

Australian Standard[®]

Waterproofing of domestic wet areas



This Australian Standard® was prepared by Committee BD-038, Wet Areas in Buildings. It was approved on behalf of the Council of Standards Australia on 9 September 2010. This Standard was published on 5 November 2010.

The following are represented on Committee BD-038:

- Architectural Aluminium Fabricators Association (NSW)
 - Australian Building Codes Board
 - Australian Chamber of Commerce and Industry
 - Australian Consumer Association CHOICE
 - Australian Institute of Building Surveyors
 - Australian Institute of Waterproofing
 - Australian Tile Council
 - Building Research Association of New Zealand
 - Business New Zealand
 - CSIRO, Manufacturing and Infrastructure Technology
 - Engineered Wood Products Association of Australasia
 - Federation of Wall and Ceiling Industries Australia and New Zealand
 - Housing Industry Australia
 - Institute of Materials Engineering Australasia
 - Master Builders Australia
 - Planning South Australia
 - South Australia Housing Trust
 - TAFE NSW
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-

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard[®]

Waterproofing of domestic wet areas

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-038, Wet Areas in Buildings, to supersede AS 3740—2004, *Waterproofing of wet areas within residential buildings*.

The objective of this Standard is to set out the criteria for waterproofing wet areas within domestic buildings. It gives minimum requirements for materials, designs and installations.

The objective of this revision is to bring this Standard in line with the current waterproofing practices in the building industry.

Changes to the previous edition include the following:

- (a) Risk levels of different areas.
- (b) Appropriate details for various risk levels.
- (c) Clarification of usage definitions.
- (d) Increased ease of reference for varying conditions.
- (e) Revised design and installation techniques.

This Standard is not to be interpreted as preventing the use of materials, systems or methods that meet the design and installation criteria set out in the Standard, but are not specifically referred to herein (alternative solution).

Additional requirements may need to be considered for wet areas intended for use by people with disabilities.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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

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FOREWORD

Since the last edition of this Standard was published in 2004, it had become increasingly apparent that various methods for design and installation of waterproofing systems outlined in the document no longer represented minimum acceptable standards and a further review was required. In this document, the Committee has attempted to address these shortcomings.

This revision is intended to cover the treatment of wet areas within domestic buildings in a form that makes the application of accepted methods more relevant to the various risk levels, while presenting typical detail diagrams relevant to those applications.

Problems with waterproofing defects relate to a number of fundamentals, including the following:

- (a) Workmanship.
- (b) Understanding of material technology/properties.
- (c) Applicator skill and competence.
- (d) Application to a variety of use situations.
- (e) Changes in design trends.
- (f) Quality control, including supervision, inspection and testing.
- (g) Maintenance of waterproofing medium when disturbed.
- (h) Fixture of fittings after waterproofing and tiling.
- (i) Professional attitude and a desire to continuously improve without compromising quality, performance and contractual obligations (where they exceed minimum requirements).

This Edition of the Standard differs from the 2004 edition in that the Design Section has been removed and included in the Building Code of Australia (BCA).

STANDARDS AUSTRALIA

Australian Standard Waterproofing of domestic wet areas

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out minimum requirements for the materials, design and installation of waterproofing for domestic wet areas.

The Standard does not cover situations where flooding of the wet areas occurs through overflowing of vessels and showers or plumbing failures and excludes concrete admixtures or penetrant sealers or similar and decorative coatings.

NOTE: Appendix A provides design considerations for wet area waterproofing.

1.2 APPLICATION

This Standard applies to wet areas in Class 1, Class 2 and Class 4 buildings as defined in the BCA. It also applies to wet areas within other buildings with a similar level of use including sole-occupancy units within a Class 3 building.

NOTE: This Standard is not intended to apply to communal or group wet areas such as shower areas as in swimming pool complexes, sporting facilities and similar situations.

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

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

AS

- 1566 Copper and copper alloys—Rolled flat products
- 1684 Residential timber-framed construction
 - 1684.2 Part 2: Non-cyclonic areas
 - 1684.3 Part 3:
 - 1684.4 Part 4: Simplified—Non-cyclonic areas
- 1860 Particleboard flooring
 - 1860.2 Part 2: Installation
- 2870 Residential slabs and footings—Construction
- 2924 High pressure decorative laminates—Sheets made from thermosetting resins
 - 2924.1 Part 1: Classification and specifications
- 3600 Concrete structures
- 3700 Masonry structures

AS/NZS

- 1170 Structural design actions
 - 1170.1 Part 1: Permanent, imposed and other actions
 - 1170.2 Part 2: Wind actions
- 1860 Particleboard flooring
 - 1860.1 Part 1: Specifications

AS/NZS	
2269	Plywood—Structural
2588	Gypsum plasterboard
2908	Cellulose-cement products
2908.2	Part 2: Flat sheets
4858	Wet area membranes
BCA	Building Code of Australia

1.4 DEFINITIONS

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

1.4.1 Backing rod

A section of closed cell foam made from flexible plastics.

1.4.2 Bond breaker

A system that prevents the membrane bonding to the substrate, bedding or lining.

1.4.3 Drainage flange

A flange connected to a waste pipe, at the point at which it passes through the floor substrate, to prevent leakage and enable tile bed drainage into the waste pipe.

1.4.4 Drainage riser

A waste pipe between the floor waste and the drainage system.

1.4.5 Flashing

A strip or sleeve of impervious material dressed, fitted or built in, or a liquid-applied product, to provide a barrier to moisture movement, divert the travel of moisture, or cover a joint where water would otherwise penetrate.

1.4.6 Flashing, perimeter

A flashing used at the floor-wall junction.

1.4.7 Flashing, vertical

A flashing used at wall junctions within shower areas.

1.4.8 Floor waste

A grated inlet within a graded floor intended to drain the floor surface (see Clause 3.14.2).

1.4.9 Hob

The upstand at the perimeter a shower area.

1.4.10 Insert bath

A bath where the bath lip is installed onto a horizontal plinth or surface.

1.4.11 Maximum retained water level

The point at which surface water will start to overflow out of the shower area.

1.4.12 Membrane

A barrier that is impervious to moisture.

NOTE: A barrier may be a single or multi-part system.

1.4.13 Membrane, external

A membrane that is installed behind the wall sheeting or render.

NOTE: Usually external membranes are preformed trays or sheet material systems.

1.4.14 Membrane, internal

A membrane that is installed to the face of the wall sheeting or render.

NOTE: Usually internal membranes are liquid systems applied in situ.

1.4.15 Nib wall that forms part of shower enclosure

A low height wall that supports part of a shower screen.

1.4.16 Prefinished wall panels

Predecorated sheets or thermosetting laminated sheets that are designed for use as the final wall finish of the wet area.

1.4.17 Preformed shower base

A preformed, prefinished vessel (including integral upstands) installed as the finished floor of a shower compartment, and provided with a connection point to a sanitary drainage system.

NOTE: Shower bases are commonly made of plastics, composite materials, vitreous enamelled pressed steel, or stainless steel.

1.4.18 Shower screen

The panels, doors or windows enclosing or partially enclosing a shower area (see Clause 3.18).

1.4.19 Shower tray

An internal or external liquid or sheet membrane system used to waterproof the floor and the wall/floor junctions of a shower area.

1.4.20 Shower area

The area affected by water from a shower, including a shower over a bath.

1.4.21 Shower area, enclosed

The area enclosed by walls or screens, including hinged or sliding doors, that control the spread of water to within the enclosure.

1.4.22 Shower area, unenclosed

A shower area where, under normal use, water out of the shower rose is not contained within the shower area (see Clause 3.13.5).

1.4.23 Vessel

An open, preformed, prefinished concave receptacle capable of holding water, usually for the purpose of washing (e.g., basin, sink, bath, laundry tub).

1.4.24 Waterproof (WP)

The property of a material that does not allow moisture to penetrate through it when tested in accordance with AS/NZS 4858.

NOTE: For the purposes of this Standard, for materials deemed to be waterproof and suitable for including in a waterproofing system, see Clause 2.4.1.

1.4.25 Waterproofing system

A combination of elements that are required to achieve a waterproof barrier as required by this Standard (e.g., substrate, membrane, bond breakers, sealants and finishes).

NOTE: A waterproofing system for a bathroom floor may include lining it with a material in accordance with Clause 2.4.1, Item (a), (b) or (d) or by using a waterproof flexible sheet flooring material in accordance with Clause 2.4.1(c).

1.4.26 Water resistant (WR)

The property of a system or material that restricts moisture movement and will not degrade under conditions of moisture.

1.4.27 Water stop

A vertical extension of the waterproofing system forming a barrier to prevent the passage of moisture in the floor.

1.4.28 Wet area

An area within a building supplied with water from a water supply system, which includes bathrooms, showers, laundries and sanitary compartments and excludes kitchens, bar areas, kitchenettes or domestic food and beverage preparation areas.

1.4.29 Wicking

The action of water rising by a capillary path.

S E C T I O N 2 M A T E R I A L S

2.1 SCOPE OF SECTION

This Section sets out requirements for acceptable materials to be used in the waterproofing of wet areas.

2.2 DESIGN AND INSTALLATION

Waterproofing systems and their installation details shall be waterproof or water resistant as required by the BCA.

In addition, waterproofing systems and their installation details shall be compatible and shall resist the following:

- (a) Differential movement due to—
 - (i) actions as defined in AS/NZS 1170.1 and AS/NZS 1170.2;
 - (ii) shrinkage and expansion of substrate materials, framing and finishes;
 - (iii) temperature variations from -5°C to $+50^{\circ}\text{C}$; and
 - (iv) movement tolerances as defined in AS 2870.
- (b) Exposure to—
 - (i) cleaning chemicals [such as detergents, sodium hypochlorite (bleach)], as required by AS/NZS 4858; and
 - (ii) alkalis from cement mortar as required by AS/NZS 4858.

2.3 MOVEMENT JOINTS

The waterproofing system shall accommodate the expected movement at movement joints in the substrate.

2.4 MATERIALS

2.4.1 Waterproof

For the purposes of this Standard, the following materials used in waterproofing systems are deemed to be waterproof:

- (a) Stainless steel.
- (b) Copper, material not less than 99.9% copper, complying with the requirements for material designation 110 or 122 given in AS 1566.
- (c) Flexible waterproof sheet flooring material with waterproof joints of the sheeting.
NOTE: There is no need for a water stop at the general room doorway when using this material.
- (d) Membranes meeting the requirements of AS/NZS 4858.

2.4.2 Water-resistant substrates

For the purposes of this Standard, the following materials used in waterproofing systems, in conjunction with water-resistant surface materials in accordance with Clause 2.4.3, are deemed to be water resistant:

- (a) *Walls:*
 - (i) Concrete in accordance with AS 3600, treated to resist moisture movement.
 - (ii) Cement render treated to resist moisture movement.
NOTE: For recommended practice, see HB 161, Guide to plastering.
 - (iii) Fibre cement sheeting manufactured in accordance with AS 2908.2.
 - (iv) Water-resistant plasterboard sheeting manufactured in accordance with AS/NZS 2588.
 - (v) Masonry in accordance with AS 3700.
- (b) *Floors:*
 - (i) Concrete in accordance with AS 3600 and AS 2870.
 - (ii) Compressed fibre cement sheeting manufactured in accordance with AS 2908.2.
 - (iii) Fibre cement sheeting manufactured in accordance with AS 2908.2, and supported on a structural floor.
 - (iv) Flooring grade particleboard sheeting manufactured in accordance with AS/NZS 1860.1, and installed in accordance with AS 1860.2.
 - (v) Structural plywood manufactured in accordance with AS/NZS 2269, and installed in accordance with AS 1684.2, AS 1684.3 and AS 1684.4.

2.4.3 Water-resistant surface materials

For the purposes of this Standard, the following surface materials are deemed to be water resistant for the locations listed:

- (a) *Walls:*
 - (i) Thermosetting laminated sheet manufactured in accordance with AS 2924.1.
 - (ii) Predecorated fibre cement sheeting manufactured in accordance with AS 2908.2.
 - (iii) Tiles when used in conjunction with a substrate listed in Clause 2.4.2.
NOTE: Porous tiles can have discolouration caused by water absorption and migration.
 - (iv) Water-resistant flexible sheet wall material with sealed joints (e.g., sheet vinyl or linoleum) when used in conjunction with a substrate listed in Clause 2.4.2.
 - (v) Sanitary grade acrylic wall linings.
- (b) *Floors* (when used in conjunction with a substrate listed in Clause 2.4.2):
 - (i) Tiles.
NOTE: Porous tiles can have discolouration caused by water absorption and migration.
 - (ii) Water-resistant flexible sheet flooring material with sealed joints (e.g., sheet vinyl and linoleum.)

2.5 PREFORMED, PREFINISHED SHOWER BASES AND ENCLOSURES

Materials used in the manufacture of preformed, prefinished shower bases and enclosures shall be such that the finished product is waterproof.

2.6 SEALANTS

For the purposes of this Standard, all sealants shall be—

- (a) waterproof;
- (b) flexible;
- (c) mould-resistant; and
- (d) compatible with adjacent materials.

2.7 ADHESIVES

Adhesives used in a waterproofing system shall be—

- (a) waterproof, where used to adhere other waterproof materials; and
- (b) compatible with the materials to which they are adhered.

2.8 SHEET FASTENINGS

Substrate sheet materials shall be fastened or fixed adequately to the supporting structure.

S E C T I O N 3 I N S T A L L A T I O N

3.1 SCOPE OF SECTION

This Section sets out details for the installation of waterproof and water-resistant materials to be used in domestic wet areas of a building.

3.2 GENERAL

Where a tile bed or screed is used, the waterproof membrane shall be installed above or below the tile bed or screed.

NOTE: For the purposes of this Standard, some figures given in this Section illustrate the membrane below the tile bed or screed; however, where applicable, the membrane may be installed above the tile bed or screed.

3.3 FALLS IN FLOOR FINISHES

Where required, falls in floor finishes shall allow all surface water to drain without ponding except for residual water remaining due to surface tension.

For general bathroom floor area, the minimum fall to the waste shall be 1:100.

NOTES:

- 1 For information on falls in the floor finishes, see Appendix B.
- 2 For information on the laying of tiles to enable them to drain without retaining water, see AS 3958.1.

3.4 SHOWER FLOORS

Falls in shower floors shall be sufficient to prevent—

- (a) surface water from being retained on the shower floor (except for residual water remaining due to surface tension); and
- (b) water from discharging outside the shower area.

For shower areas with a vertical separation between the shower area and the wet area, such as a shower screen, hob, step-down or water stop, the fall to the waste shall be 1:100.

As a minimum for other shower areas, the fall shall be a minimum of 1:80.

3.5 CURING OF MATERIALS

Materials shall be cured adequately for their intended use.

NOTE: The membrane should be protected from physical and/or chemical damage until covered by the finished surfaces.

3.6 PREFORMED SHOWER BASES

Preformed shower bases shall be supported to prevent distortion or cracking, and shall be sufficiently recessed into the wall to allow the water-resistant surface materials to pass down inside the perimeter rebate over the upstands of the shower base.

NOTE: For typical base junction, see Figures 3.1(a) and 3.1(b).

When installing preformed shower bases, the integrity of the structure shall be maintained.

3.7 EDGE DETAIL FOR BATHS WITH SHOWERS OVER THEM

3.7.1 Baths to be recessed into a wall

Baths recessed into a wall shall have an integral vertical upstand lip along the side of the bath walls to enable a waterproof junction between the bath and walls.

3.7.2 Baths with a downturn lip

Baths without an integral upstand but with a downturn lip shall be installed as an insert bath, as specified in Clause 3.8.

3.7.3 Baths without an integral edge to allow for a vertical upstand for termination of waterproofing

For baths that do not have an integral edge detail to allow for a vertical termination of the waterproofing, there shall be full waterproofing of the walls and floor area and waterproofing under the bath. The enclosed space under the bath shall be ventilated.

NOTE: Ventilation is required to allow evaporation of water leaking around the edge of the bath into the enclosed airspace under the bath.

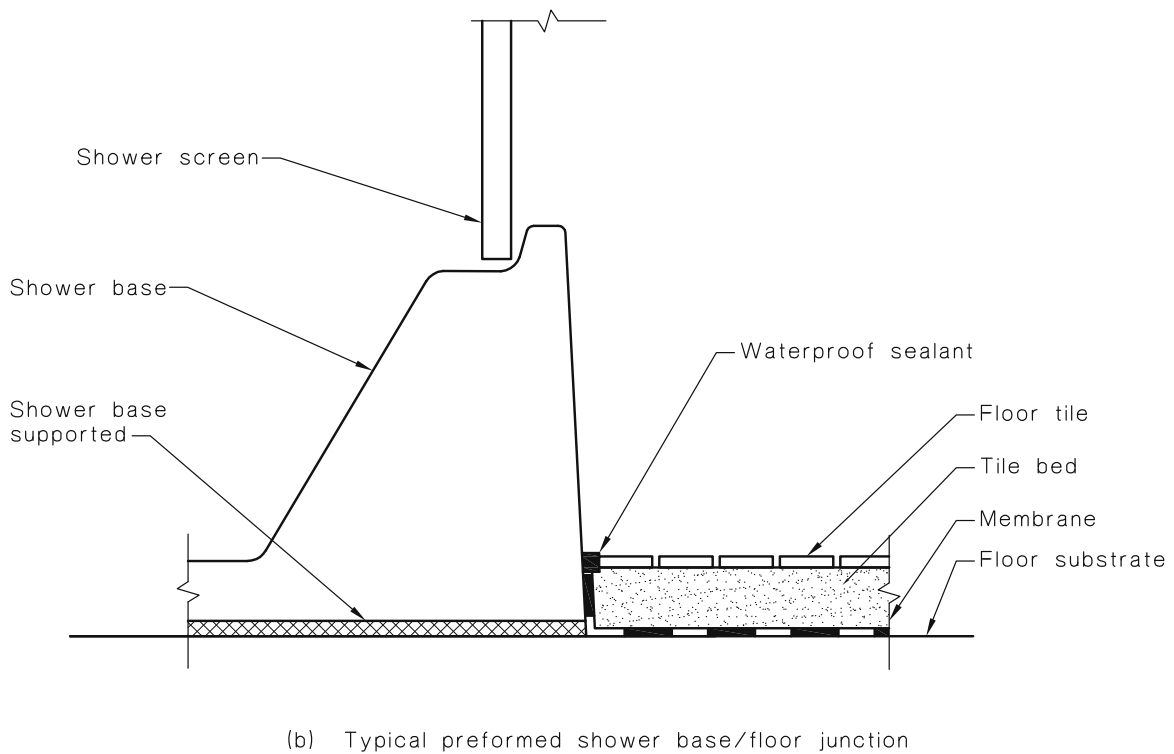
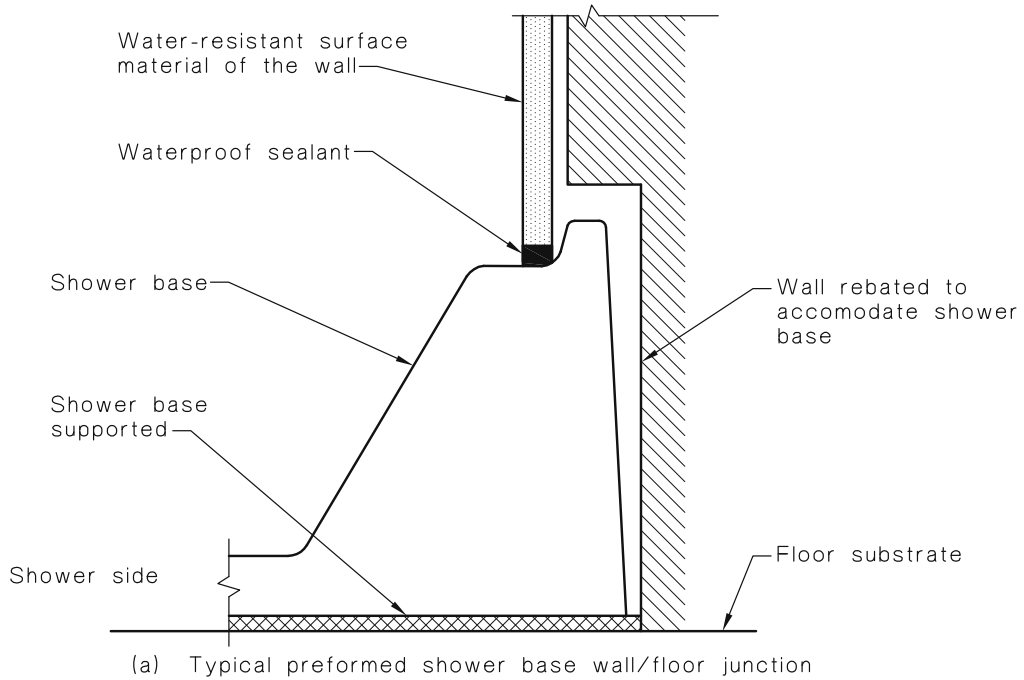


FIGURE 3.1 TYPICAL PREFORMED SHOWER BASE JUNCTIONS

3.8 BATHS AND SPAS

Baths and spas shall be supported to prevent distortion and cracking. Baths and spas that are recessed into the wall shall be installed to allow the water-resistant surface materials of the wall to pass down inside the rim of the bath or spa.

NOTE: For typical bath/spa wall junctions see Figures 3.2(a) and 3.2(b).

When installing baths and spas, the integrity of the structure shall be maintained.

For insert baths, a water stop shall be installed around the periphery.

NOTE: See Figure 3.2(c).

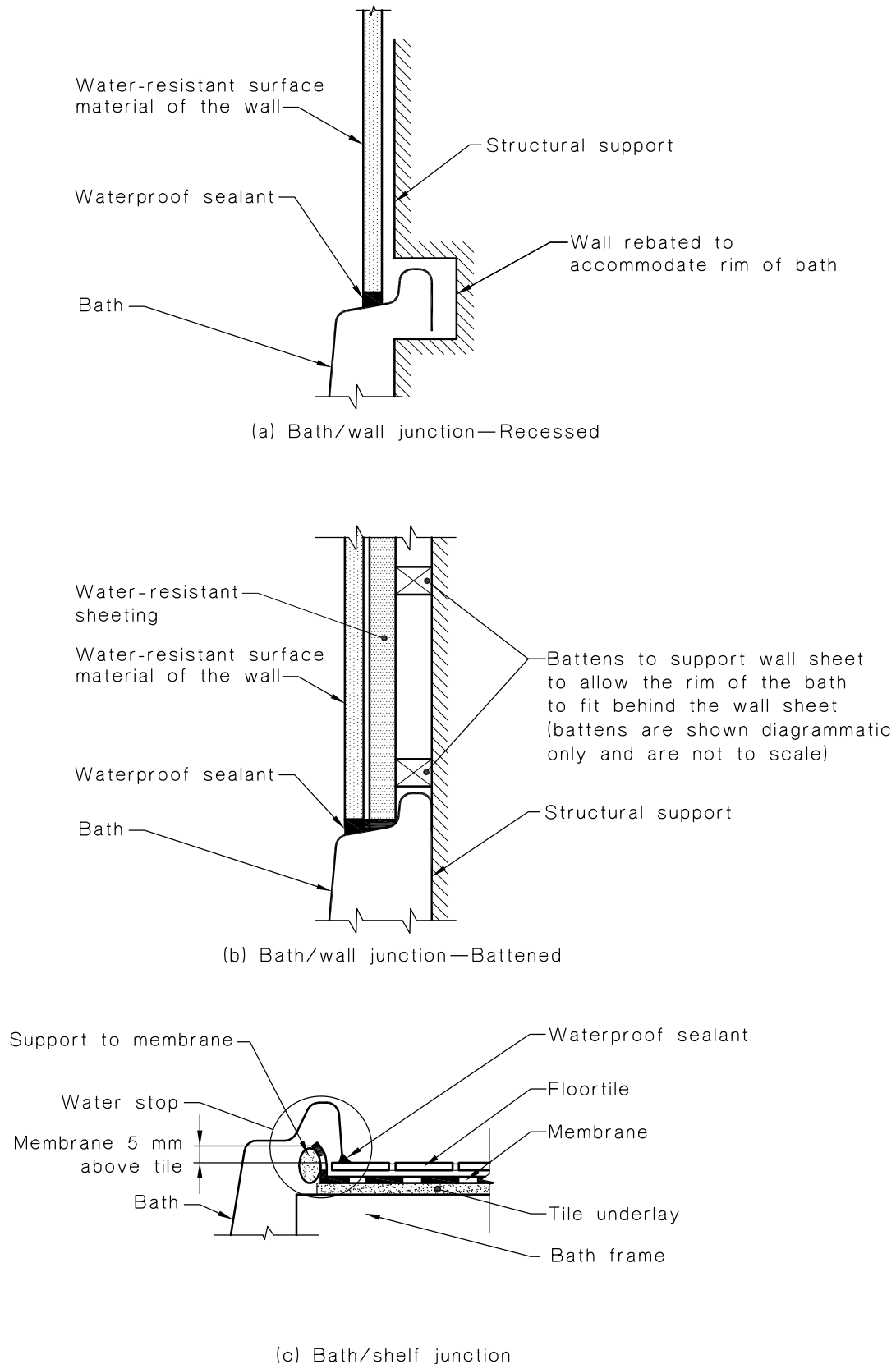


FIGURE 3.2 TYPICAL BATH JUNCTIONS

3.9 JUNCTIONS

3.9.1 Perimeter flashing

3.9.1.1 *General*

The following list specifies the minimum requirements for the treatment for various junctions. Junctions may be either wall to floor or wall to wall. Either the floor or wall may be waterproof, water resistant or have no treatment specified.

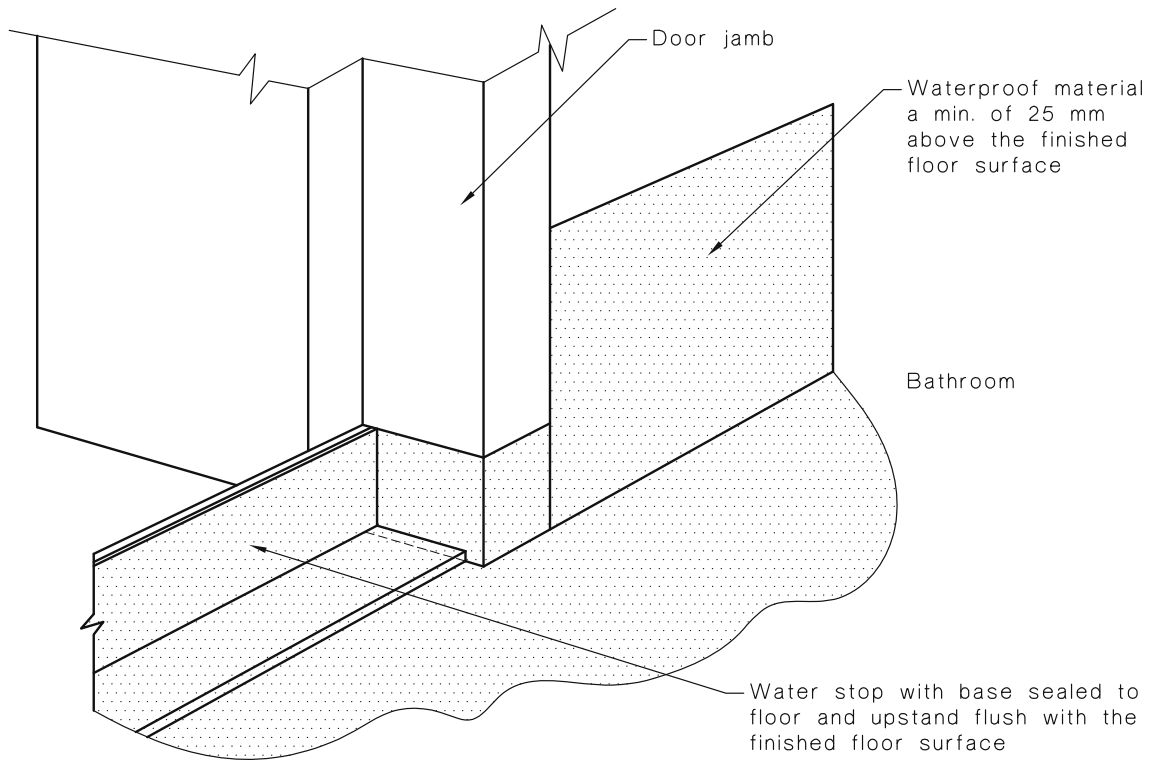
The types of junctions that shall be used are as follows:

- (a) *Type 1* Where waterproof to waterproof surfaces meet, the waterproofing shall be continuous across the junctions and, where required, incorporate an appropriate bond breaker.
- (b) *Type 2* Where waterproof to water-resistant surfaces meet, a bead of sealant shall be deemed to be a waterproof junction.
- (c) *Type 3* Where water-resistant to water-resistant surfaces meet, a bead of sealant shall be deemed to be a water-resistant junction.
- (d) *Type 4* Where non-water-resistant to water-resistant surfaces meet, a bead of sealant shall be deemed to be a water-resistant junction.
- (e) *Type 5* Perimeter flashing to wall/floor surfaces shall be continuously sealed to the horizontal surface and have a vertical leg of a minimum of 25 mm above the finished floor level, except across doorways, and the horizontal leg shall be a minimum width of 50 mm.

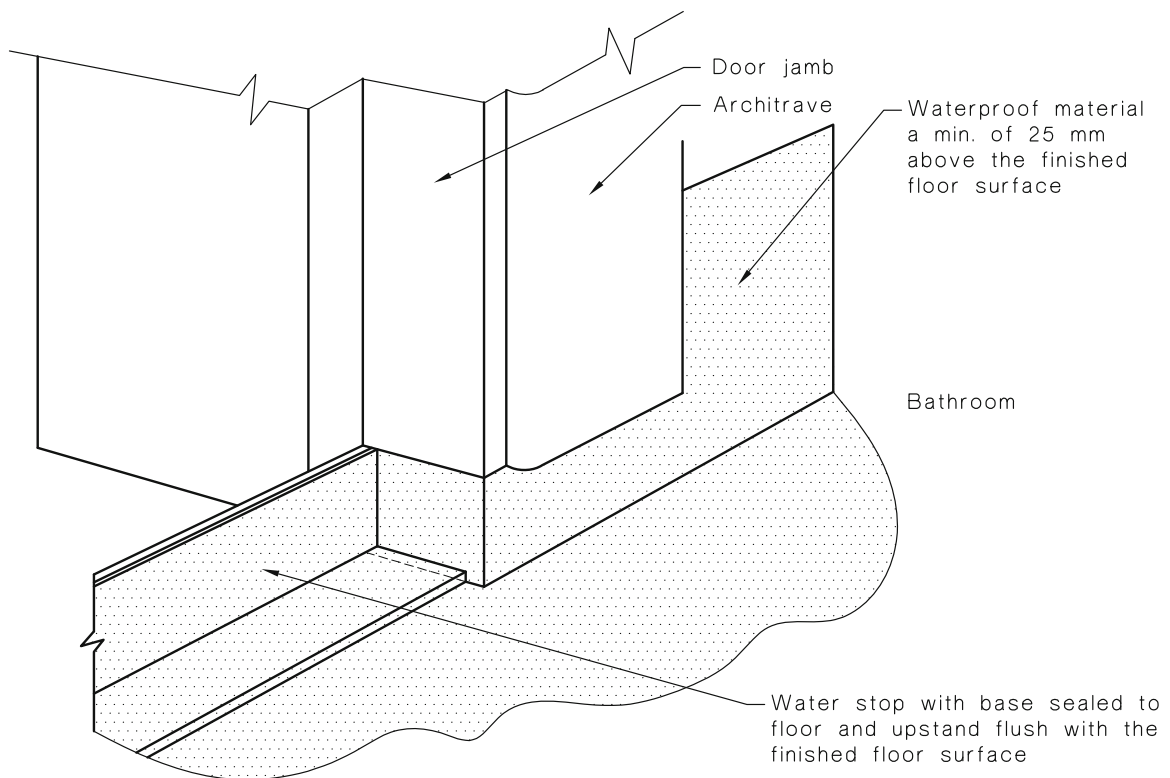
3.9.1.2 *Perimeter flashing at floor level openings*

The following applies:

- (a) *For whole wet area floor waterproofing* A water stop that has a vertical leg finishing flush with the top of the finished floor level shall be installed at floor level openings. The floor membrane shall be terminated to create a waterproof seal to the water stop and to the perimeter flashing.
NOTE: For typical bathroom detail for whole bathroom waterproofing, see Figures 3.3(a) and 3.3(b).
- (b) *For other than whole wet area floor waterproofing* A water stop that has a vertical leg finishing flush with the top of the finished floor level shall be installed at floor level openings. The water stop shall be waterproofed to the perimeter flashing.



(a) Prior to installation of architrave



(b) After installation of architrave

FIGURE 3.3 TYPICAL BATHROOM DOOR DETAIL FOR WHOLE BATHROOM WATERPROOFING

3.9.2 Vertical flashing for shower wall junctions

Vertical flashing may be external or internal and shall terminate a minimum of 1800 mm, above the finished floor level or to the height of the wall, whichever is the lesser.

Vertical flashing may be used as follows:

- (a) External vertical flashing may be used with external membranes systems and installed behind the wall sheeting or render, provided they have legs of sufficient width to allow the wall sheeting or render to overlap by a minimum of 30 mm. (The mechanical fastening of the wall sheeting shall not penetrate the flashing.)
- (b) Internal vertical flashing may be used with both external and internal membrane systems, provided each leg has a minimum overlap of 40 mm to the wall sheeting or render and, where used with—
 - (i) internal membranes, each leg extends vertically from within the shower tray;
 - (ii) external membranes, each leg overlaps the top edge of the floor waterproofing system, by a minimum 20 mm; and
 - (iii) preformed shower bases or baths, each leg extends to the bottom edge of the wall sheeting or render.

3.10 PENETRATIONS

3.10.1 Shower areas

Penetrations for taps, shower nozzles, recessed soap holders and similar fixtures shall be waterproofed by sealing with proprietary flange systems or a sealant. When sealing the tap body to the wall, allowance shall be made for the servicing of tap washers or ceramic disks without damaging the seal.

NOTE: Typical detail for recessed soap holders is shown in Figure 3.4.

For mixer taps, drainage shall be allowed at the base of the cover plate.

Any penetrations of mechanical fixings or fastenings through surface materials shall be waterproofed.

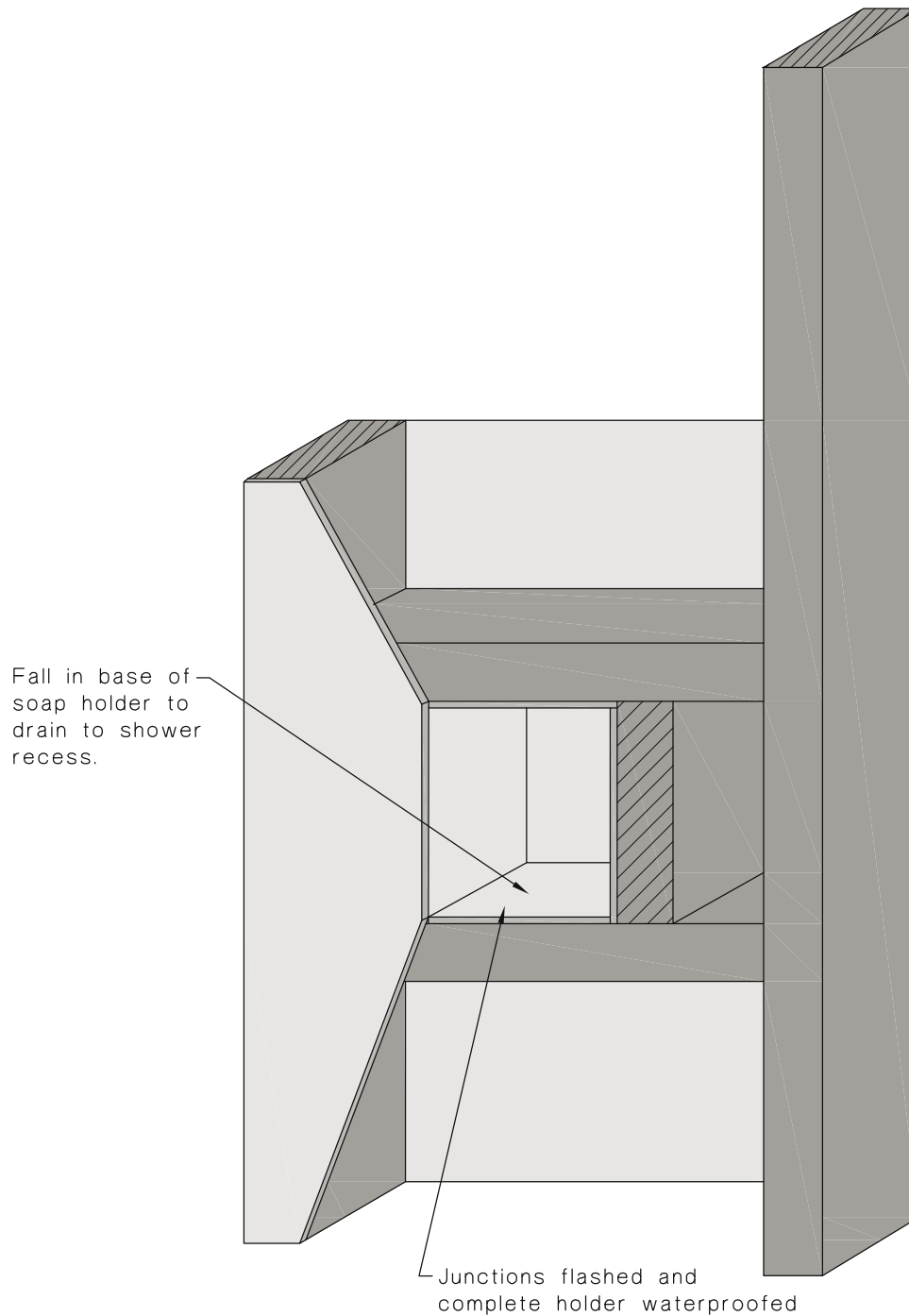


FIGURE 3.4 TYPICAL DETAIL FOR RECESSED SOAP HOLDERS

3.10.2 Tap penetrations through horizontal surfaces

Tap penetrations on horizontal surfaces surrounding baths and spas shall be waterproofed by sealing with proprietary flange systems or the tap body to the membrane, or substrate where a membrane is not required.

3.11 REQUIRED FLOOR WASTES FOR WET AREA FLOORS

Where a floor waste is required, the floor finish shall be constructed so that water flows to the waste without water being retained on the finished surface with the exception of residual water remaining due to surface tension.

NOTE: For additional information on floor gradients, see Appendix B.

3.12 WALL SHEETING OR RENDER

Where wall sheeting or render is used with an external membrane system in a shower area, it shall—

- (a) not extend into the floor tile bed; or
- (b) be waterproofed to prevent moisture movement by capillary action or wicking.

For water-resistant plasterboard sheeting, all cut edges that have the potential to be affected by moisture shall be waterproofed, including the bottom edge over a preformed shower base. The water-resistant plasterboard sheeting shall be kept a minimum of 5 mm above the preformed shower base to allow effective sealing of the cut edge of the plasterboard.

3.13 GENERAL SHOWER AREA REQUIREMENTS

3.13.1 Substrate surface preparation for application of a membrane

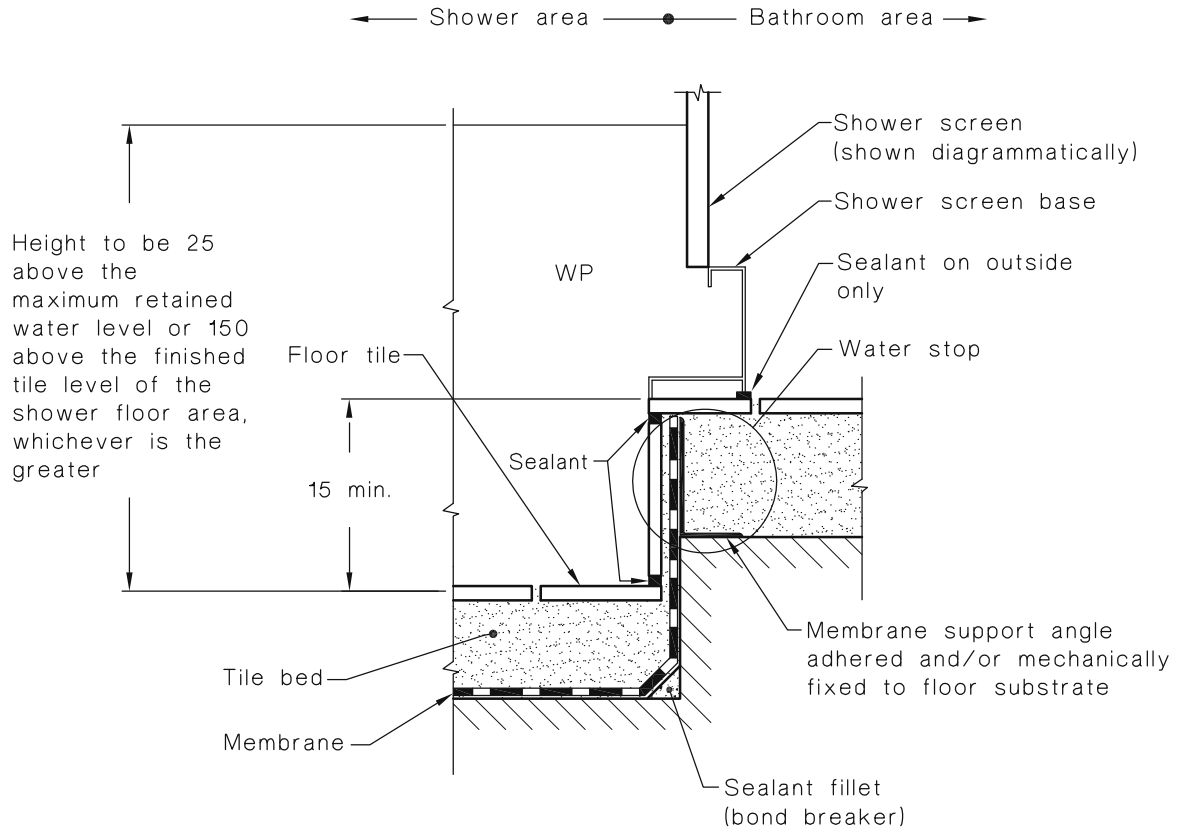
The area shall be cleaned and dust free. Indentations and imperfections shall be kept to a minimum and repaired where necessary.

3.13.2 Step-down showers

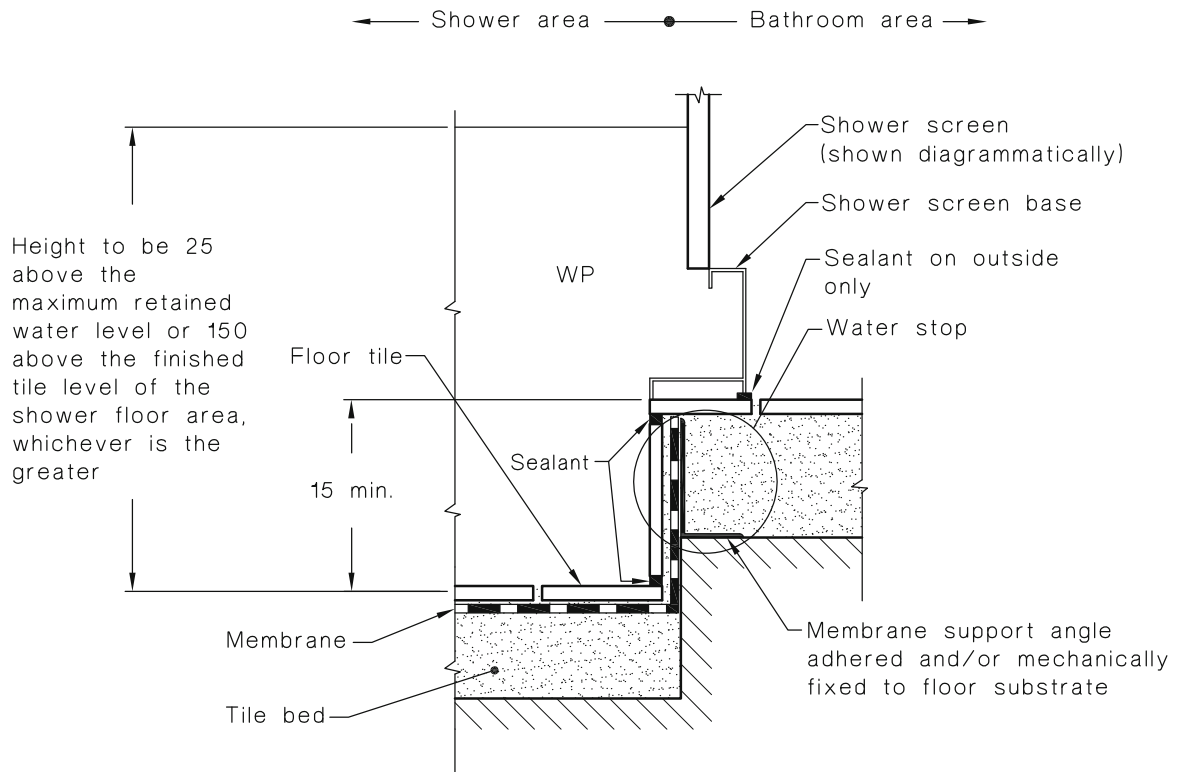
The highest finished floor level of the shower area shall be stepped down lower than the finished floor level outside the shower

NOTE: For examples, see Figure 3.5.

For set-downs less than 15 mm, details shall be in accordance with Clause 3.13.4 or Clause 3.13.5, as appropriate.



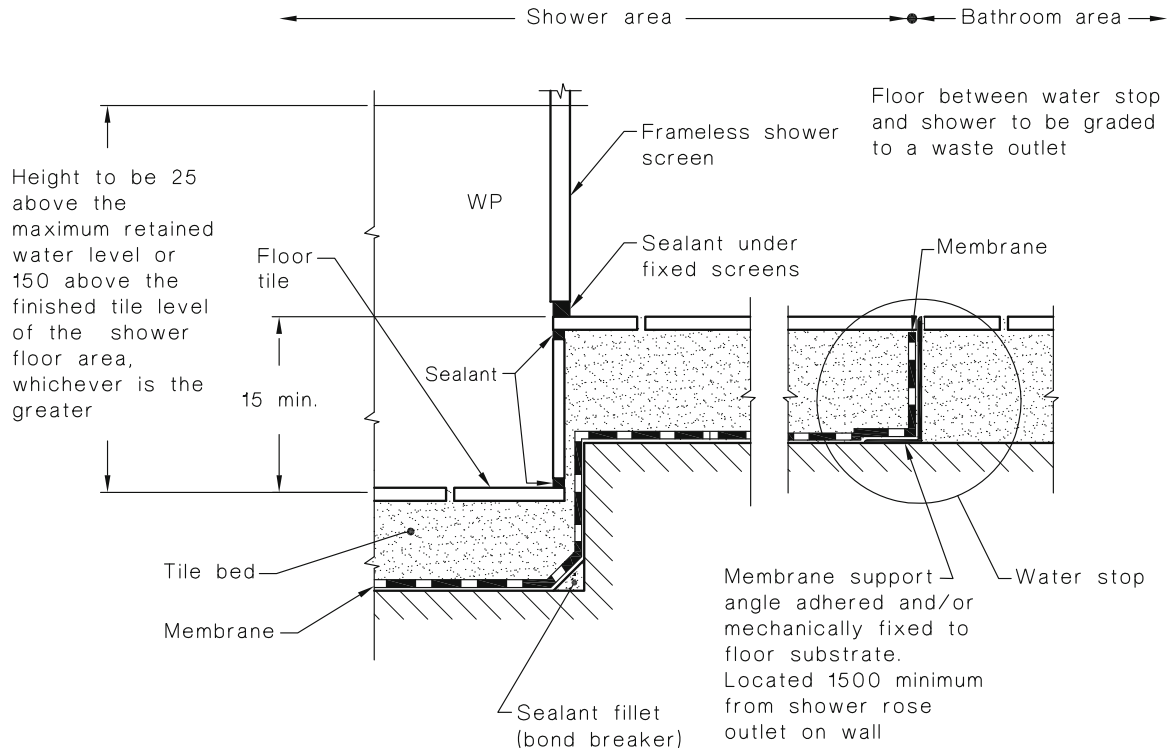
(a) Enclosed shower—Membrane below tile bed



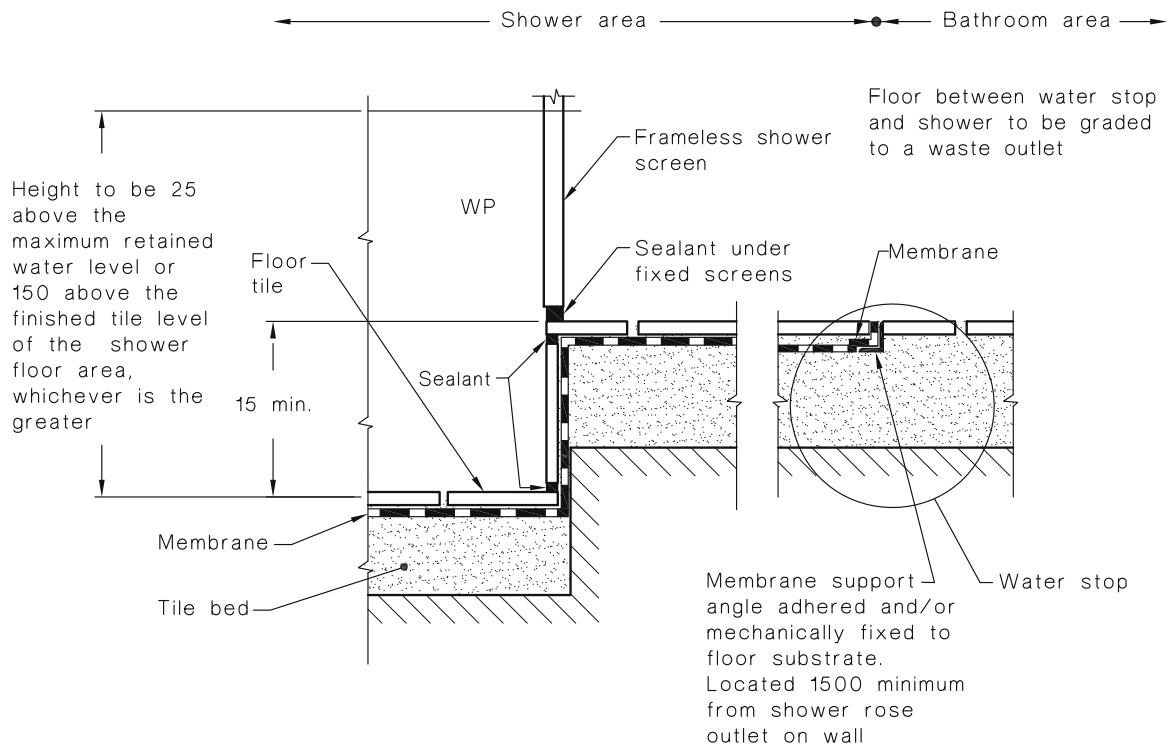
(b) Enclosed shower—Membrane above tile bed

DIMENSIONS IN MILLIMETRES

FIGURE 3.5 (in part) TYPICAL STEPPED DOWN SHOWER CONSTRUCTION



(c) Unenclosed shower—Membrane below tile bed



(d) Unenclosed shower—Membrane above tile bed

DIMENSIONS IN MILLIMETRES

FIGURE 3.5 (in part) TYPICAL STEPPED DOWN SHOWER CONSTRUCTION

3.13.3 Hob construction

Substrate for hobs shall be constructed of masonry, concrete, corrosion-resistant metal or similar material. Autoclaved aerated concrete may be used for internal membrane systems but shall not be used for external membrane systems. Where used, autoclaved aerated concrete shall be primed before the application of the membrane. All gaps, joints and intersections of the hob substrate shall be made flush before application of the membrane. The hobs shall be adequately secured to the floor and sealed against the wall prior to applying an internal membrane.

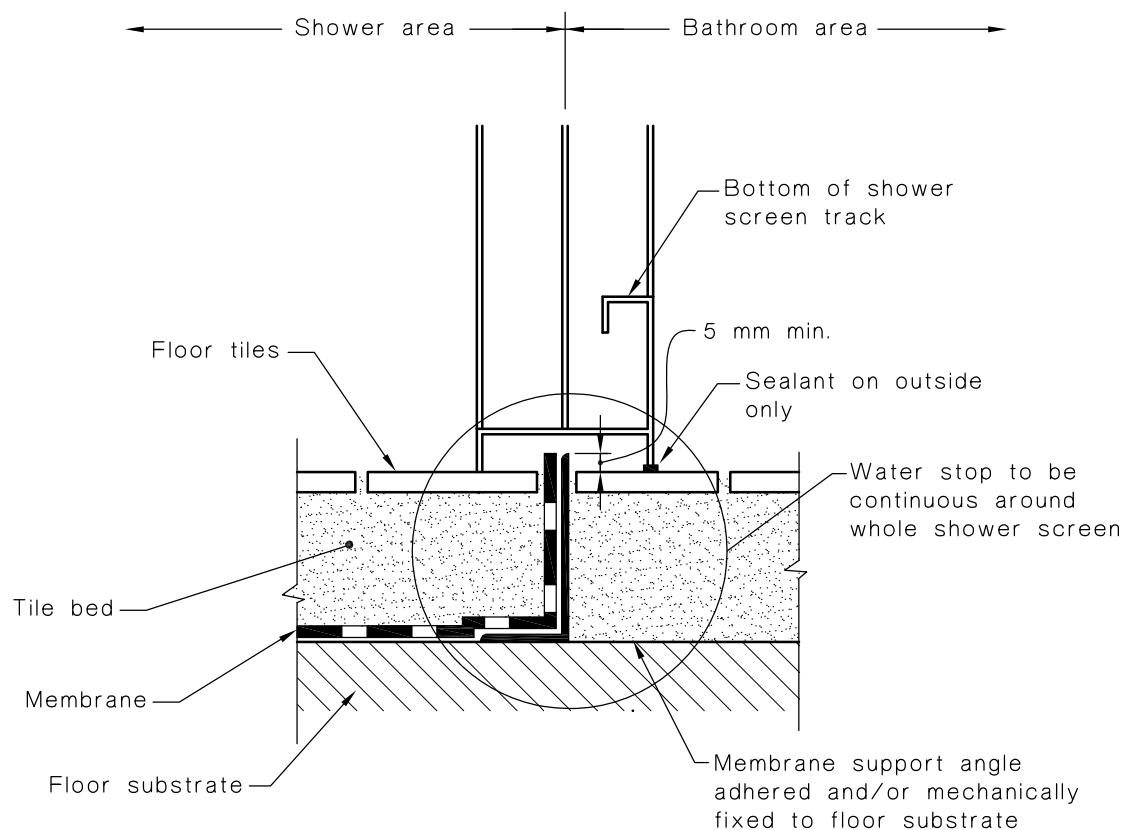
Timber shall not be used for hob construction.

3.13.4 Enclosed showers without hobs or set-downs

At the extremity of the shower area—

- (a) where a shower screen is to be installed, a water stop shall be positioned so that its vertical leg will finish a minimum of 5 mm above the finished floor level (see Figure 3.6); and
- (b) where the water stop intersects with a wall or is joined, the junction shall be waterproof.

NOTE: For a typical hobless construction, see Figure 3.6.



NOTE: Some shower screen extrusions may not permit the water stop extending into a rebate. A channel section may be needed to be installed over the water stop angle with the shower screen placed on top of the channel including return panels.

FIGURE 3.6 TYPICAL HOBLESS CONSTRUCTION

3.13.5 Unenclosed showers

This Clause sets out requirements for two types of unenclosed showers, as follows.

NOTE: See also Clause 3.18.1.1.

- (a) *Type 1* A Type 1 unenclosed shower has a device that will restrict splashing during use (see Note 1).

A water stop shall be placed under the device and across the opening of the shower of a Type 1 shower screen.

NOTES:

- 1 A example of a Type 1 unenclosed shower is a frameless glass shower screen.
- 2 It is advisable to have either the screed drained or a membrane placed on the top of the screed to prevent water retention in the screed beyond the water stop.

- (b) *Type 2* A Type 2 unenclosed shower does not have a device that will restrict splashing.

NOTE: An example of a Type 2 unenclosed shower is a shower for people with disabilities.

The water stop of a Type 2 shower shall be a distance of a minimum of 1500 mm from the wall connection of the shower rose.

For Type 1 and Type 2 unenclosed showers, the water stop shall have the vertical leg finish flush with the finish surface of the floor and, where the water stop intersects with or joins a wall, the junction shall be waterproof.

NOTE: If absorbent types of stone are used for flooring, they may discolour from shower water out to 1500 mm water stop. Efflorescence may also form in tile joints outside the shower area, and building elements such as vanity skirtings on the floor within the water stop area may deteriorate.

3.13.6 Additional requirements for bath end walls abutting a shower

Where a bath end wall is within a shower area, it shall be treated as a shower area wall.

3.13.7 Bond breaker installation for bonded membranes

Bond breakers shall be included at all wall/floor, hob/wall junctions and at movement joints where the membrane is bonded to the substrate. Bond breakers shall be of the type compatible with the flexibility class of the membrane to be used.

NOTES:

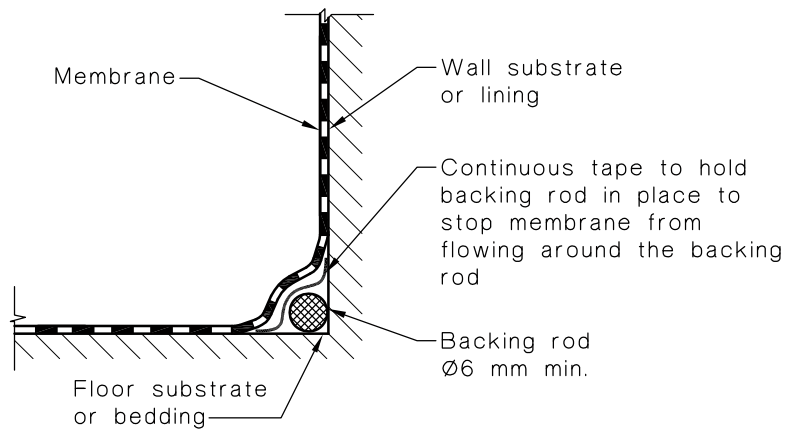
- 1 For appropriate bond breakers, see Table 3.2.
- 2 Typical details for bond breakers are shown in Figure 3.7.
- 3 Additional information on bond breakers is given in Appendix A.

TABLE 3.2
APPROPRIATE BOND BREAKER

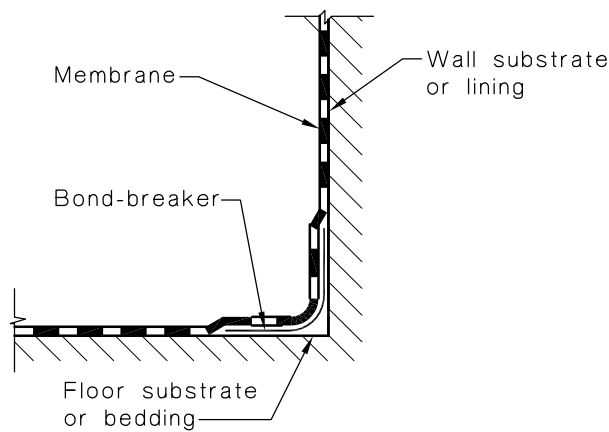
Membrane class	Elongation at break	Minimum bond breaker/tape width to bridge joints opening up by 5 mm
I	<60%	75 mm with backing rod
II	60% to 300%	35 mm
III	>300%	12 mm

NOTES:

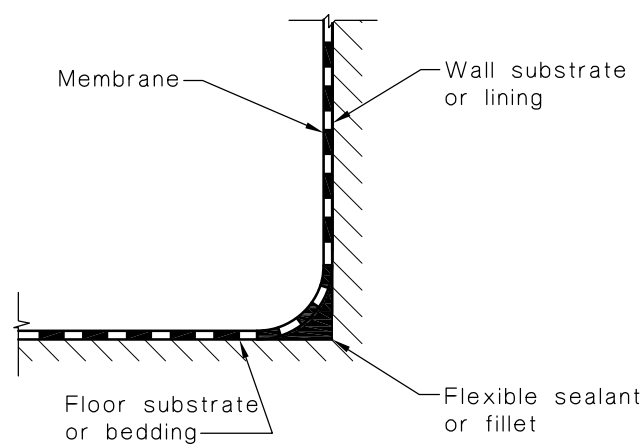
- 1 Bond breakers for Class I membranes (low extensibility) allow the membrane to flex rather than stretch.
- 2 Bond breakers for Class II membranes (medium extensibility) allow the membrane to stretch. If a tape is used as a bond breaker, either the membrane will not bond to the tape or the tape will have elastic properties similar to the membrane; for example, for a Class II membrane, a 35 mm wide bond breaker/tape should be applied over a joint to accommodate the joint opening up by up to 5 mm.
- 3 Bond breakers for Class III membranes (high extensibility) allow the membrane to have even thickness.



(a) Class I membrane



(b) Class II membrane



(c) Class III membrane

FIGURE 3.7 TYPICAL BOND BREAKER DETAILS

3.13.8 Vertical membrane termination

The membrane shall be applied over the floor substrate and up the vertical face of the wall—

- (a) for showers with hobs and step-downs, a minimum height of 150 mm above the finished tile level of the floor or 25 mm above the maximum retained water level, whichever is the greater;
- (b) for hobless showers, a minimum height of 150 mm above the highest finished tile level of the floor within the shower area; and
- (c) for vertical flashing in shower areas, as specified in Clause 3.9.2.

3.14 MEMBRANE TO DRAINAGE CONNECTION

3.14.1 Termination to a drainage flange

For membrane drainage connections in other floors, any one of the following shall apply:

- (a) A drainage flange shall be installed with the waterproofing membrane terminated at/in the drainage flange to provide a waterproof connection.

NOTES:

- 1 For typical membrane termination at drainage outlet, see Figure 3.8.
 - 2 Drainage flanges may be set into the floor or fixed to the top surface of the floor substrate or tile bed.
- (b) Where a prefabricated shower tray is used, provision shall be made to drain the tile bed and provide a waterproof connection to the drain.

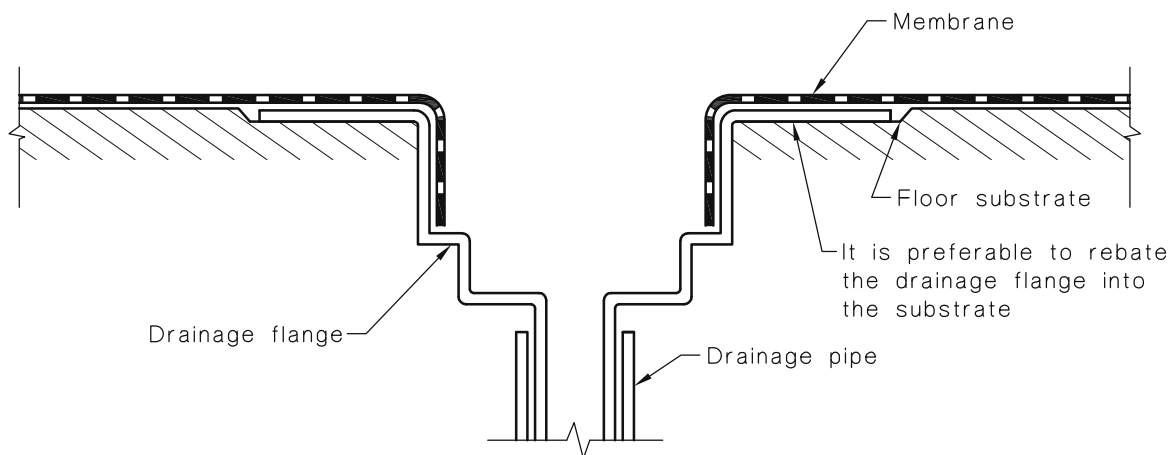


FIGURE 3.8 TYPICAL MEMBRANE TERMINATION AT DRAINAGE FLANGE

3.14.2 Floor waste

The floor waste shall be of sufficient height to suit the thickness of the tile and tile bed at the outlet position. The drainage flange/floor waste shall drain at the membrane level.

3.14.3 Termination to a drainage channel

The waterproof drainage shall be continuous for the membrane into the drainage outlet. Where the drainage channel does not have an integral horizontal surface of 50 mm for termination of the membrane, the membrane shall be continuous underneath the drainage channel, terminating at a recessed drainage flange.

NOTE: For a typical application of a membrane termination to a drainage channel, see Figure 3.9.

When the drainage channels are installed against a wall, they shall not compromise the waterproofing requirements of the wall/floor junctions.

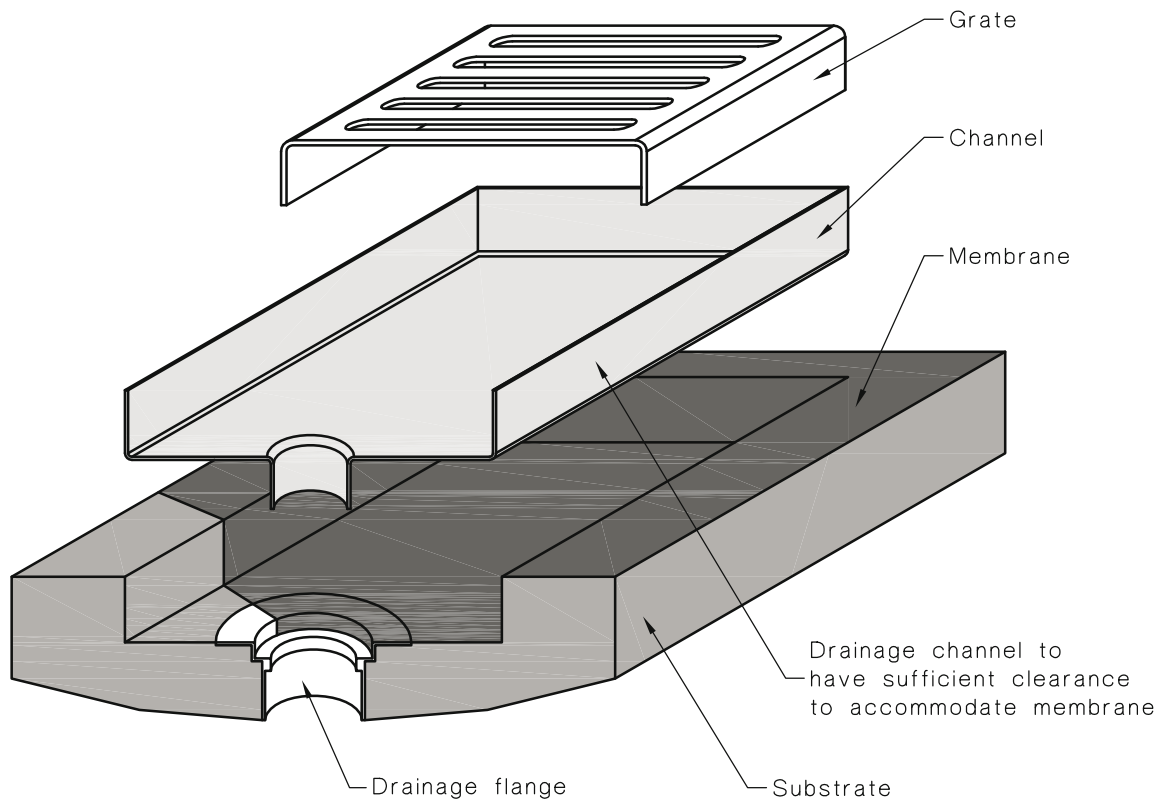


FIGURE 3.9 TYPICAL MEMBRANE TERMINATION AT DRAINAGE CHANNEL

3.15 INSTALLATION OF AN INTERNAL MEMBRANE

3.15.1 Membrane application

3.15.1.1 General

In addition to the requirements of Clauses 3.12 and 3.13, the requirements of this Clause shall apply also for internal membranes.

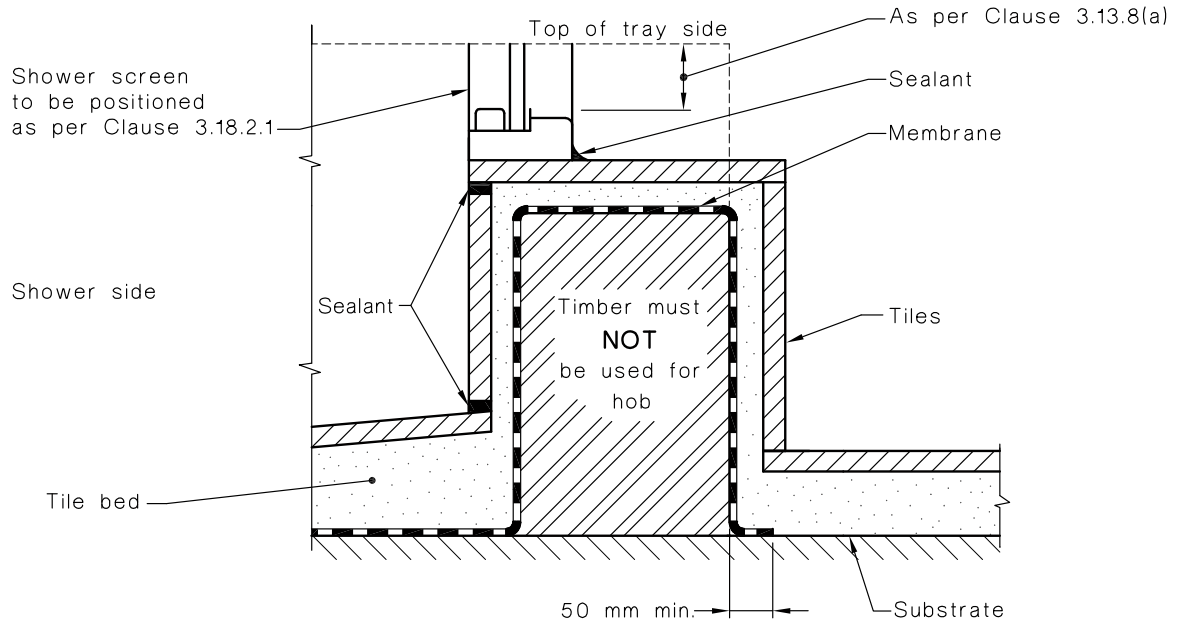
3.15.1.2 Termination of membranes at showers with hobs

With the exception of metal angle hobs, the membrane shall be brought up over the top of the hob, down the outside face and terminate a minimum 50 mm onto the floor.

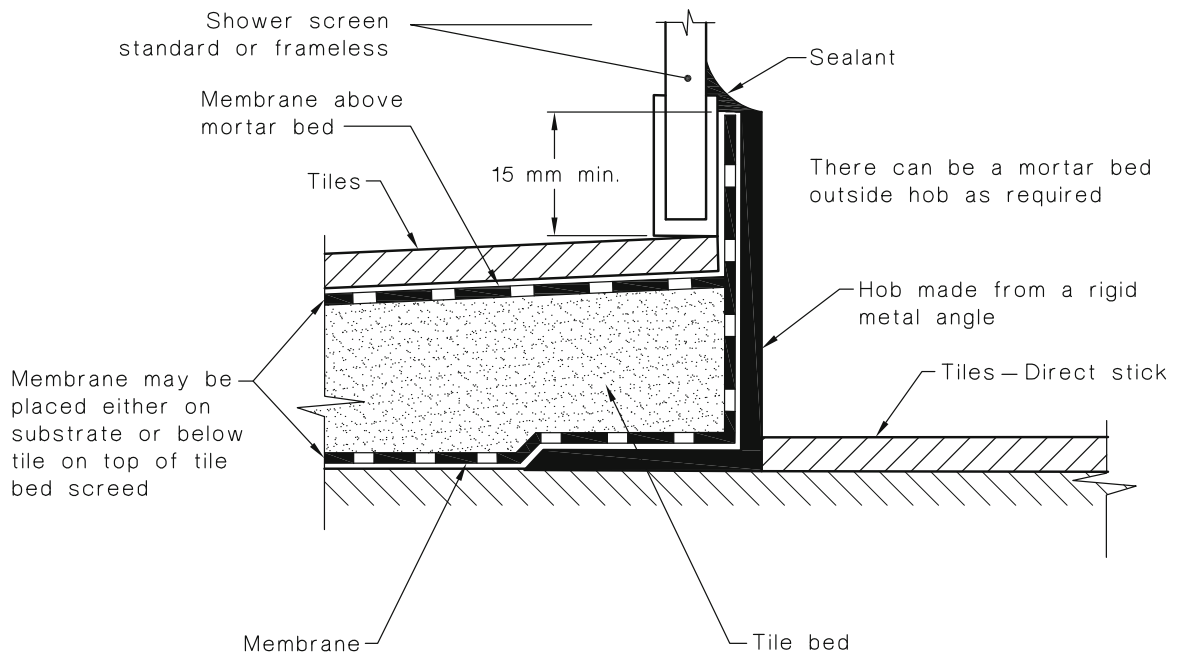
NOTE: For a typical application, see Figure 3.10.

For metal angle hobs, the membrane shall be terminated within 5 mm from the top of the angle, and any gap between the shower screen and the angle shall be filled with a sealant.

The extent of the membrane for an internal shower tray shall be as shown in Figure 3.11(a).



(a) Enclosed shower with hob



(b) Enclosed shower on flat substrate

NOTE: Membrane shown on substrate and above the tile bed for diagrammatic purposes only.

FIGURE 3.10 TYPICAL HOB CONSTRUCTION—INTERNAL MEMBRANE

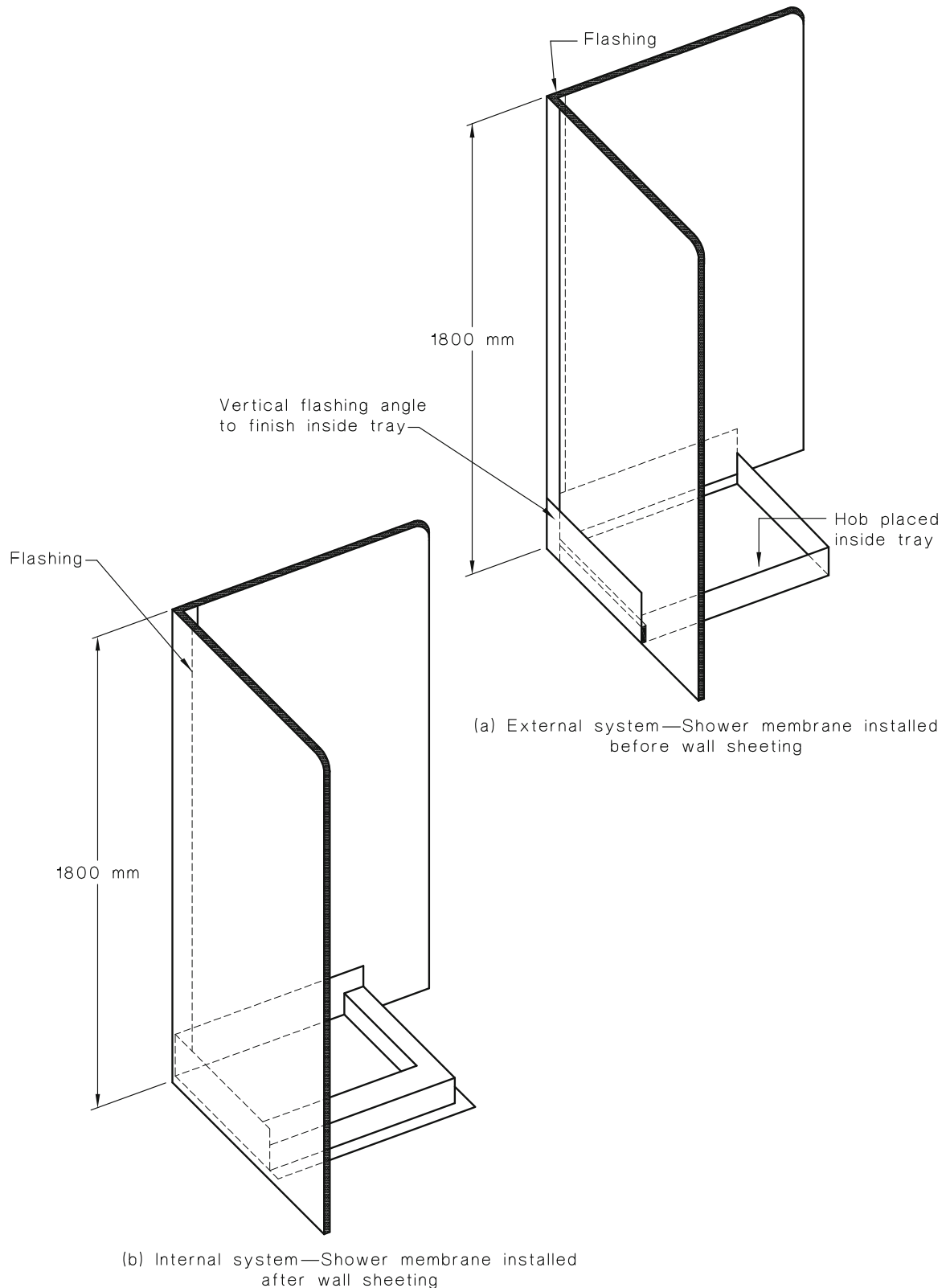


FIGURE 3.11 SHOWER CONSTRUCTION

3.15.1.3 *Termination of membranes at enclosed showers without hobs*

The membrane shall be brought to the top of the floor finish, except where it is under a shower screen where it shall terminate a minimum of 5 mm above the finished tile surface.

NOTE: For a typical application, see Figure 3.6.

3.16 INSTALLATION OF AN EXTERNAL MEMBRANE

3.16.1 Membrane application

3.16.1.1 General

Where the membrane is fabricated from a flexible material, the top edges shall be fixed to the wall. Fixing penetrations shall be a minimum of 100 mm above the finished tile level of the shower area. All fixings shall be compatible with the membrane and shall be non-corrosive.

3.16.1.2 Showers with hobs

The hob shall be included within the finished size of the shower membrane and the membrane shall finish at the underside of the tile that forms the top of the hob.

NOTE: Typical hob construction for an external membrane is shown in Figure 3.12.

The extent of the membrane for an external shower tray shall be as shown in Figure 3.11.

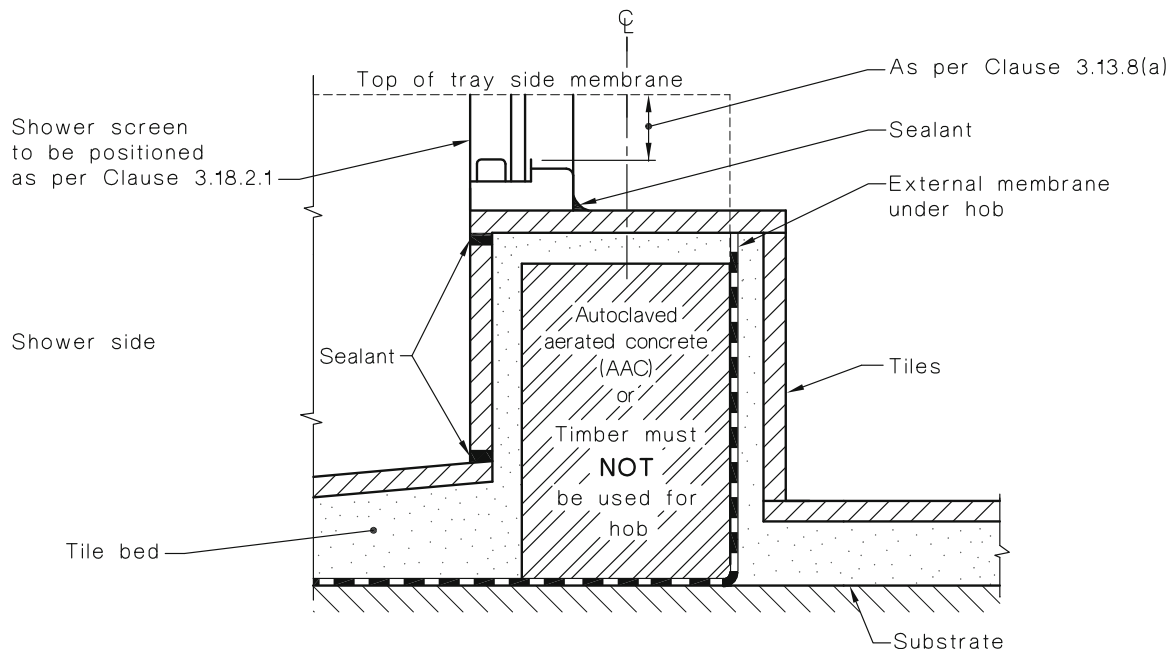


FIGURE 3.12 TYPICAL HOB CONSTRUCTION—EXTERNAL (PREFORMED) MEMBRANE

3.16.2 Base termination of vertical flashing

Vertical flashings in internal corners shall extend into the external membrane by a minimum of 25 mm.

3.16.3 Drainage riser connection

3.16.3.1 Preformed trays

The drainage riser shall be connected to the tray with a waterproof joint.

3.16.3.2 Made in situ shower trays

A drainage flange shall be installed with the waterproofing membrane terminating in the drainage flange at not less than 20 mm.

The membrane shall be able to form a permanent seal to the drainage flange.

NOTE: For a typical membrane extension, see Figure 3.8.

3.17 DOORJAMBS AND ARCHITRAVES

Where the bottom of doorjambs and architraves do not finish above the floor tiling, the portion of the doorframes and architraves below the floor tiling shall be waterproofed to provide a continuous seal between the perimeter flashing and the water stop.

NOTES:

- 1 For typical door detail, see Figure 3.3.
- 2 Where possible, the doorjambs and architraves should be installed above the floor tiling.

3.18 SHOWER SCREEN

3.18.1 General

3.18.1.1 *Unenclosed shower screen*

An unenclosed shower screen consists of—

- (a) a frameless shower screen, unless the shower screen is fitted with seals and deflectors, all of which control the spread of water from the shower area; or
- (b) a shower screen less than 900 mm long over a bath; or
- (c) a shower area where a curtain is hung on a rod.

Unenclosed shower areas are not suitable for use directly adjacent to doorways unless the doorway is protected against water exiting through the doorway.

3.18.1.2 *Enclosed shower screen*

For an enclosed shower, the shower screen shall be designed and installed to prevent the spread of water from the shower enclosure.

An enclosed shower screen consists of—

- (a) a fully framed (including sill) shower screen where the water from the shower rose is controlled to within the shower area; or
- (b) a partly or semi frameless shower screen where the vertical edges of the unframed panels are fitted with suitable seals or where panels overlap one another (and where a sill is included); or
- (c) a frameless shower screen that is fitted with seals and deflectors, to control the spread of water within the shower area.

NOTE: Where a shower screen is classified as unenclosed, the water stop and the positioning of the waterproofing of the floor should be as specified in Clause 3.13.5.

3.18.2 Enclosed shower screen placement

3.18.2.1 *Showers with hobs*

The shower screen shall be installed so as to ensure it is—

- (a) flush with the shower area side of the hob;
- (b) overhanging in to the shower area; or
- (c) inside the hob.

NOTE: A self-draining sub-sill is considered to be part of the shower screen.

3.18.2.2 *Showers with step-downs*

The shower screen shall be installed so as to ensure it is—

- (a) flush with the finished vertical surface of the step-down
- (b) overhanging into the shower area; or
- (c) inside the step-down of the shower area.

3.18.2.3 *Showers without hobs or step-downs*

The shower screen shall incorporate or be mounted on an inverted channel, and positioned over the top of the water stop that defines the shower area.

NOTE: For a typical hobless construction, see Figure 3.6.

3.18.2.4 *Bath end walls and nib walls abutting a shower*

The shower screen shall be positioned so that the bottom edge within the shower area is either flush with the outside edge of the bath or overhanging into the shower area.

NOTE: A self-draining sub-sill is considered to be part of the shower screen.

APPENDIX A
DESIGN CONSIDERATIONS IN WET-AREA WATERPROOFING
(Informative)

A1 SCOPE

This Appendix provides information that should be considered when designing waterproofing systems for wet areas in domestic buildings and includes guidelines for dealing with the degree of risk, and the types of materials used and their locations in the construction.

A2 LEAKAGE THROUGH FINISHES

Water may penetrate wall and floor finishes in wet areas, depending on the frequency, the intensity and the length of time these surfaces are exposed to water; if not intercepted, water may damage the moisture-sensitive materials lying beneath, and sometimes reach adjoining rooms and their finishes. Consequently, careful attention should be paid to the design and installation of all materials, components and systems to prevent damage by water.

Water penetration mainly occurs at joints. Grouted joints will often shrink, producing cracks that allow water to pass through. At floor and wall junctions, these cracks can be caused or enlarged by movement of the structure, substrate or finishes.

A3 MOVEMENT AND WATERPROOFING

A3.1 General

Movement in the wall and floor structure is often caused by contraction, expansion or settlement. Users of this Standard should be aware of the need for waterproofing materials or systems to accommodate the expected movement of the structure.

A3.2 Structure movement

A3.2.1 *Frame movement*

Potential movement of corner studs is restricted if the studs are fastened to intermediate blocking pieces. Where the framing is constructed of metal or seasoned timber, blocking is generally a provision to restrict structural deflection.

Unseasoned timber requires additional consideration for movement and its subsequent effects upon the waterproofing system.

A3.2.2 *Masonry movement*

Masonry products such as clay-based materials, cement-based materials and autoclaved aerated materials may be subject to specific movement characteristics depending on the material used. These products also require consideration of movement and its subsequent effects upon the waterproofing system.

A3.2.3 *Panel movement*

Panel products are also subject to movement, particularly at joints. Such products also require consideration of movement and its subsequent effects upon the waterproofing system.

A3.3 Wall linings under tiles in shower areas

While it is considered that the faces of the nominated linings are impervious enough to shield wall framing against damage from water that penetrates tiled finishes in wet areas, the joints between lining sheets and their junctions with other materials may require special attention to intercept or stop the natural path of water through them.

Of major concern are the vertical corner joints and the perimeter joints where the potential for shrinkage and structural movement of the framing is greatest. Therefore, vertical corner joints should be provided with flashing angles and sealant for surface finishes.

A3.4 Prefinished wall panels

Vertical joints between panels and their horizontal junctions with other materials should be carefully considered, as the panels are the only barrier between the water and the framing beneath. All joints between panels should be either flashed or waterproofed with a sealant, and the bottoms of panels installed to overlap adjoining materials.

A3.5 Floors

A3.5.1 General

Waterproof barriers are required to prevent downward or sideways movement of water into adjoining construction or rooms.

Water naturally penetrates tiled floor finishes more readily than wall finishes. Where a tile bed is used, a waterproof membrane may be installed above or below the tile bed. Where a membrane is installed above a tile bed, it is essential that the tile adhesive be compatible with the membrane.

Where the membrane is under the tile bed, the tile bed tends to become a reservoir of moisture. A drainage system should be provided within the tile bed, over an in situ membrane. This allows the reservoir of moisture to discharge into the waste fitting or pipe (see Figure 3.8).

A3.5.2 General requirements of barriers

In order to maintain waterproofing integrity, trays or flashing angles should be installed in a manner that allows for the expected movements of the supporting structure. In situ membranes and flashings should be able to cover floor-to-wall and wall-to-wall joints without tearing or breaking under the forces exerted on them when movement occurs in the adjacent elements to which they are fixed.

For framed construction, prefabricated flashing angles should be adhered only to the floor, allowing the sides of the vertical legs to accommodate the differential movement between walls and floors.

A3.5.3 In situ barriers—Properties and installation

Some of the materials specified for in situ membranes or flashings are not considered sufficiently elastic to stretch without tearing, or flexible enough to bend without breaking when subjected to joint movement. Therefore, such barriers should not be applied directly across the joint, and should be completely bonded to both adjacent surfaces. The correct approach is to first install a ‘bond-breaker’ at the wall/floor junction. This bond-breaker may consist of any of the following depending on the class of the membrane:

- (a) A flexible closed cell foam-backing rod combined with a suitable bond-breaker tape.
- (b) A suitable sealant.
- (c) Bond-breaker tape.

The method used should be directly related to the type of membrane installed. More rigid membrane and flashing materials, which bend rather than stretch, are better suited for use with a backing rod and bond-breaker tape (see Figure 3.7).

A3.5.4 *Set-downs*

Vertical edges of the set-downs should align flush with the wall substrate to avoid creating voids, cavities or protrusions. They should be repaired prior to installation of a waterproofing system, as they are the cause of many waterproofing problems.

A3.5.5 *Tiles within shower area*

Small dimension tiles used in shower areas enable the tiler to achieve the necessary fall to the waste as the size of the tiles increase adequate falls become more difficult to achieve.

APPENDIX B
FALLS IN FLOOR FINISHES
(Informative)

B1 GENERAL

The primary consideration for falls in floor finishes is to ensure water does not remain on the finished floor in a manner that can adversely affect the health or amenity of the occupants or deteriorate building elements.

Falls in floor finishes should ensure water exits the area at the floor waste or doorway if that is the designed exit point (e.g., laundry door to exterior). Water should not pond on the floor, with the exception of residual water remaining due to surface tension.

B2 FACTORS AFFECTING FALLS

The ratio of fall achieved in a floor may vary depending upon the—

- (a) finished height requirements at doorways;
- (b) height of fixtures or fittings;
- (c) dimensions of the tiles used, adequate falls become more difficult to achieve as the size of the tiles used increases;
- (d) area of the floor to be drained; and
- (e) requirements of persons with disabilities.

B3 FALL RATIOS

Clause 3.4 specifies a fall ratio of 1:100 in shower areas.

Where falls flatter than 1:100 are proposed, the effectiveness of the floor drainage should be confirmed to ensure the primary consideration given in Paragraph B1 has been met.

B4 DIAGONAL CUTTING OF TILES

Tiles may require diagonal cutting in the area around the waste to achieve the required falls, sufficient drainage and to ensure lipping is kept within the guidelines of AS 3958.1.

BIBLIOGRAPHY

- AS 3958 Ceramic tiles
- AS 3958.1 Part 1: Guide to the installation of ceramic tiles
- HB 161 Guide to Plastering

NOTES

NOTES

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