

ADVISORY NOTE

NAN 018

Accessible Housing Solutions



Reinforcement of bathroom and sanitary compartment walls for grabrail support

Introduction

The ABCB has introduced new livable housing provisions for NCC 2022, applying to all houses (Class 1a) and apartments (Class 2). The new ABCB Livable Housing Design Standard “provides a set of technical provisions that if complied with enable dwellings to better meet the needs of the community, including older people and people with mobility limitations.”

The introduction of these new provisions is determined by the relevant state or territory authorities. Some States and Territories have decided not to introduce these requirements at this stage and other States have varying implementation dates. Check with your local authority for the relevant dates.

Part of these new provisions is the reinforcement of bathroom and sanitary compartment walls to ensure that walls adjacent to toilet pans, showers and baths provide a fixing surface able to facilitate the future installation of grabrails, if needed. Installation of grabrails is not required at the time of construction.

The location of reinforcement for fixing of grabrails is given in the next section.

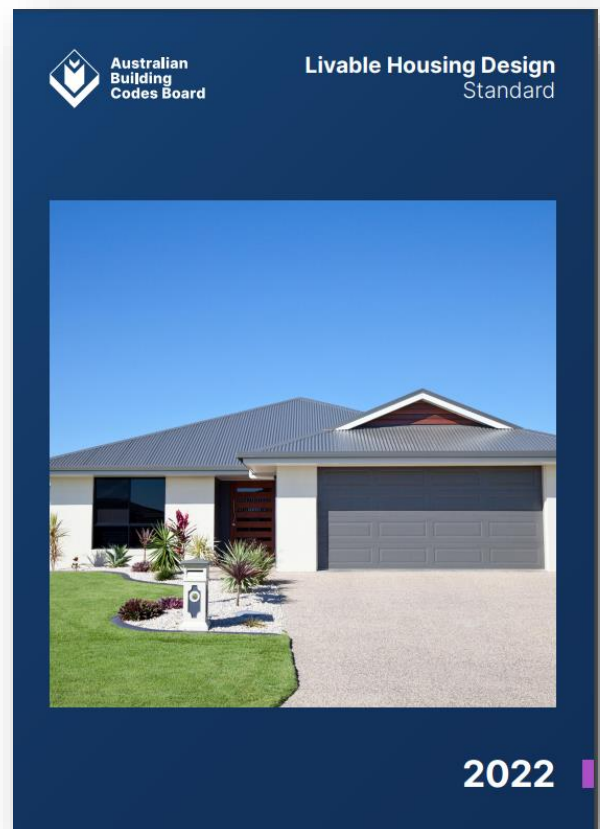


Fig. 1 - ABCB Livable Housing Design Standard

Testing was conducted to determine cost-effective solutions for steel framing to meet the requirements for grabrail attachment points. Testing was performed in accordance with AS 1428.1 Section 14 – Grabrails, which states-

“The Fastenings and materials and construction of grabrails shall be able to withstand a force of 1100 N applied at any position and in any direction without deformation or loosening or rotation of the fastenings or fittings.”

An industry solution has been developed utilising existing and readily available components, enabling fabricators to pre-install compliant and cost-effective reinforcements for grabrail attachment. Other solutions can be developed to meet the requirements of AS 1428.1.

The solutions presented in this Advisory Note use steel components. Reinforcement maybe constructed from any suitable material. However, houses constructed in bushfire areas in accordance with NASH Standard – Steel Framed Construction in Bushfire Areas, must not use combustible products in external walls.

Location of reinforcements

The following figures gives nogging locations specified in the ABCB Livable Design Standard.

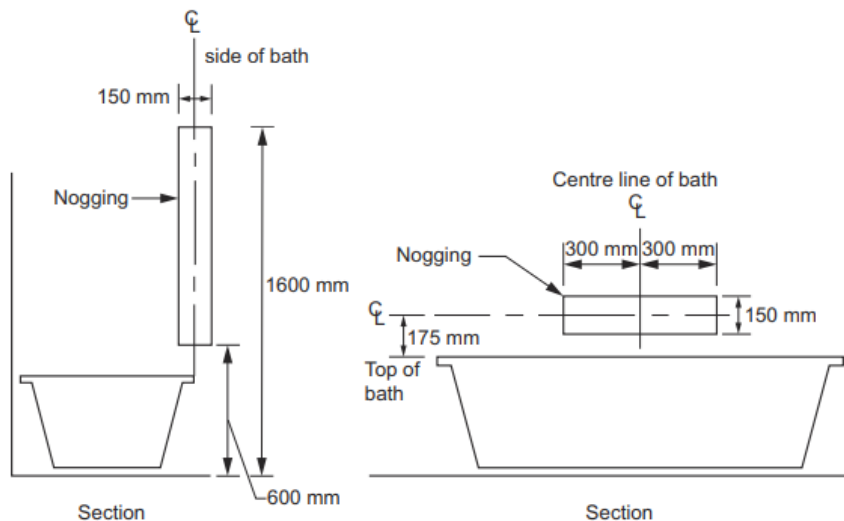


Fig. 6.2a Location of noggings for walls surrounding a bath

Notes:

1. Taps, bath niches, soap holders and the like may be located within the positions designated for wall reinforcing
2. Where the height of the bathtub is not yet known, an assumed height of 500 mm above finished floor level may be used to determine the location of wall reinforcing.

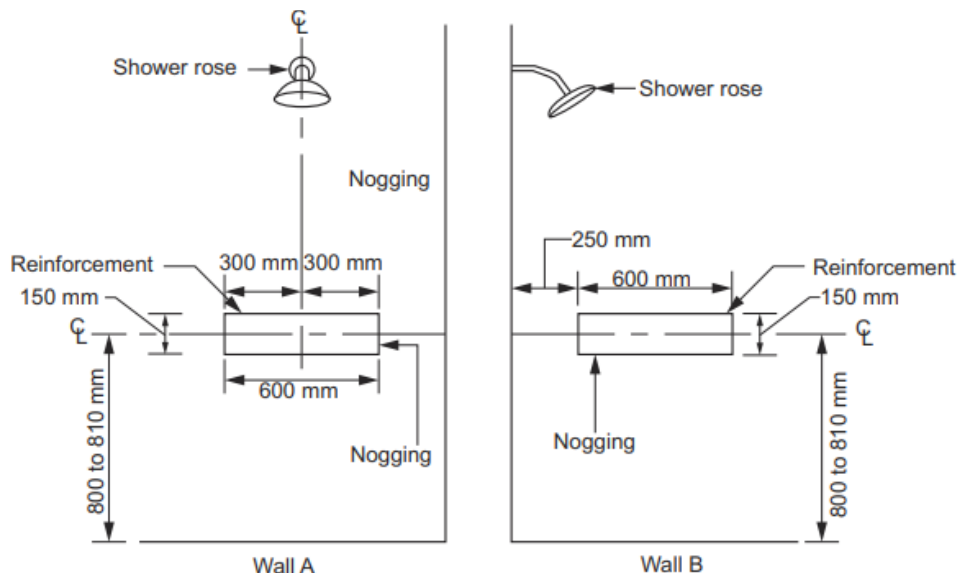


Fig. 6.2c Location of noggings for shower walls

Note: Taps, bath niches, soap holders and the like may be located within the positions designated for wall reinforcing

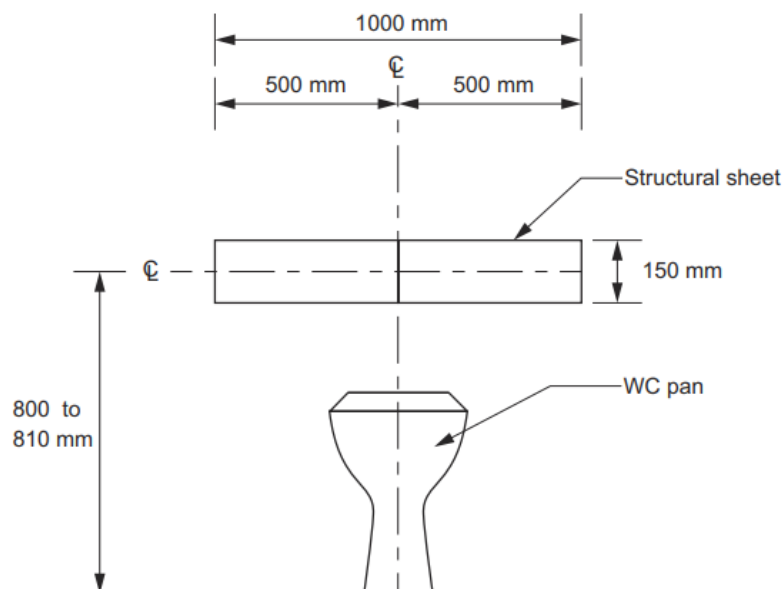


Fig. 6.2f Location of noggings for a wall behind a toilet pan

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Testing

A typical 600 mm grabrail was fixed (using type 17, 10 g x 35 mm screws) to a series of representative wall panels (2400 x 1800 mm) with varying reinforcement options. The preferred option was stacking four rows of noggings with and without a 1 mm steel sheet covering as illustrated in Figure 2. This was preferred as it provided the strength and stiffness to resist the required force from the grabrails.

Figure 2 taken for demonstration purposes - in actual testing, both attachment points were the same in each test). Framing with a base metal thickness (BMT) of 0.55 mm was used so that the 'worst case' was tested.

Wall panels were secured in a test rig equipped with a load cell and several displacement transducers. A sling attached to a pneumatic cylinder was used to apply the required force to the grabrail, simulating a person's bodyweight acting downwards. The test force is increased by the sampling factor as specified in Section 7 of NS 100 NASH Standard – Residential and Low-rise Steel Framing, Part 1: Design Criteria.

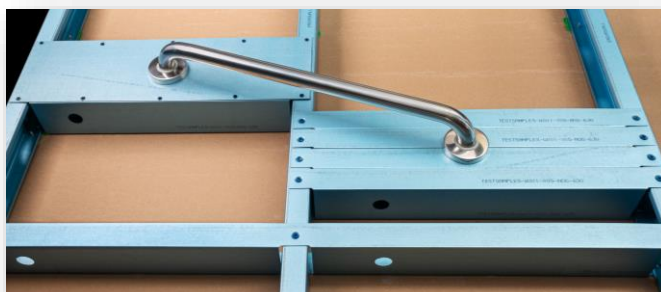


Fig. 2 Grabrail positioning on steel framed wall, with and without 1 mm sheet

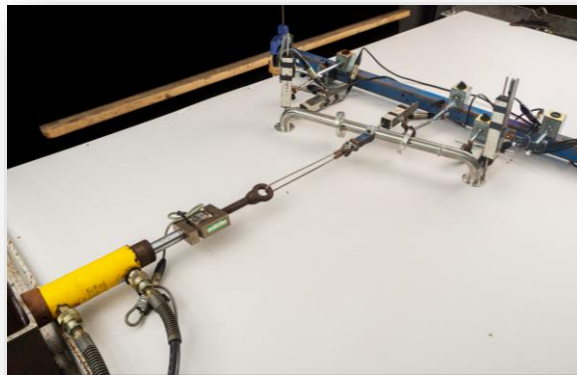


Fig. 3 Test set up with load applied to grabrail

Where noggings were used without the use of a supporting sheet were found to allow excessive deflection under load, which resulted in plasterboard cracking below the design load of 1.1 kN.

The option capable of withstanding these loads with no plasterboard cracking consists of four stacked noggings with attached 1 mm sheet. This sheet is approximately 180 mm wide, so a standard strip width can be used.

Grabrail reinforcement detail

Figure 4 shows a grabrail reinforcement solution for steel framing. The standard noggings for the framing system may be lipped or uplipped and are attached to the wall studs in accordance with the framing system requirements. The 1 mm steel sheet is attached to the top and bottom noggings with 10 g screw at 150 mm spacing. A wafer head or flat top screw should be used to allow the lining to pass over the screw head.

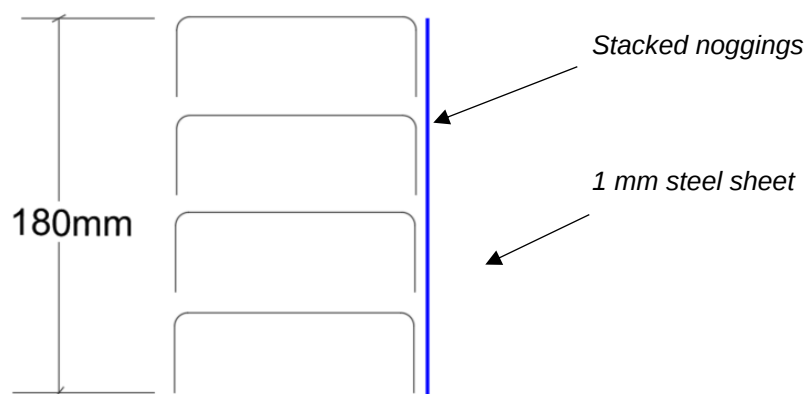


Fig. 4 Proposed grabrail reinforcement solution for steel framing - 4 stacked noggings with 1 mm sheet

Conclusion

This Advisory Note gives a solution for reinforcement of steel framed walls for grabrail support to meet the requirements of the ABCB Livable Housing Design Standard 2022. Other solutions may be developed providing they are designed in accordance with AS 1428.1.