

Using timber for temporary perimeter guardrails

Background

Framing timber has been used by the construction industry for many years to create temporary edge protection systems or guardrails to prevent falls from height.

However, these timber guardrails are not always made adequately — the standard of materials used, the spacing of supports and rails, and the method of fixing has varied widely — and in almost all cases, has been done without having an engineer verify the design.

What the laws say

A fall from height can cause serious injuries. Regulations 78 and 291 of the Work Health and Safety Regulations 2012 identify falls as a work health and safety issue, and regulation 78 requires the person conducting a business or undertaking (PCBU) to manage the risk of someone falling from:

- one level to another
- the perimeter of buildings or other structures
- through an opening (in a floor or roof)
- through a material or surface (for example, a brittle roof)
- over an edge (for example, of an excavation).

Purpose

This guidance note explains how to correctly use timber to create safe temporary guardrails.

If you are a building tradesperson, the code of practice 'Preventing Falls in Housing Construction' (in particular, section 4) contains adequate information for you to erect a temporary edge protection system using timber. This guidance note summarises that information. To see the code in full, go to the WorkSafe Tasmania website at www.worksafe.tas.gov.au and search for 'CP127'.

The code of practice 'Managing the Risks of Falls at Workplaces' (in particular, section 4.2) is also helpful. To see this code, go to the WorkSafe Tasmania website at www.worksafe.tas.gov.au and search for 'CP122'.

This guidance note does not apply to re-usable edge protection systems designed and manufactured in accordance with AS4994: Temporary edge protection—General requirements.

Using timber

Any building timber you use must be inspected by a person with relevant qualifications or experience to determine if it is a suitable standard for use in guardrails.

If you use pine, it must meet the minimum grade and be free of defects.

Where timber guardrails are not specifically designed in accordance with AS1657: Fixed platforms, walkways, stairways and ladders—Design, construction and installation, the member sizes set out in Figure 1 below may be used for guardrail and post sizes.

The methods for connecting timber posts to the support structure, or rails to posts, must have adequate strength for the purpose intended. See Figure 2 below for examples of two connection detail examples.

Maintenance

Any temporary edge protection system should be regularly inspected to ensure the strength of the component parts, and of the structure it is attached to, have not deteriorated. For example, make sure that rails have not rotted or split, block work has not cracked, or metal has not corroded.

You must get engineering advice when the load bearing strengths of a structure can't be determined due to its condition.

Engineering sign-off

If you use framing timber to construct a temporary edge protection system, it does not need to be verified by an engineer **as long as you meet or exceed** the specifications in this guidance note.

Specifications

Guardrails should:

- incorporate a top rail between 900 mm and 1100 mm above the working surface
- incorporate a midrail
- incorporate a toeboard (except where it may be impractical to do so) and alternative control measures, such as ‘no go’ zones, to ensure no one is at risk of being hit by falling objects from the work above
- be of robust construction and designed in accordance with the relevant Australian Standards (see the list at the end of this guidance note).

Wall framing — incorporating studs at 600 mm centres and one row of noggings — is an acceptable alternative to guardrails. Where the frame incorporates window or door openings, additional members must be fitted across these openings to provide the equivalent fall protection to the guardrails described above.

Wherever feasible, guardrails should be constructed so that when an outward force is applied, the posts are subjected to bending about their strong axis (see Figure 2 below).

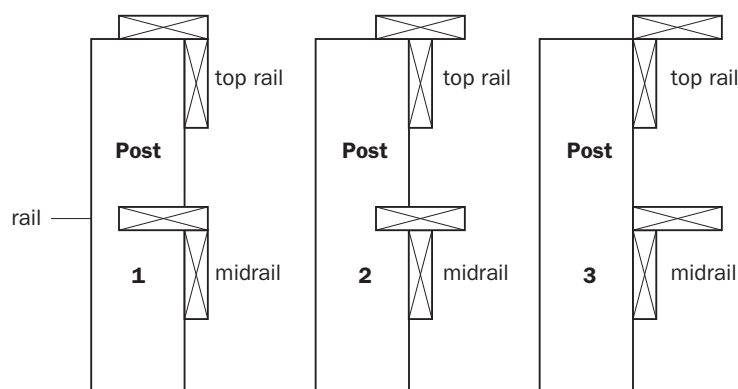
Other options

Other options for providing a safe temporary edge protection system are:

- engage a competent person to install a compliant scaffold system up to and around the perimeter of the edge; where the fall height exceeds four metres, the competent person must hold a high risk licence for scaffolding (as well as preventing a fall, the scaffold system can also provide an effective working deck); OR
- engage a competent person to install (according to AS4994 Part 2: Temporary edge protection–Roof edge protection–Installation and dismantling) a system that has been designed, manufactured and tested in accordance with AS4994 Part 1: Temporary edge protection–General requirements. Get written verification that both the system and the installation of the system complies with these Standards. These systems should also be configured, installed, used and dismantled according to the manufacturer’s/supplier’s instructions; OR
- engage an engineer to provide verification and design sign-off for installations other than those detailed in the above options.

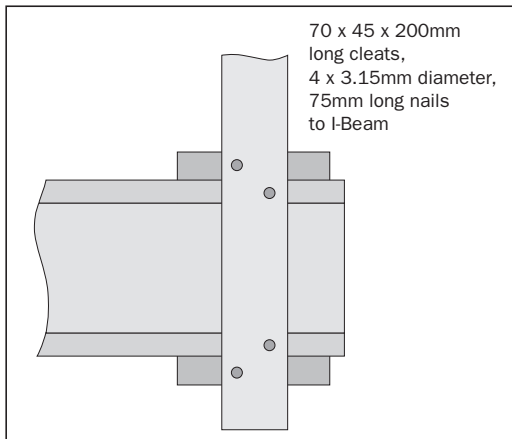
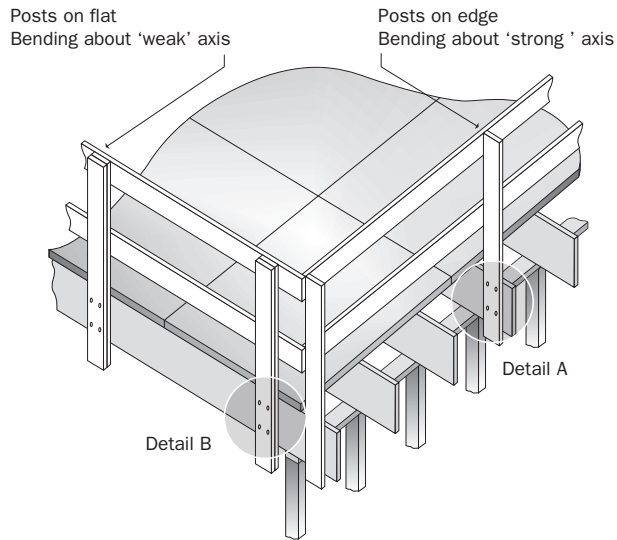
TIMBER GUARDRAILS		
Guardrail size depth X width (nominal sizes)	Maximum guardrail span (m)	
	F8 HW or MGP 12 seasoned pine	F7 pine
100 X 38	2.7	N/A
100 X 50	3.5	N/A
2 nos (90 x 35)**	N/A	3.5

****Timber members to be nailed together at maximum 300mm intervals in T or ‘L’ sections**

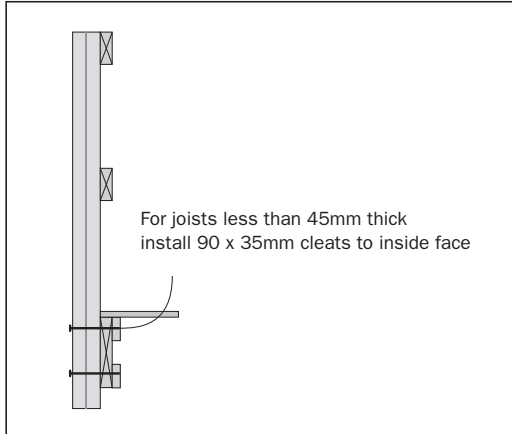
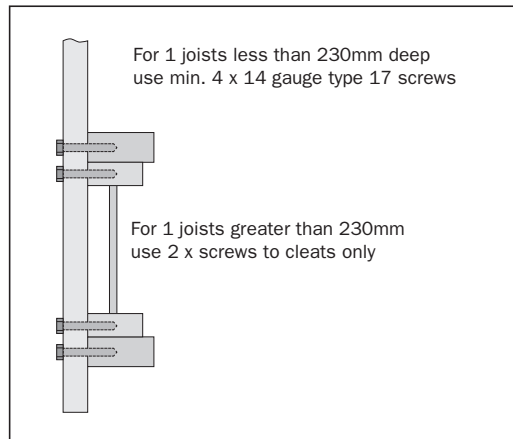


Examples of T or L Section

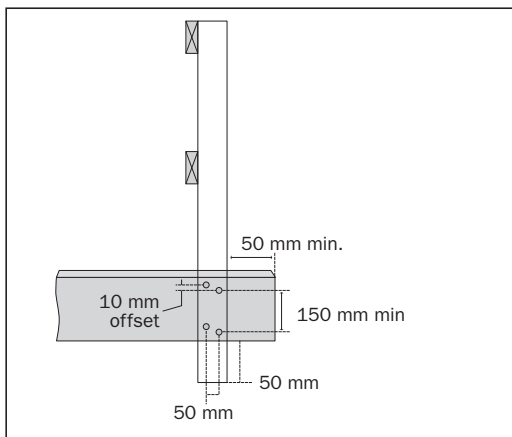
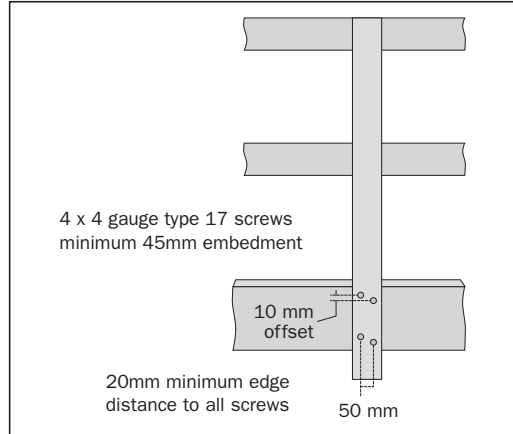
On option 1 and 2, the rail on the midrail would have to be cut between posts. The T or L sections must be applied to both top rail and midrail. The rail should be nailed to the top rail and midrail at maximum 300mm intervals (spaces).



Detail 'A' Bending about strong axis: I-Beam joists



Detail 'B' Bending about weak axis



Detail 'A' Bending about strong axis: solid floor joists

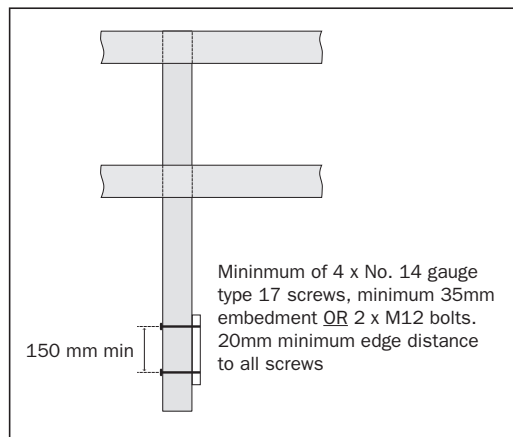


Figure 2: Timber guardrails – showing details of connections at A and B

Relevant Australian Standards

To purchase any of these standards, go to the SAI Global website at <http://infostore.saiglobal.com> and search for the code numbers listed here.

- AS 1657: Fixed platforms, walkways, stairways and ladders–Design, construction and installation, In particular, Section 2 on Structural design provides guidance on specifications when selecting materials, including timber.
- AS/NZS 4576: Guidelines for scaffolding. In particular, Section 8.8 on Edge Protection provides guidance on timber specifications when used as guardrails.
- AS/NZS 4994.1 Temporary edge protection–General requirements. While not expressly prohibiting the use of timber as guardrail, this standard deals with the design, manufacture and testing and certification of prefabricated steel components that form a re-useable edge protection system.
- AS 6001: Working platforms for housing construction. In particular, Section 3 on Loadings provides guidance on timber specifications when used in a guardrail arrangement.

Please note: The information provided in these standards or other reference documents cannot be applied without specific engineering advice, on a case-by-case basis.

For more information contact

Phone: 1300 366 322 (within Tasmania)
(03) 6166 4600 (outside Tasmania)

Fax: (03) 6233 8338

Email: wstinfo@justice.tas.gov.au

Mail: PO Box 56 Rosny Park 7018

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