

Australian/New Zealand Standard™

Gypsum linings—Application and finishing



AS/NZS 2589:2017

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee BD-011, Interior Board Lining. It was approved on behalf of the Council of Standards Australia on 20 February 2017 and by the New Zealand Standards Approval Board on 7 March 2017. This Standard was published on 13 April 2017.

The following are represented on Committee BD-011:

Association of Wall and Ceiling Industries of Australia
Association of Wall and Ceiling Industries of New Zealand
Australian Chamber of Commerce and Industry
Australian Paint Manufacturers' Federation
Gypsum Board Manufacturers of Australasia
Housing Industry Association
Master Builders
South Australian Housing Trust

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.saiglobal.com or Standards New Zealand web site at www.standards.govt.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 2589:2016.

Australian/New Zealand Standard™

Gypsum linings—Application and finishing

Originated as AS 2589—1983 and in part as AS CA20—1950.
Previous edition AS/NZS 2589:2007.
Second edition 2017.
Reissued incorporating Amendment No. 1 (November 2018).

COPYRIGHT

© Standards Australia Limited

© The Crown in right of New Zealand, administered by the New Zealand Standards Executive

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6140.

ISBN 978 1 76035 723 8

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD-011, Interior Board Lining, to supersede AS/NZS 2589:2007, *Gypsum linings—Application and finishing*.

This Standard incorporates Amendment No. 1 (November 2018). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide manufacturers, designers and users of gypsum linings with requirements for the application and finishing of such linings in residential and commercial construction applications. This Standard provides a reference for the building industry and specifiers, and a basic Standard for adoption in contracts.

This edition incorporates the following major changes to the previous editions:

- (a) Inclusion of surface tolerances.
- (b) Cross-reference and alignment to AS/NZS 2311.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	5
1.2 APPLICATION	5
1.3 NORMATIVE REFERENCES	5
1.4 DEFINITIONS.....	7
1.5 ALTERNATIVE SYSTEMS AND MATERIALS.....	10
SECTION 2 MATERIALS	
2.1 GENERAL.....	11
2.2 GYPSUM PLASTERBOARD LINING	11
2.3 FIBRE-REINFORCED GYPSUM LINING.....	11
2.4 GYPSUM CORNICE.....	11
2.5 FRAMING SUBSTRATES	11
2.6 TIMBER FRAMING	11
2.7 METAL FRAMING	12
2.8 MASONRY	13
2.9 FASTENERS	13
2.10 CORNER BEAD AND EDGE TRIM	14
2.11 JOINT REINFORCING TAPES AND CEMENTS FOR FINISHING.....	15
2.12 MASTIC ADHESIVE.....	15
2.13 DECORATIVE MATERIALS.....	15
SECTION 3 DESIGN REQUIREMENTS	
3.1 QUALITY OF GYPSUM LINING APPLICATION AND FINISHING	16
3.2 STRUCTURAL ACTIONS	18
3.3 STRUCTURAL MOVEMENT	19
3.4 CONTROL JOINTS	19
3.5 SUBSTRATES	21
3.6 VENTILATION AND MOISTURE MANAGEMENT.....	24
3.7 LIGHTING	25
3.8 ORIENTATION	25
3.9 PAINTING OF GYPSUM LININGS	25
3.10 DEVICES GENERATING HEAT	25
3.11 INSULATING SYSTEMS.....	25
3.12 EXTERNAL APPLICATIONS.....	25
SECTION 4 INSTALLATION	
4.1 SITE CONSIDERATIONS	26
4.2 SUBSTRATES	26
4.3 LAYOUT.....	28
4.4 GYPSUM PLASTERBOARD	31
4.5 FIBRE-REINFORCED GYPSUM LININGS	43
4.6 FIXING OF CORNICES	46
4.7 ASSESSMENT OF THE SURFACE CONDITION AT HANDOVER.....	46
4.8 INSULATING SYSTEMS.....	51

APPENDICES

A	MEASURING THE MOISTURE CONTENT OF TIMBER FRAMING.....	52
B	DECORATION.....	55
C	VISIBLE SAG IN CEILINGS	60
D	DESIGN CONSIDERATIONS	64
E	POSSIBLE CAUSE OF UNEVEN LININGS.....	67
F	PARTIAL SHEET REPLACEMENT	68

BIBLIOGRAPHY..... 69

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Gypsum linings—Application and finishing

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out the requirements for the application and finishing of gypsum linings and related design considerations.

This Standard does not cover the following:

A1

- (a) High density gypsum plasterboard linings greater than 800 kg/m³.
- (b) Fire-resisting systems.
- (c) Wet area gypsum lining systems.
- (d) Sound insulating systems.
- (e) Bracing systems.

The wall and ceiling fastening systems are limited to wind category N4, as specified in AS 4055 or NZS 3604.

NOTE: For specialty plasterboards with a density greater than 800 kg/m³ refer to manufacturer's specifications.

1.2 APPLICATION

This Standard provides a choice of different levels of finish, which allows for flexibility of application. Unless otherwise specified, compliance with this Standard is achieved by a Level 4 finish for all gypsum linings except for those areas which are non-visible and generally non-habitable (i.e. non-walk-in cupboards, concealed storage areas and non-livable attics) where a Level 3 finish is acceptable.

This Standard is suitable for use with gypsum plasterboard in accordance with AS/NZS 2588, fibre-reinforced gypsum linings in accordance with Clause 2.3 and gypsum cornices in accordance with Clause 2.4.

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for guidance and informative purposes are listed in the Bibliography.

AS

- | | |
|--------|---|
| 1397 | Continuous hot-dip metallic coated steel sheet and strip—Coatings of zinc and zinc alloyed with aluminium and magnesium |
| 1684 | Residential timber-framed construction |
| 1684.1 | Part 1: Design criteria |
| 1684.2 | Part 2: Non-cyclonic areas |
| 1684.3 | Part 3: Cyclonic areas |
| 1684.4 | Part 4: Simplified—Non-cyclonic areas |

AS	
1720	Timber structures
1720.1	Part 1: Design methods
1720.2	Part 2: Timber properties
2331	Methods of test for metallic and related coatings
2331.3.1	Method 3.1: Neutral salt spray test (NSS test)
2334	Steel nails—Metric series
2753	Adhesives—Mastic—For bonding gypsum plaster linings to wood and metal framing members
3566	Self-drilling screws for the building and construction industries
3623	Domestic metal framing
3700	Masonry structures
3730	Guide to the properties of paints for buildings (series)
4055	Wind loads for housing
4440	Installation of nailplated timber roof trusses
AS/NZS	
1080	Timber—Methods of test
1080.1	Method 1: Moisture content
1170	Structural design actions
1170.0	Part 0: General principles
1170.1	Part 1: Permanent, imposed and other actions
2311	Guide to the painting of buildings
2588	Gypsum plasterboard
2785	Suspended ceilings—Design and installation
4600	Cold-formed steel structures
NZS	
3602	Timber and wood-based products for use in building
3603	Timber Structures Standard
3604	Timber framed buildings
4229	Concrete masonry buildings not requiring specific engineering design
ASTM	
C475	Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
NCC	National Construction Code
NASH Standard	
	Residential and low-rise steel framing
	Part 1: Design criteria
NZBC	New Zealand Building Code

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Administrative definitions

1.4.1.1 *Approved*

Approved by the building authority.

1.4.1.2 *Building authority*

A body having statutory control over the design and erection of buildings or structures in the area in which the building or structure is to be erected.

1.4.2 Technical definitions

1.4.2.1 *Adhesive*

Mastic adhesive, as specified in AS 2753, for fixing gypsum lining to framing members.

1.4.2.2 *Back blocking*

A system where longitudinal or butt joints are reinforced with rectangular pieces of gypsum lining laminated to the back surfaces of lining across a joint.

1.4.2.3 *Butt joint*

Any joint other than that between two recessed edges.

1.4.2.4 *Concealed joints*

A joint between gypsum lining sheets which is reinforced with tape and concealed with jointing cement/jointing compound.

1.4.2.5 *Control joint*

A physical separation in wall and ceiling linings to relieve stress build-up due to structural movement or changes in temperature and humidity, or both.

1.4.2.6 *Cornice cement*

Adhesive that is commonly used for adhering cornices to wall and ceiling junction.

NOTE: Also known as cornice adhesive, cornice bond or cove adhesive.

1.4.2.7 *Critical lighting*

Natural or artificial light projected across a surface at a low incidence angle.

1.4.2.8 *Edge*

The machine-wrapped edge of a gypsum plasterboard sheet, or the formed or cut sides of the fibre-reinforced plaster product.

1.4.2.9 *End*

A factory-cut or field-cut of a gypsum plasterboard sheet that exposes the gypsum core.

1.4.2.10 *Fasteners*

Nails, screws and similar mechanical fasteners, for fixing gypsum linings.

NOTE: Unless otherwise specifically described in this Standard as 'temporary', fasteners are to be understood as permanent.

1.4.2.11 *Finishing*

The operations necessary to prepare the surface of linings for final decoration by painting or application of other finishes, including taping of joints, covering of fasteners and sanding of treated surfaces.

NOTE: Also known as stopping, flushing or setting.

1.4.2.12 Fire-resisting systems

For Australia—as defined in the NCC.

For New Zealand—as defined in the NZBC.

1.4.2.13 Framing member

Those portions of the framing, trimming and furring which serve as a base to support the linings.

1.4.2.14 Furring system

Metal framing or timber batten(s) used to support wall or ceiling linings.

1.4.2.15 Gypsum plasterboard

A machine-made paper-faced lining board with a gypsum core.

1.4.2.16 Horizontal application of wall lining

Gypsum lining installed where the edges are at right angles to vertical framing members to which the board is to be fixed (see Figure 1.4.2.16).

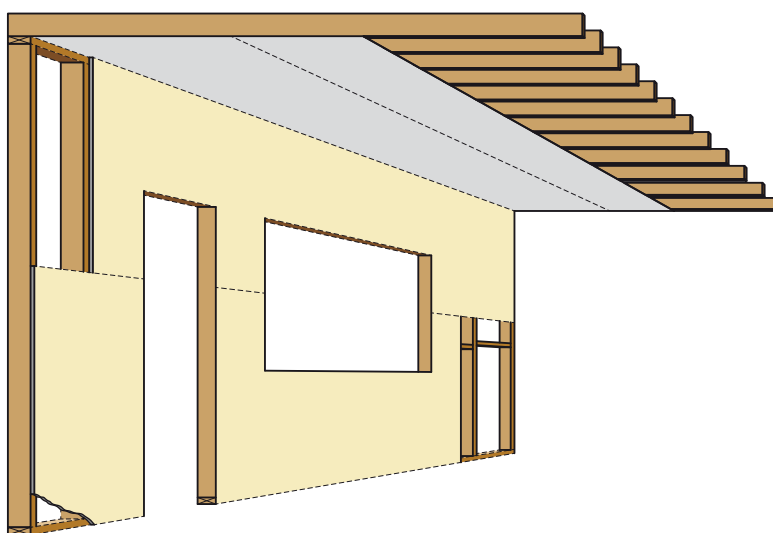


FIGURE 1.4.2.16 HORIZONTAL APPLICATION OF WALL LINING

1.4.2.17 Jointing cement/jointing compound

Material used to conceal joints between gypsum lining sheets and fastener heads embedded in the face of gypsum linings.

1.4.2.18 Masonry

Assemblage of masonry units interconnected or bonded with mortar.

NOTE: Masonry units are building products that include, but are not limited to, concrete blocks, concrete panels, clay, concrete or calcium silicate bricks and autoclaved aerated concrete.

1.4.2.19 Masonry adhesive or cement

A gypsum-plaster-based adhesive designed for direct bonding of gypsum plasterboard to masonry surfaces.

1.4.2.20 Movement joint

A physical separation in the substrate to accommodate structural movements and movements due to changes in temperature and humidity.

1.4.2.21 *Non-critical lighting*

The light that strikes the surface and is diffused and not parallel to that surface.

1.4.2.22 *Plaster ready*

Substrate has been completed and is ready to receive internal linings.

NOTE: Refer to the AWCIANZ Trade Guidelines.

1.4.2.23 *Recessed edge*

An edge that is tapered on the face side of gypsum lining sheets to form a recess for jointing.

1.4.2.24 *Scrimming*

Reinforcement applied to the back of a joint between sheets or fibre-reinforced gypsum linings, or over the supporting framework, or both.

NOTE: The reinforcement consists of glass fibre or other suitable fibre reinforcing material thoroughly incorporated in and soaked with gauged plaster.

1.4.2.25 *Seasoned timber*

Timber, where the moisture content of 90% or greater portion of the parcel of timber at the time of production is less than 15%.

1.4.2.26 *Shall*

Indicates that a statement is mandatory.

1.4.2.27 *Should*

Indicates a recommendation.

1.4.2.28 *Skim coating*

A thin finish coat of an air-drying material, trowelled or spray applied to achieve a parity of texture and porosity over the entire surface of gypsum linings.

1.4.2.29 *Smoke separation*

Any building element able to prevent the passage of smoke between two spaces—

- (a) *for Australia*—as defined in the NCC; and
- (b) *for New Zealand*—as defined in the NZBC.

1.4.2.30 *Square set finish*

The wall to ceiling junction is set/stopped in the same manner as an internal corner with a reinforcing tape or internal corner trim embedded in jointing compound.

NOTE: Also known as square stopping.

1.4.2.31 *Trimmer*

A member used to bridge between other framing members.

NOTE: Also known as nog, noggin, nogging, blocking and dwang.

1.4.2.32 *Unconcealed joints*

A joint between gypsum lining sheets which is left exposed in the finished work or which may be covered by strips or mouldings.

1.4.2.33 *Unseasoned timber*

Timber, where the moisture content of 90% or greater of the parcel of timber at the time of production is greater than or equal to 15%.

1.4.2.34 *Vertical application of wall lining*

Gypsum lining installed where the edges are parallel to the framing members to which the board is to be fixed (see Figure 1.4.2.34).

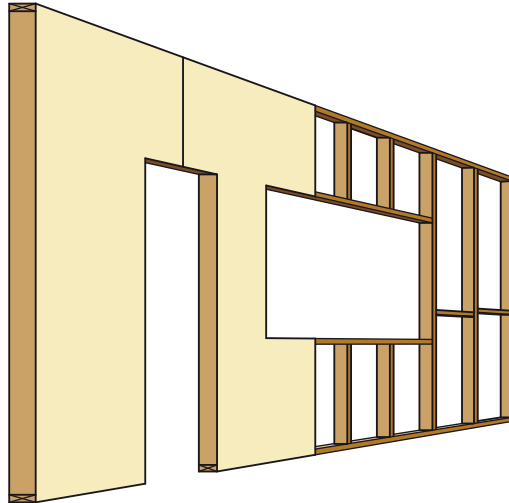


FIGURE 1.4.2.34 VERTICAL APPLICATION OF WALL LINING

1.4.2.35 *Wadding*

See *Scrimming*.

1.5 ALTERNATIVE SYSTEMS AND MATERIALS

Alternative systems, materials, methods of assembly and procedures that are not specified in this Standard may be used, provided it can be demonstrated that the result or alternative system satisfies the requirements of this Standard. Service durability and strength shall be considered in any assessment of new materials.

SECTION 2 MATERIALS

2.1 GENERAL

This Section sets out requirements for the materials used in common gypsum wall and ceiling lining systems. The materials shall be fit for the intended use.

2.2 GYPSUM PLASTERBOARD LINING

Gypsum plasterboard linings shall be in accordance with AS/NZS 2588.

2.3 FIBRE-REINFORCED GYPSUM LINING

A sheet lining material composed of gypsum plaster and fibre reinforcement forming a stiff body, one surface of which is smooth and suitable for decoration.

NOTE: For manufacturing guidance, refer to the 'Fibre-reinforced gypsum products Manufacturing Code of Practice for Australia & New Zealand', New Zealand Fibrous Plaster Association,

<http://www.fibrousplaster.org/sites/default/files/pdf/%20Manufacturing%20Code%20Of%20Practice.pdf>, available at www.fibrousplaster.org.

2.4 GYPSUM CORNICE

Paper-faced or fibre-reinforced non-load-bearing ornamental gypsum plaster shapes for architectural embellishment of wall and ceiling junctions.

2.5 FRAMING SUBSTRATES

Gypsum linings require a stable substrate at the time of installation in order to minimize in-service surface defects.

Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials detrimental to the adhesive bond. Where treated timber framing substrates are required, which may adversely affect bond performance, such performance shall be verified by testing in accordance with AS 2753.

2.6 TIMBER FRAMING

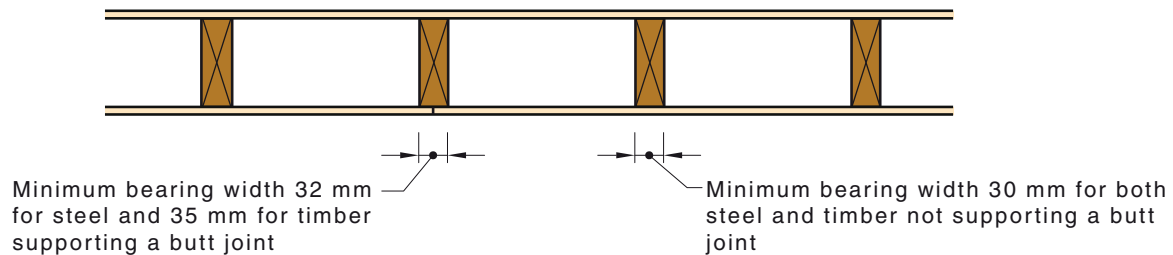
2.6.1 General

Timber framing to which gypsum lining is fixed shall be in accordance with the following:

- (a) *For Australia*—AS 1684.1, AS 1684.2, AS 1684.3, AS 1684.4, AS 1720.1, AS 1720.2 or the NCC.
- (b) *For New Zealand*—NZS 3602, NZS 3603 or NZS 3604.

The substrate members that are to support a joint (parallel to the member such as required for butt joints) shall have a minimum nominal fixing face width of 35 mm. This is to facilitate the fixing of board linings. All other substrate members shall have a nominal fixing face width of not less than 30 mm (see Figure 2.6.1).

A1



NOTES:

- 1 The difference between the minimum bearing widths for steel and timber relates to the ability to fix close to the edge of the substrate.
- 2 Bearing width is the overall width of the framing members including edge rounding.

FIGURE 2.6.1 MINIMUM BEARING WIDTH FOR SUBSTRATES

2.6.2 Moisture content for Australia

The maximum moisture content for seasoned timber framing at the time of installing gypsum linings shall be less than 15%, in accordance with Appendix E of AS 1684.2. The moisture content of timber framing shall be measured in accordance with Appendix A.

NOTE: Moisture content within the timber frame may be affected by factors, such as environmental conditions refer to AS 1684.2 and AS 1684.3).

2.6.3 Moisture content for New Zealand

Consideration shall be made of the effects of moisture content on the stability of timber substrate at the time of lining.

The maximum moisture content for timber framing at the time of installing gypsum linings shall be 18%. The moisture content of timber framing shall be measured in accordance with Appendix A.

NOTES:

- 1 The permissible moisture content is specified on the basis that 90% of pieces should be below the specified limit with the remainder within a further $\pm 2\%$ moisture content.
- 2 The requirement of the Clause reflects the requirements for an intermittently heated building such as from open fires or electrical heaters in residential dwellings. NZS 3602 provides recommendations and requirements for situations such as where air-conditioned or centrally heated installations are planned, where a lower timber framing moisture content range at the time of installation of linings should be contemplated (8% to 14%). The objective should always be to install linings to timber framing with a moisture content as close as possible to the final equilibrium level of the completed and occupied building.

2.7 METAL FRAMING

2.7.1 General

Metal framing to which gypsum lining is fixed shall be in accordance with AS 1397, AS 3623, AS/NZS 4600 or NASH Standard, as applicable.

2.7.2 Fixing surfaces

The requirements for fixing surfaces shall be as follows:

- (a) The substrate members that support a joint (parallel to the member such as required for butt joints) shall have a minimum fixing face width of 32 mm for screw fixing. All other substrate members shall be not less than 30 mm (see Figure 2.6.1).

NOTE: This is to facilitate the fixing of board linings.

- (b) The maximum deviation in the plane of the fixing face between the edge and the area on the face where the fastener penetrates shall be no more than 0.75 mm (see Figure 2.7.2).

NOTE: This is to prevent bending of the gypsum linings at the edge of the bearing face and unnecessary force imposed on fastener heads.

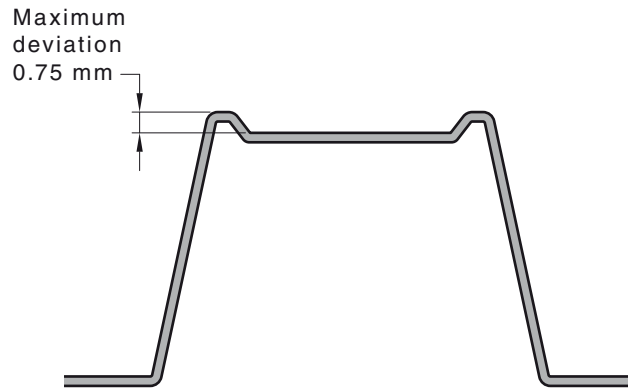


FIGURE 2.7.2 MAXIMUM DEVIATION IN PLANE OF FIXING FACE

2.8 MASONRY

Where masonry is used as the substrate, it shall be in accordance with the following:

- (a) *For Australia*—AS 3700.
- (b) *For New Zealand*—NZS 4229.

2.9 FASTENERS

2.9.1 Screws

Screws shall be in accordance with AS 3566.1 and AS 3566.2 and be a minimum Corrosion Resistance Class 1 and compatible with the substrate. The length and size shall be as given in Table 2.9.1. For gypsum plasterboard, the heads of fasteners shall be shaped so that they can be driven slightly below the surface of the gypsum plasterboard without punching through the face linerboard.

NOTES:

- 1 Additional corrosion protection may be required when fixing to some treated timbers or where harsh environmental conditions prevail.
- 2 Commonly used screw fastener designations are the following:
 - (a) W for wood.
 - (b) S for steel [for up to and including 0.75 mm base metal thickness (BMT)].
 - (c) D for drill point (for steel greater than 0.75 mm BMT).
 - (d) L for laminating.
- 3 For multi-layer systems refer to the manufacturer's published installation details for information on fixings.

TABLE 2.9.1
MINIMUM SCREW LENGTHS AND SIZE FOR GYPSUM LINING

Gypsum lining thickness		Substrate materials					
		Hardwood		Softwood		Steel	
		Screw length mm	Screw gauge No.	Screw length mm	Screw gauge No.	Screw length mm	Screw gauge No.
10	Walls	25 W	6	25 W	6	25 S or D	6
	Ceilings	30 W	6	30 W	6	25 S or D	6
13	Walls	25 W	6	30 W	6	25 S or D	6
	Ceilings	30 W	6	30 W	6	25 S or D	6
16	Walls	30 W	6	45 W	6	30 S or D	6
	Ceilings	30 W	6	45 W	6	30 S or D	6

NOTES:

- 1 Needle point screws shall be used for steel thicknesses less than or equal to 0.75 mm BMT.
- 2 Drill point screws shall be used for steel thicknesses greater than 0.75 mm BMT.

2.9.2 Nails

Nails shall have a corrosion-resistant finish and be appropriate for the intended use. Nails shall be compatible with the substrate. Nail lengths shall be as given in Table 2.9.2. When tested in accordance with AS 2331.3.1, the corrosion-resistant finish shall protect the base material for not less than 72 h.

NOTE: Additional corrosion protection may be required when fixing to some treated timbers or where harsh environmental conditions prevail.

The heads of fasteners shall be shaped so that they can be driven slightly below the surface of the gypsum lining without punching through the face linerboard. Any nails used shall be in accordance with AS 2334.

TABLE 2.9.2
MINIMUM SIZE NAILS FOR GYPSUM LINING

Gypsum plasterboard thickness mm	Substrate material	
	Hardwood	Softwood
10	2.8 × 30 mm galvanized nail or 2.8 × 25 mm ring shanked nail	2.8 × 40 mm galvanized nail or 2.8 × 30 mm ring shanked nail
13	2.8 × 30 mm galvanized nail or 2.8 × 25 mm ring shanked nail	2.8 × 40 mm galvanized nail or 2.8 × 30 mm ring shanked nail
16	2.8 × 40 mm galvanized nail	2.8 × 50 mm galvanized nail
19	2.8 × 50 mm galvanized nail	2.8 × 50 mm galvanized nail

2.10 CORNER BEAD AND EDGE TRIM

Corner beads shall be lifted 6–10 mm from the floor.

Corner bead and edge trim shall be made from galvanized steel or other suitable material. When tested in accordance with AS 2331.3.1, any corrosion-resistant finish shall protect the base material for not less than 72 h. Flanges shall be free from dirt or other materials that may affect the bond of the joint treatment.

NOTE: Additional corrosion protection may be required when fixing to some treated timbers or where harsh environmental conditions prevail.

2.11 JOINT REINFORCING TAPES AND CEMENTS FOR FINISHING

Joint reinforcing tapes and cements shall be in accordance with ASTM C475 (excluding Clause 9.2). Where woven or self-adhesive woven fibreglass joint-reinforcing tapes are used, the joint shall be back-blocked.

2.12 MASTIC ADHESIVE

Mastic adhesive shall be in accordance with AS 2753. It shall be labelled as suitable for bonding gypsum linings to the framing members to be used.

Care shall be taken in selecting adhesives for use on treated timber due to variable adhesion performance.

NOTE: For installation, refer to adhesive and gypsum lining manufacturer's specifications.

2.13 DECORATIVE MATERIALS

Consideration shall be made of the quality of paint decoration to be applied to gypsum linings.

NOTES:

- 1 Paint should be as described in AS 3730 (series).
- 2 Sealers should be as described in AS 3730.22.
- 3 To minimize the risk of surface staining, particular care should be taken in the selection of decorative materials where solvent-based adhesives are used for installation of gypsum linings.

SECTION 3 DESIGN REQUIREMENTS

3.1 QUALITY OF GYPSUM LINING APPLICATION AND FINISHING

3.1.1 General

The needs of the client shall be determined at the design stage. Gypsum lining will require different specifications depending on where they are installed and the level of finish required. Level 4, as specified in Clause 3.1.4, shall be the default level for gypsum lining systems unless specified otherwise.

NOTES:

- 1 At the time of design, factors that will affect visual appearance are as follows:
 - (a) Architectural designs that encompass large unbroken ceiling areas, large windows and a minimalist and uncluttered look.
 - (b) The direction and location of natural and artificial lighting, as it may have detrimental effect on the appearance of the gypsum lining.
 - (c) The construction schedule and site conditions.
 - (d) The quality of workmanship at all stages of installation, jointing and decoration of linings.
 - (e) The framing quality.
 - (f) The type of decoration to be applied.
- 2 Prior to the commencement of interior lining work, it is good practice to establish a sample or reference area of the finished decorated wall or ceiling, or both, which may be used to subjectively judge acceptability of the quality of finish under prescribed conditions of inspection.
- 3 Customer satisfaction with the quality of the final decorated finish will be achieved by setting expectations followed by the appropriate specification of materials, work standards and choice of skilled trade people. Specification of key aspects of functionality and the performance of the walls and ceilings of a building should reflect the needs and expectations of the customer.

3.1.2 Gypsum lining finishes

Gypsum linings will require different specifications depending on where they are installed and the level of gypsum lining finish required. These levels of gypsum lining finish [see Items (a), (b) and (c)] only apply to gypsum-lined walls and ceilings, prior to decoration.

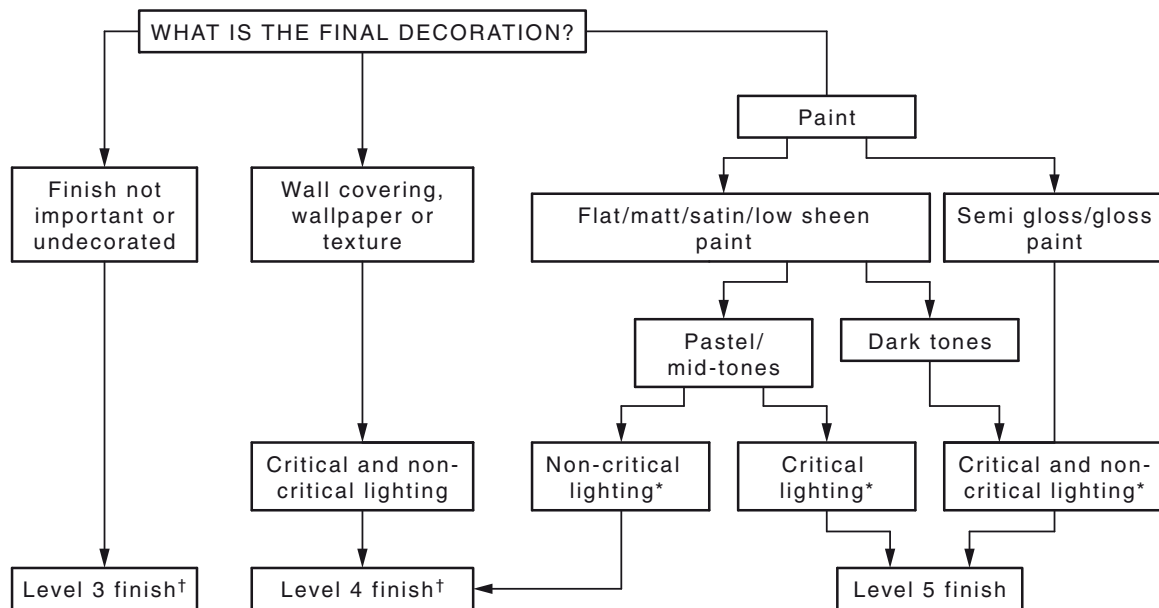
The specification levels of gypsum lining finishes shall be as follows:

- (a) Level 3 (see Clause 3.1.3).
- (b) Level 4 (see Clause 3.1.4).
- (c) Level 5 (see Clause 3.1.5).

The choice of a level of finish, depending on the final decoration of the room or lining, shall be as shown in Figure 3.1.2.

NOTE: For further details on the factors affecting levels of finish, reference should be made to the following:

- (a) Plasterboard expectations (refer to Association of Wall and Ceiling Industries of Australia and New Zealand, 'AWCI Trade Guidelines and Information Booklet').
- (b) Illumination and decoration of flat surfaces (refer to CSIRO, Division of Building Research, Report TR 90/1).
- (c) Finishing and decoration of plasterboard (see Appendix B).
- (d) Refer to gypsum lining manufacturer's publications.



* Critical lighting: natural or artificial light projected across a surface at a low incidence angle.

Non-critical lighting: when the light striking the surface is diffuse or at right angles, or both.

† May not be suitable for subsequent decoration to high levels of quality in the future.

See Level 4 or Level 5 for upgrading requirements.

FIGURE 3.1.2 SELECTION OF LEVEL OF FINISH FOR LINING

3.1.3 Level 3

Level 3 shall be used in areas that do not require decoration (for example, above ceiling level or inside service shafts and the like).

All joints and interior angles shall have tape embedded in jointing cement/jointing compound and one separate coat of jointing cement/jointing compound applied over all joints and fastener heads. All jointing cement/jointing compound shall be finished smooth.

NOTE: Generally, this is assisted by scraping off nibs and ridges, and the like, with the edge of a trowel.

3.1.4 Level 4

Level 4 shall be the default level for gypsum lining.

Flat, matt or low sheen paints shall be used for this Level 4.

All joints and interior angles shall have tape embedded in jointing cement/jointing compound and a minimum of two separate coats of jointing cement/jointing compound applied over all joints, angles, fastener heads and accessories. All jointing cement/jointing compound shall be finished evenly and be free of tool marks and ridges in preparation for decoration.

NOTES:

- 1 In critical lighting conditions, surface imperfections may still be apparent in a Level 4 surface finish.
- 2 Where gloss, semi-gloss and deep tone paints are used, surface imperfections will be more evident.

3.1.5 Level 5

Level 5 shall be used where gloss or semi-gloss paints are to be used or where critical lighting conditions occur on flat, matt or low sheen paints.

A Level 5 finish is characterized by a parity of texture and porosity. The surface texture shall be random in fashion and monolithic, concealing joints and fixing points.

All joints and interior angles shall have tape embedded into jointing cement/jointing compound and a minimum of two separate coats of jointing cement/jointing compound applied over all joints, angles, fastener heads and accessories. All jointing cements/jointing compounds shall be finished free of tool marks and ridges.

A paint or plaster material shall then be sprayed, rolled or trowelled over the defined area.

NOTES:

- 1 See Clause 3.1.1 for achieving agreed quality of finish.
- 2 A Level 5 finish does not mean the surface is without texture variation.
- 3 When installed and jointed in accordance with Clause 4.5, fibre-reinforced gypsum linings will inherently be in accordance with the requirements of Level 5 without the need for further surface treatment to achieve parity of texture and porosity.
- 4 A Level 5 finish is difficult to achieve and always requires the cooperation of the framer, plasterer and painter in establishing suitable work practices that deliver the agreed painted finish for the given project.
- 5 Some minor surface imperfections may still be visible in a Level 5 finish; however, these will be minimized under the additional measures applied under Level 5.
- 6 Level 5 expectations can be compromised by dark colours, glancing light and gloss finishes.
- 7 The surface of the defined area may require sanding to be suitable for decoration.

3.2 STRUCTURAL ACTIONS

3.2.1 Serviceability limit state

Consideration shall be made of the effects on installed gypsum linings resulting from self-weight, humidity, imposed actions and internal and external environmental conditions.

NOTES:

- 1 Sag in ceiling linings can occur over time as a result of self-weight, humidity, imposed actions and internal and external environmental conditions. Typical imposed actions include light fittings, fans, insulation and other services that may be fully or partially supported by the gypsum linings.
- 2 Advice on strength capacity for specific plasterboard types, thicknesses and spans is available from gypsum plasterboard manufacturers. If the actions are in excess of that recommended by manufacturers, it will be necessary to include some means of supporting the actions other than directly on the gypsum plasterboard, or to establish that the actions can be adequately supported.
- 3 Guidance on methods that can be used to assess performance is provided in Appendix C.

3.2.2 Ultimate limit state

For Australia, the wall or ceiling fastening system specified in this Standard shall be designed to resist a differential pressure of 0.67 kPa. This pressure is derived from AS/NZS 1170.0 and includes Regions A and B up to and including wind Category N4 as specified in AS 4055. Where differential pressure due to wind on the wall or ceiling linings exceeds 0.67 kPa, fastening methods shall be by specific design.

For New Zealand, the fastening systems outlined in this Standard may not provide the bracing unit rating required within the provisions of NZS 3604. To conform with the requirements of NZS 3604, specified details of bracing systems shall be in accordance with the manufacturer's specifications.

Structural performance of systems incorporating gypsum linings shall not be assumed unless verified by test or rational design methods.

3.3 STRUCTURAL MOVEMENT

Partitions and gypsum linings shall be relieved from the building elements, particularly at columns, ceilings and intersections with dissimilar materials, where differential movement is likely to occur.

Provided that ceilings are relieved around the perimeter from walls to allow in-plane movement, Level 4 ceilings supported by a ceiling suspension system in accordance with AS/NZS 2785 shall not require back blocking.

NOTES:

- 1 Most cracking of gypsum lining in buildings are caused by excessive lining deflection, physical change in linings and substrate materials due to temperature and humidity changes, structural and non-structural settlement, actions such as those imposed by an earthquake, or a combination of these factors.
- 2 Permanent and imposed actions in floor slabs cause deflections in partitions (see Paragraph D5 of Appendix D for further information).
- 3 Gypsum linings should not be assumed as a structural element unless verified by test or rational design methods.
- 4 Designers should take necessary measures to limit the impact of movement on gypsum linings at the design stage.

3.4 CONTROL JOINTS

Control joints and their positioning shall be determined at design stage and included on relevant specifications and diagrams including accurate details for installation.

Control joints shall be provided at not more than 12 m intervals in either direction for internal walls and ceilings, and at not more than 6 m intervals in either direction for external ceilings. Where a control joint is required in a wall or ceiling it shall be continuous through battens and mouldings, such as cornices, in order to maintain continuity. Additionally, control joints shall coincide with movement joints in the substrate and with a change in substrate material.

Control joints shall be capable of accommodating the magnitude of the following expected movement:

- (a) A separation of underlying frame to achieve an effective control joint in the gypsum lining which is aligned with the movement joint in the underlying structure [see Figure 3.4(A)].
- (b) A control joint in the gypsum lining placed at the junction of two different substrates [see Figure 3.4(B)].
- (c) A horizontal control joint at an internal mid-floor position such as a stairwell in a multi-storey building [see Figure 3.4(C)].

NOTE: When correctly designed, a full height door, window, bulkhead or archway may perform the same function as a control joint (see Paragraphs D5 and D6 of Appendix D for further information).

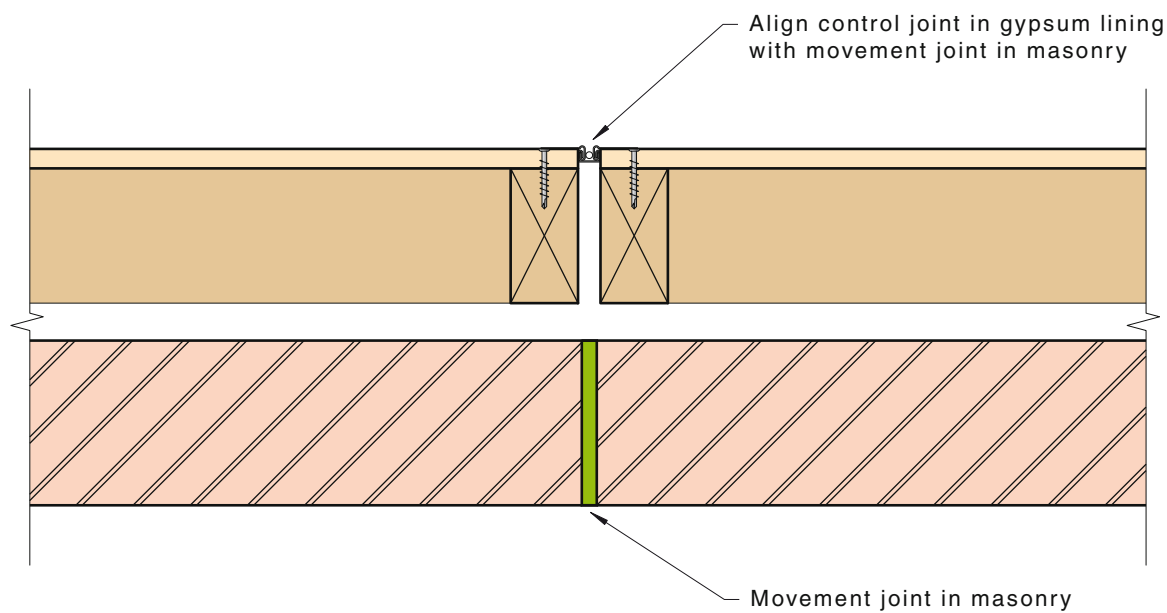


FIGURE 3.4(A) ALIGNMENT OF CONTROL JOINT IN GYPSUM LINING WITH MOVEMENT JOINT (PLAN VIEW)

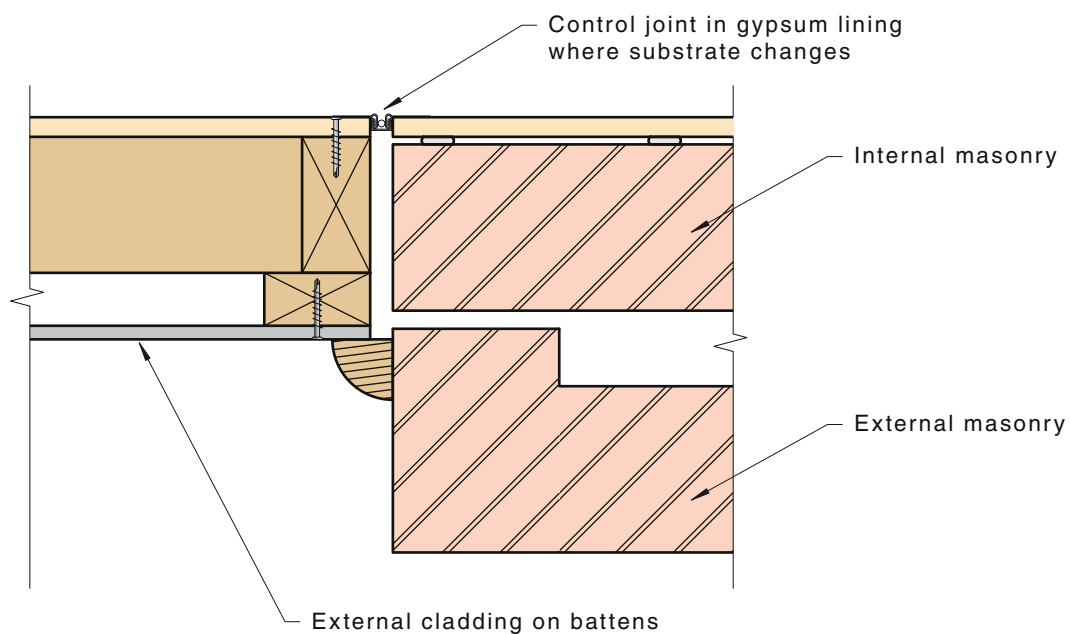


FIGURE 3.4(B) CONTROL JOINT FOR SUBSTRATE CHANGES (PLAN VIEW)

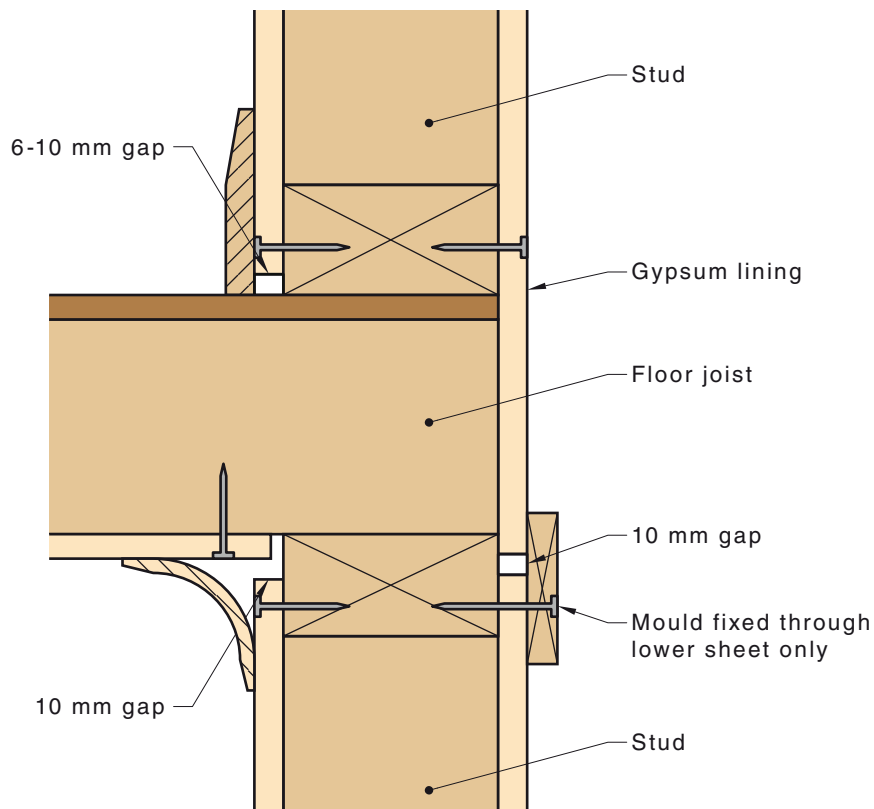


FIGURE 3.4(C) HORIZONTAL CONTROL JOINT AT AN INTERNAL MID-FLOOR POSITION

3.5 SUBSTRATES

3.5.1 General

3.5.1.1 Design considerations

In the design process, consideration shall be made of the effect of actions on substrates and the subsequent effect on gypsum linings, including deflection, physical change in materials due to temperature and humidity changes, seismic actions or a combination of these factors (see Clause 4.2).

NOTES:

- 1 Most substrates are subject to cyclical or reversible movement, which occurs as the environmental conditions they are subjected to changes. Thermal- and moisture-induced movement in substrates and linings can be predicted and allowed for in building design (see Paragraphs D5 and D6 of Appendix D for further information).
- 2 Suitability of gypsum linings to act as a bracing diaphragm should not be assumed unless verified by tests or rational design methods.

3.5.1.2 Serviceability limits

Substrates for wall and ceiling linings shall be designed to give satisfactory performance under the specified service conditions by controlling deflections.

NOTES:

- 1 Serviceability limit state deflection for wall and ceiling planes can be both structural and sensory, causing cracking or unacceptable deformations and detrimental sensory effects, or both.
- 2 Guidance for deflection limits is given in Table 3.5.1.2.