

SA HB 39:2015
Installation code for metal roof
and wall cladding



Handbook

Installation code for metal roof and wall cladding

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PREFACE

This Handbook was prepared by a steering committee and peer reviewed by the Standards Australia Committee WS-014, Plumbing and Drainage, from contributions, sketches and the like received from installers, manufacturers of roofing materials and components, TAFE institutes and industry training organisations, to supersede, HB 39—1997.

The development of this Handbook was made possible by arrangement between the Victorian Building Authority, the Australian Steel Institute Ltd and Standards Australia Limited.

Acknowledgement is made to the Master Plumbers & Mechanical Services Association of Australia, the Association of Hydraulic Services Consultants Australia Ltd, along with the support of the steel roof installation industry.

The intention of this Handbook is to provide guidelines and basic standards of good practice for use by industry training providers, the Australian metal roofing installation industry and roofing contractors in any State or Territory.

AS/NZS 3500.3:2003, *Plumbing and drainage, Part 3: Stormwater drainage*, AS/NZS 3500.5:2012, *Plumbing and drainage, Part 5: Housing installations*, and HB 114:1998, *Guidelines for the design of eaves and box gutters*, also include important criteria for roof drainage, roof flashings and cappings, which should be read in conjunction with this Handbook.

Requests for interpretations or suggestions for improvement should be forwarded in the first instance to Standards Australia.

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STANDARDS AUSTRALIA

Handbook**Installation code for metal roof and wall cladding**

SECTION 1 GENERAL

1.1 SCOPE

This Handbook provides information and basic guidelines on the selection, performance and installation of metal roofing and wall cladding. Although the fixing details for roof drainage systems relate mainly to steel, acknowledgment is made of the other materials in common use such as profiled fibreglass reinforced polyester (FRP) and polycarbonate.

When utilised, the design and installation measures contained in this Handbook will provide a weatherproof exterior and ensure that all rainwater is directed to the stormwater drainage system.

The recommendations and best practice methods set out in this Handbook will ensure that—

- (a) the life of the roof sheeting, flashings and roof drainage systems including accessories, is optimised;
- (b) the installation of roof coverings and flashings are weathertight;
- (c) the installation of the roof drainage system is capable of discharging established rainfall intensities;
- (d) in the event of a blockage or partial blockage of the stormwater system or downpipes rainfall is discharged external to the building with no detrimental effect to the building or its contents;
- (e) the end effect of poor transportation, handling and storage is recognised and avoided;
- (f) safe work practices are observed, with full awareness of solar radiation effects on exposed skin and sun glare on eyesight;
- (g) the selection of materials reflects local environmental factors;
- (h) the correct types of fasteners and recommended fixing patterns are utilised;
- (i) the minimum and effective roof pitch recommendations for each profile are met;
- (j) the minimum and effective grade for roof drainage systems is met;
- (k) provision is made for expansion in roof coverings, gutters, flashings and downpipes;
- (l) roof noise is minimised; and
- (m) insulation is installed to ensure effective performance.

As the bulk of this Handbook refers to roofing, it is recommended that the user also source any appropriate additional information required for metal wall cladding installations from specific product manufacturers.

NOTE: The general design and sizing principles of roof drainage systems may also be utilised when installing drainage outlets, downpipes and overflow provision in above-ground external areas of buildings such as drains from balconies, patios and the like.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Handbook.

AS

- 1397 Continuous hot-dip metallic coated steel sheet and strip—Coatings of zinc and zinc alloyed with aluminium and magnesium
- 1562 Design and installation of sheet roof and wall cladding
- 1562.1 Part 1: Metal
- 1657 Fixed platforms, walkways, stairways and ladders—Design, construction and installation
- 3566 Self-drilling screws for the building and construction industries
- 3566.1 Part 1: General requirements and mechanical properties
- 3959 Construction of buildings in bushfire-prone areas
- 4055 Wind loads for housing
- 4256 Plastic roof and wall cladding materials
- 4256.2 Part 2: Unplasticized polyvinyl chloride (uPVC) building sheets
- 4256.5 Part 5: Polycarbonate

AS/NZS

- 1170 Structural design actions
- 1170.0 Part 0: General principles
- 1170.1 Part 1: Permanent, imposed and other actions
- 1170.2 Part 2: Wind actions
- 1562 Design and installation of sheet roof and wall cladding
- 1562.3 Part 3: Plastic
- 1665 Welding of aluminium structures
- 1892 Portable ladders
- 1892.5 Part 5: Selection, safe use and care
- 2179 Specifications for rainwater goods, accessories and fasteners
- 2179.1 Part 1: Metal shape or sheet rainwater goods, and metal accessories and fasteners
- 2312 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
- 2728 Prefinished/prepainted sheet metal products for interior/exterior building applications—Performance requirements
- 3500 Plumbing and drainage
- 3500.3 Part 3: Stormwater drainage
- 3500.5 Part 5: Housing installations
- 4256 Plastic roof and wall cladding materials
- 4256.3 Part 3: Glass fibre reinforced polyester (GRP)
- 4389 Safety mesh

ISO

- 9223 Corrosion of metals and alloys—Corrosivity of atmospheres—Classification, determination and estimation

ABCB

- NCC National Construction Code of Australia
Condensation in Buildings Handbook, 2014

| | |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| ASTM | |
| A240 | Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications |
| D257 | Standard Test Methods for DC Resistance or Conductance of Insulating Materials |
| IPCA | Insulated Panel Council of Australasia Code of Practice |
| Safe Work Australia | Preventing Falls in Housing Construction, Code of Practice, 2012 |
| Workplace Health and Safety Queensland | Managing the risk of falls at workplaces, Code of Practice (December 2011) |

1.3 TERMS AND DEFINITIONS

The following terms are used in this Handbook (see also Figure 1.3).

1.3.1 Accessories

Gutters for rainwater, ridge capping, valley gutters, flashings, downpipes, gutter brackets and the like.

1.3.2 Aluminium/zinc alloy-coated steel

Steel sheeting that is protected from corrosion by a hot dip coating of 50% to 60% aluminium, 1% to 2% silicon with the remainder zinc, and incorporating less than 1% of minor additions of control elements.

1.3.3 Aluminium/zinc/magnesium alloy-coated steel

Steel sheeting that is protected from corrosion by a hot dip coating of 47% to 57% aluminium, 1% to 3% magnesium, 1% to 2% silicon with the remainder zinc, and incorporating less than 1% of minor additions of control elements.

1.3.4 Barge

A finishing at the gable end of a roof, fixed parallel to the roof slope.

1.3.5 Concealed-fastened

A roof cover fixed by means of hidden, or secret, fixing clips or brackets.

1.3.6 Cross-sectional area of eaves gutter profile

The area beneath a line not less than 10 mm below the overflow provision of the gutter or with internal brackets less any allowance for the effects of the brackets, as determined by the manufacturer.

1.3.7 Downpipe

A pipe to carry roof water from gutters and roof catchments to drains or storage tanks.

1.3.8 Eaves gutter (spouting)

Internal (concealed) or external roof gutter attached to an eaves overhang.

1.3.9 Electrolytic (galvanic) corrosion

A type of corrosion that occurs when two dissimilar metals are in contact in a moist environment.

NOTE: Corrosion of the more reactive metal is accelerated by the presence of the less reactive metal.

1.3.10 Expansion joint

A joint in a long run of gutter, roof coverings or flashing designed to allow for thermal expansion and contraction.

1.3.11 Fall (slope)

The slope of the roof or gutter, usually expressed in degrees, or as a ratio of vertical height to horizontal distance (e.g. 1 in 20).

1.3.12 Fixings

Screws, nails, rivets or clouts used to fasten the roof sheeting or accessories to the building structure.

1.3.13 Flashing

A rigid or flexible material, usually metal, fixed over, against or built into an abutment to form a weathertight joint.

NOTE: When used to cover an inclined intersection against an abutment, the flashing may be described either as 'raking' when the top edge is secured into a chase cut parallel to the slope of the roof, or 'stepped' when the top edge is secured into the horizontal joints of a brick or masonry abutment and stepped up the slope from course to course.

1.3.14 Flashing, apron

An overflashing used to obtain a weathertight joint, usually where a roof abuts a vertical wall or penetration.

1.3.15 Flashing, counter (or over)

A flashing dressed down, as a cover only, over a separate upstand.

1.3.16 Flashing, hanging

Side, front or back cover piece used to prevent entry of water between abutting surfaces and other gutters, flashings and soakers.

1.3.17 Flashing, pressure

A flashing, fixed and sealed to a smooth finished wall, that covers the upstand to an apron or soaker flashing; *also* referred to as a 'K' flashing.

1.3.18 Flashing, soaker

A side or end flashing extended under roof coverings (which have the ribs closed) upstream of a penetration or at an abutment overflashed with a hanging flashing, or pressure flashing against the upstand.

1.3.19 Flashing, transverse

A flashing fixed across the ends of roof coverings at the upper end of the sheets such as at a ridge.

1.3.20 Freeboard

The vertical distance between a design maximum water level and the top of gutter to prevent wind driven spillages.

1.3.21 Galvanised steel

Steel sheeting protected against corrosion by a zinc coating applied by the continuous hot-dip process.

1.3.22 High capacity overflow

An overflow device fitted to a box gutter sump to relieve excess flow during high rainfall events.

1.3.23 Insulated panel

An insulated laminated roofing panel that is manufactured from different materials permanently bonded together so that they act as a single structural element.

1.3.24 Mansard

A roof built at two pitches, the steeper pitch commencing at the eaves and the flatter pitch finishing at the ridge.

NOTE: Sometimes used with reference to a steeply pitched roof finishing at the edge of a flat roof.

1.3.25 Monel metals

An alloy of nickel and copper and other metals (such as iron and/or manganese and/or aluminium).

1.3.26 Oil-canning

Variation from flatness of sheet metal, creating undulations along the surface.

NOTES:

- 1 The result is poor appearance and potential ponding.
- 2 Oil-canning is usually controlled by forming stiffening ribs along or across the pans of a profile.

1.3.27 Pan (trays)

The flat portion between the ribs in a pan-type preformed sheet.

1.3.28 Penetration

A projection through the roof (e.g. vent pipe, roof light or duct).

1.3.29 Pierce-fastened

A roof cover drilled and fixed by means of a screw or nail.

1.3.30 Ponding

Undrained water on a roof.

1.3.31 Pop

Gutter outlet point; also referred to as downpipe outlet and spout.

1.3.32 Preformed sheet

A roofing sheet with longitudinal ribs, which increase its resistance to vertical loads.

1.3.33 Rainhead

A collector connected to a downpipe at the end of a gutter, external to the building that permits a free flow from the end of the gutter.

1.3.34 R-value

The thermal resistance ($\text{m}^2\cdot\text{K}/\text{W}$) of a component calculated by dividing its thickness by its thermal conductivity.

1.3.35 Rib

A longitudinal upstand in a preformed sheet produced by bending, folding or crimping.

1.3.36 Ridge capping

Formed metal designed to weatherproof the junction at the apex of opposing roof slopes.