



Designing Accessible Ramps and Stairways

A Guide to Handrail Requirements in AS 1428.1:2021

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INTRODUCTION

Good environmental design means designing for all, including users with disability. In Australia, over 4.4 million people have some form of disability.¹ About one in seven people with a disability uses a mobility aid, such as a wheelchair or walking stick.²

People with impairments and mobility issues can greatly benefit from the assistance of ramps and handrails when climbing stairs or steps. Thanks to these structural features, they can reach their destination or navigate a space without worrying about tripping, falling or getting hurt in an accident.

Australian building codes, standards and regulations, such as the Disability Discrimination Act 1992 (DDA) and AS 1428.1, mandate accessibility features in public spaces and buildings. Architects and designers need to be aware of these regulations to ensure compliance with the law and create environments that are accessible to everyone.

Below, we outline the requirements that impact the design, specification and construction of ramps and stairs in public spaces, with a focus on the technical specifications for compliant handrails under AS 1428.1.





WHAT IS THE DDA?

The Disability Discrimination Act 1992 (DDA) prohibits the design and construction of public spaces that are inaccessible to people with disability. To this end, this legislation contains provisions that make the installation of handrails on wheelchair ramps and stairways a legal requirement.

The design of public structures must comply with both the DDA and the National Construction Code (NCC) in their own right. The accessibility provisions in the NCC ensure new buildings are designed and constructed in a way to enable all people to access them. The NCC includes

requirements for barriers and handrails and refers to AS 1428.1 (discussed below) in relation to the provision of access for people with a disability.

According to the DDA, public spaces must incorporate features to provide easy accessibility for all, including ramps and stairways accommodating mobility aids like wheelchairs and electric scooters. Incorporating handrails alongside ramps and stairways that conform to the appropriate specifications is essential. Structures lacking these features may require modifications in line with current accessibility standards.

WHAT IS AS 1428.1?

AS 1428.1:2021 “Design for access and mobility – General requirements for access – New building work” provides minimum design requirements for new building work, to enable access for people with disabilities. Many of the provisions in AS 1428.1 are focused on making a building easier to use and navigate by providing continuous accessible paths of travel and circulation spaces.

AS 1428.1 provides that a continuous accessible path of travel in a public space should be unobstructed and must be easily accessible to people in wheelchairs and other mobility equipment. As per the standard, accessibility

ramps should have certain lengths and slopes, and handrails should be designed and installed according to the required specifications. In addition, there must be accessible handrails with the proper handrail extensions and terminations on both sides of the stairs.

Note that AS 1428.1 sets the minimum technical details for accessibility, while other guidelines, such as the NDIS Specialist Disability Accommodation Design Standard and Livable Housing Design Guidelines, may provide even stricter requirements depending on the building type and purpose.

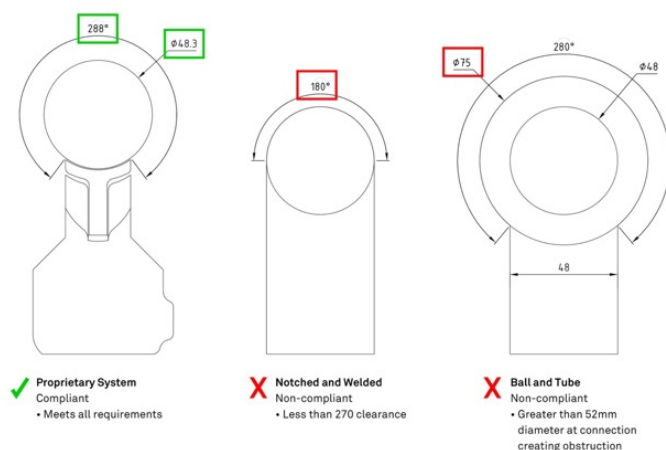
“AS 1428.1 provides that a continuous accessible path of travel in a public space should be unobstructed and must be easily accessible to people in wheelchairs and other mobility equipment.”

HANDRAIL SPECIFICATIONS

AS 1428.1 defines handrails as “a rail used in circulation areas such as corridors, passageways, ramps and stairways to assist in continuous movement”. Below are the key specifications for handrails under Clause 12 of the standard:

- **Cross-section dimensions.** The cross-section of the handrail must be circular or elliptical, with a height and width of not less than 30 mm or greater than 52 mm for 270° around the uppermost surface. The horizontal axis on an elliptical handrail must be the axis with the greater dimension. See Figure 1.

Figure 1. Handrail cross-section dimensions

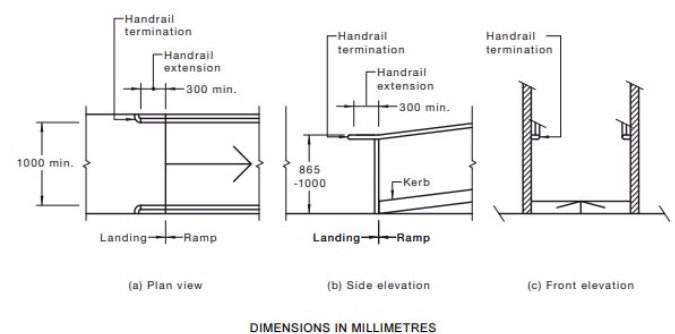


Source: <https://moddex.com>

- **Height from floor level.** The top of the handrail must be not less than 865 mm or greater than 1000 mm from the nosing of a stair or the plane of the finished floor level on a ramp, walkway or landing. The handrail's height must remain consistent along the ramp, the steps, and any landings. The height may vary in certain circumstances, such as a stairway handrail extension and handrail transitions between flights.

- **Clearspace.** A clearspace between a handrail and an adjacent wall or other obstruction must not be less than 50mm. A clearspace of 600mm is also required above the top of the handrail. Toeboards must be able to withstand a horizontal force of 100N, with no elastic deflection greater than 30mm and no gap greater than 10mm to be exposed between the inside face of the toeboard and the edge.
- **Continuous.** Handrails are to have no obstruction to the passage of a hand along the rail. Inside handrail at landings shall be continuous.
- **Circulation spaces.** Handrails and balustrades shall not encroach into required circulation space enabling persons using mobility aids to move around easily.
- **Terminations.** Suitable handrail terminations are specified in the standard. See Figure 2 for examples.

Figure 2. Examples of ramp handrail terminations



Source: Figure 15(A), AS 1428.1.

ACCESS RAMPS

A continuous accessible path is an uninterrupted route within a building that provides access to all facilities. Access ramps facilitate easy entry to elevated areas, benefiting individuals using mobility aids.

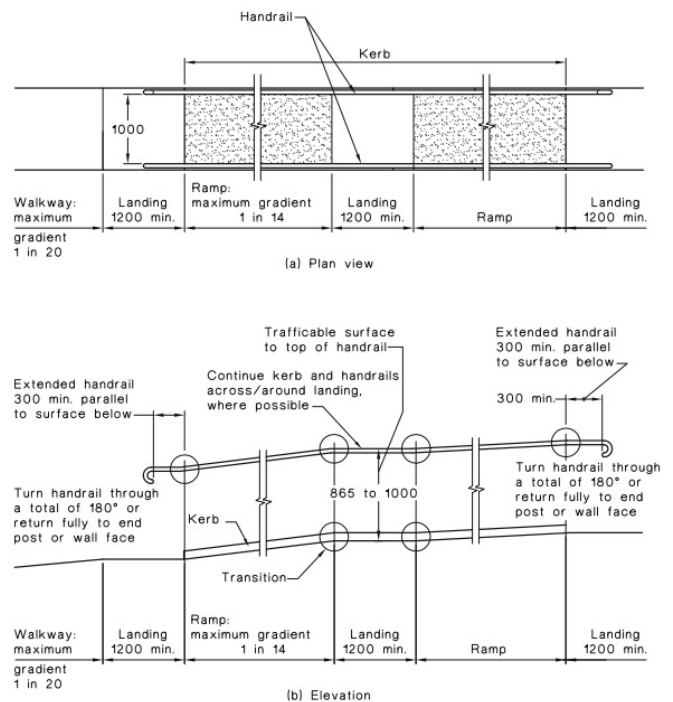
The maximum gradient of a ramp exceeding 1900 mm in length shall be 1 in 14. The gradient shall be constant throughout its length, with a maximum tolerance of 3% while not exceeding 1:14 gradient. In addition, ramps shall have landings at the start and end of the ramp, as well as at intervals not exceeding 9 m for ramps with 1:14 gradient and 15 m for ramps with 1:20 gradient.

Ramps shall have a handrail complying with Clause 12 of AS 1428.1 on each side of the ramp. In addition, Clause 10.3 of AS 1428.1 provides additional handrail requirements specific to access ramps.

- Dimensions.** The distance between ramp handrails must be a minimum 1000 mm. At the terminations of the handrail, the handrail must extend at least 300 mm horizontally past the top and bottom transition points of the ramp, unless the inner handrail is continuous at an intermediate landing. See Figure 3.
- Set back.** Where the intersection is the property boundary, the ramp shall be set back at a minimum of 900 mm so that the handrail does not protrude into the transverse path of travel. For similar reasons, if the intersection is at an internal corridor, the ramp shall be set back by a minimum of 400 mm.
- Kerbs or kerb rails.** Where the handrail is not supported on a wall, ramps and intermediate landings

shall have kerbs or kerb rail with a minimum height of 65 mm above the finished floor. The height of the top of the kerb or kerb rail shall not be within 75 mm to 150 mm above the finished floor. There shall be no longitudinal gap or slot greater than 20 mm in the kerb or kerb rail, within the range of 75 mm to 150 mm above the finished floor. Additional kerb and kerb rail requirements are set out in Clause 10.3(j).

Figure 1. Handrail cross-section dimensions



Source: Figure 14, AS 1428.1.

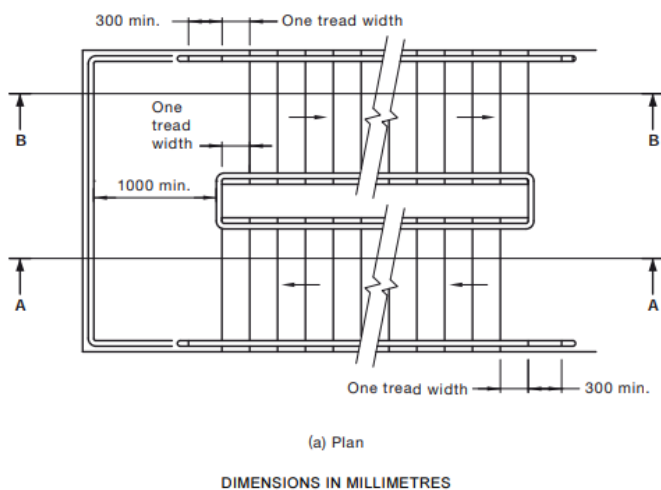


STAIRWAYS

AS 1428.1 requires stairways to have accessibility features, including handrails. As with ramp handrails, stairway handrails must comply with Clause 12 of AS 1428.1. Clause 11.2 provides additional handrail requirements specific to stairways.

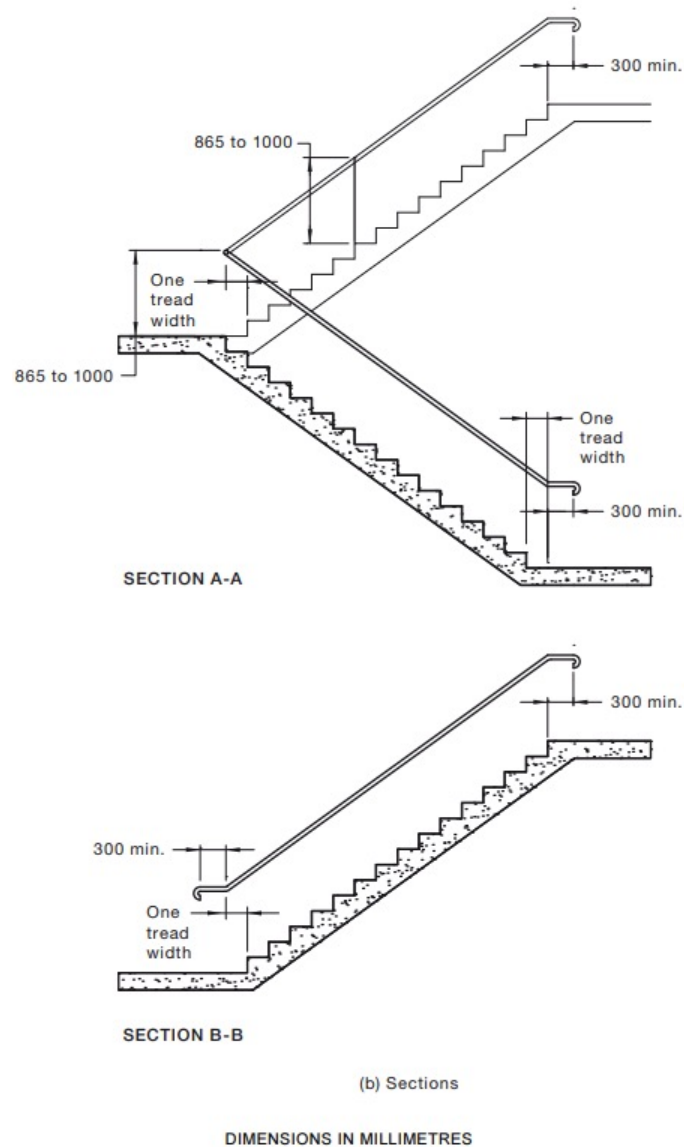
- Dimensions.** Handrails shall be installed on both sides of the stairs (a minimum 1000 mm apart). The height of the handrail shall be 865 mm to 1000 mm (taken vertically from the nosing of the tread to the top of handrail). The handrail shall extend a minimum of 300 mm horizontally past the last and top riser. See Figure 4a and 4b.
- Set back.** Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail does not protrude into the transverse path of travel. Where the intersection is not at the property boundary, the stair shall be located so that the handrail does not protrude into the transverse accessway.
- Continuous.** Handrails shall be continuous throughout the stair flight and, where practicable, around landings and have no obstruction on or above up to a height of 600 mm. Handrails shall have no vertical sections and shall follow the angle of the stairway nosings.

Figure 4a. Handrails to stairs with intermediate landings (plan view)



Source: Figure 28, AS 1428.1.

Figure 4a. Handrails to stairs with intermediate landings (sectional view)



Source: Figure 28, AS 1428.1.

“Good environmental design means designing for all.”

COMPLIANT DISABILITY AND PUBLIC ACCESS HANDRAILS

Moddex Assistrail

Moddex Assistrail disability and public access handrail systems ensure that the public and people with mobility or vision impairment can traverse your site safely and with ease. You have the backing of Moddex's technical experts who can advise on potential hazards and the best solutions.

Designed for use across ramps, stairs and walkways, Assistrail can be used in a range of applications including aged care, educational, medical, public access areas and community centres. Utilising a continuous top rail system, the flush connection provides for a smoother, safer finish.

Designers and specifiers have the peace of mind of knowing that Moddex Disability Handrails comply with the DDA and will adapt to every building classification within the NCC and the New Zealand Building Code.

With 15 configurations available in the Assistrail family, Moddex Disability Handrails offer:

- single or double rail requirements for primary and secondary schools;
- smooth and continuous top rails for compliance with AS 1428, DDA and NZS 4121:2001;
- galvanized zinc for durability and corrosion resistance; and
- fully compliant AS/NZS 1428 modular kerbrails.

Assistrail systems are also easy to retrofit, or dismantle for reconfiguration. Unlike traditional welded systems, Moddex's modular handrails cut installation times in half. All systems are delivered in ready to assemble, flat pack designed for quick and easy installation. With 100% no-weld there is no need to worry about any hot works permits, toxic fumes or site shutdowns.



Reference

¹ Australian Network on Disability. "Disability statistics." AND. <https://and.org.au/resources/disability-statistics> (accessed 20 November 2023).

² Australian Bureau of Statistics. "Use of aids and equipment by people with disability in Australia." ABS. <https://www.abs.gov.au> (accessed 20 November 2023).

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