frames to accommodate heavier workloads and industrial work.

Step, angled or vertical

Step ladders are typically used for lower heights, and are safe when designed and used correctly. Such ladders will typically have a 100mm tread depth and set at an angle between 60° and 70° (65° being the preferred angle). Handrails on either side are usually included for additional support.

Angled ladders are rung ladders ideally set at an angle between 70° and 75°. Unlike a step ladder, workers use an angled ladder to climb up and access a specific work area.

A vertical ladder is a rung ladder that is set vertically. The vertical angle of the ladder makes it more difficult to climb so this type of ladder poses the highest safety risk. The Australian Standard for a vertical rung access ladder is between 70° and 90°, with the preferred gradient being at 75°. While less preferred to a tread-style access ladder, a rung-style access ladder can still afford the user safe access.

Caged or uncaged

When a ladder is of a significant enough height (typically over three metres), a ladder cage is recommended to provide additional protection against a fall, and is a requirement if there is a risk of falling six metres or more. A ladder cage is designed to enclose the climbing space and is attached to the building or ladder itself. As a worker climbs the ladder, the ladder cage provides a greater sense of security. If the worker falls or slips, the cage can help the worker regain balance and help them re-establish their foothold.

Pull-down ladders

When access is required to a space internal to the building, such as a suspended ceiling or attic, there may be a requirement calling for the access ladder to be stored away when not in use. Pull-down ladders may be specified in this case. As the name suggests, a pull-down ladder is a ladder assembly that is stored in the ceiling or attic, and can be pulled down when access to that space is needed.

Fixed or unfixd

Access ladders can be fixed into place to the ground or onto another surface in a permanent position. Fixing the ladder into place provides additional stability. Portable or unfixd ladders are less stable and require workers to be more vigilant about the risk of falling.



Quality, Performance and Safety

Choosing the Right Access Ladder

When choosing an access ladder, specifiers' focus should be on ensuring the ladder meets the needs of the work environment. High levels of product quality, reliability and performance are vital given the stakes involved. Below is a checklist of considerations when assessing potential access ladder solutions for your next project.

Durability

Often overlooked when selecting a ladder, the type of material used to manufacture the ladder can impact its suitability for a given application. Different materials have different performance profiles and properties, so some are better suited to specific environments than others. For example, exterior applications will require a ladder that is weather and corrosion resistant.

Ladders may be made out of a variety of materials including fibreglass, aluminium or steel. Aluminium is particularly advantageous in ladders due to its high inherent strength which means it is not easily damaged. Aluminium is also lightweight and easier to install than heavy weight equivalents, and does not rust or deteriorate over time.

Build quality and design

While many manufacturers will espouse the quality of their products, it is important to take steps to ensure any such claims are verified. Specifiers should verify whether the product has been sufficiently tested for durability and meets Australian and industry standards for performance.

Brand reputation and history is another factor. Consider whether the ladder has been designed and manufactured inhouse. This indicates that the company has a hands-on approach and is highly invested in the build quality of their solutions. The extensiveness of the manufacturer's product warranties should also be noted.

Different applications require specific design solutions to improve ease-of-use and installation. For example, internal roof access is often through a manhole behind a suspended ceiling. An access ladder for this application may require suspended ceiling access frames to ensure the weight of the ladder is supported by the roof, not the ceiling. For pull-down ladders, an advanced counterbalance system is used by leading manufacturers to make it easy to use while reducing wear and tear on the components of the ladder.

Load capacity

Any access ladder should have a working load limit, which is the limit of weight the ladder is designed to support safely. Consider the following general guidelines:

- Domestic ladders should be tested and rated to 100kg load capacity (at a single point, not spread weight) for single-person access.
- Commercial or industrial ladders should be tested and rated to 120kg. At greater heights, the ladder should have increased load capacity for added safety.
- Heavy duty ladders should be tested and rated to 400kg.

Fire resistance

In recent years, the National Construction Code (NCC) has imposed stricter requirements on fire safety across all building types. For fire-rated applications, the ladder should be tested for fire performance under AS 1530.4:2005 "Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance test of elements of construction" and meet the relevant requirements for fire performance for the specific building element.

The fire performance of building products is indicated by the product's "Fire Resistance Level" (FRL), which indicates the number of minutes a test specimen fulfils the three fire test criteria: structural adequacy, integrity and insulation. For example, a ladder rated "-/60/60" means the product can resist fire for 60 minutes before failing the integrity and insulation criteria. Where a dash is indicated, no requirement for the criteria applies, which is relevant to non-loadbearing systems.

Safety devices

Depending on the application, safety devices should be considered when selecting a ladder solution. Common safety devices include ladder cages, handrails, wider treads, non-slip treads, and fall arrest systems. Security features may also be required, such as lockable cages that prevent trespassers from accessing the ladder outside of work hours.

When selecting suppliers or manufacturers, consider whether they are also certified to install and test fall arrest systems, and that the systems comply with the relevant fall protection standards and legislation.

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Is It Compliant?

The design and installation of access ladders for safety applications is highly regulated. Several Australian standards, codes of practice and safety legislation need to be considered and adhered to. The primary standard is AS 1657:2018 “Fixed platforms, walkways, stairways and ladders - Design, construction and installation”. This Standard provides performance and design specifications for access ladders, including the hierarchical order in which means of fixed access should be considered. It provides specific requirements for ladder width, height and angle of slope; clearances; treads; rungs; fall protection measures; and load capacity.

Look for ladders that are specially designed to meet the specifications set out in AS 1657:2018. Each specification in the Standard must be achieved, so it is advisable to choose only manufacturers that can demonstrate that their solutions achieve compliance. Note that other standards may be relevant depending on the application, such as the AS/NZS 1891 series

covering “Industrial fall-arrest systems and devices” and AS/NZS 5532:2013 “Manufacturing requirements for single point anchor devices used for harness-based work at height”.

CodeMark certification provides another layer of assurance that the product selected is compliant, safe and manufactured to a high quality. A CodeMark-certified product has been independently tested and determined to meet with the requirements of the NCC. When selecting a ladder solution, check if the product has undergone all necessary testing by an independent body and is CodeMark certified.

There are no Australian standards directly applicable to pull-down access ladders. To ensure you avoid safety and compliance issues later on, it is advisable to specify systems that comply with the NCC as well as the specifications in AS1657:2018 where possible.

AM-BOSS Access Ladders

For over 40 years, AM-BOSS has provided high-quality, safe and compliant ladder solutions to the Australian market. With a focus on delivering the highest quality access solutions on the market, AM-BOSS offers a range of access ladders with load capacity from 150kg to 400kg (at a single point, not spread weight).

AM-BOSS ladders are fit for use in a range of spaces, heights and applications like commercial buildings, residences, factories and hospitals.

AM-BOSS ladders are built to last. Constructed using 100% Australian-welded aluminium, they are strong but lightweight and corrosion resistant. Steel parts (such as springs) are zinc-plated to extend lifespan and reduce ongoing maintenance requirements.

AM-BOSS has a team of certified technicians who can install and maintain ladders in any scenario. AM-BOSS ladders are compliant with all relevant standards, and AM-BOSS is certified to install and test fall arrest systems in accordance with the AS1891 series. The company was the first to manufacture pull-down access ladders and folding ladders that are compliant with the NCC and CodeMark certified.

AM-BOSS staff are knowledgeable in all relevant standards and guidelines and can provide guaranteed project-specific advice to designers and specifiers.

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References

- ¹ Safe Work Australia. "Working at heights." SWA.
<https://www.safeworkaustralia.gov.au/heights> (accessed 6 July 2021).
- ² Safe Work Australia. "Falls data infographic." SWA.
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All information provided correct as of July 2021