

4320 TILE ROOFING

1. GENERAL

If you have pre-customised this work section using the "questions and answers" provided as part of the downloading process, it may be necessary to amend some clauses to suit the final project-specific version.

The section must still be checked and customised to suit the project being specified, by removing any other irrelevant details and adding project-specific details and selections.

This section relates to the supply and installation of tile roof, complete with all roof underlays and accessories to create a watertight roof.

Modify or extend the above description to suit the project being specified.

Refer to 3820 CARPENTRY for plywood sarking and for insulation products. Add project-specific clauses when insulation products are to be supplied and/or laid with the roofing. Alternately provide references to 4230 WALL CLADDING, 4161 UNDERLAYS, FOIL AND DPC or 3820 CARPENTRY.

Add project-specific clauses when roofing-type products are used as external sheathing on fascias, parapets and walls.

Add project-specific clauses when rainwater goods (spoutings, downpipes, gutters) are to be supplied and/or laid with the roofing, or alternately provide cross references to 7411 RAINWATER SPOUTING SYSTEMS.

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External Moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
NZS 2295	Pliable, permeable building underlays
NZS 3602	Timber and wood-base products for use in building
NZS 3604	Timber-framed buildings
NZS 4206	Concrete interlocking roofing tiles
NZS 4217	Pressed metal tile roofs
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire

Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.

The following are related documents and if referred to in the work section need to be added to the list of DOCUMENTS:

NZBC E2/VM1	External moisture
BRANZ BU 561	Timber-frame parapets, balustrades and columns
BRANZ BU 567	E2/AS1 Flashing Requirements
BRANZ BU 528	Metal Tile Roofing

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

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Copies of the above literature are available from ~

Web: ~

Email: ~

Telephone: ~

Facsimile: ~

It is important to ensure that all personnel on site have access to accurate, up to date technical information on the many products, materials and equipment used on a project. In most cases individual products are not used in isolation, but form part of a building process. Also a particular manufacturer's and/or supplier's requirements for handling, storage, preparation, installation, finishing and protection of their product can vary from what might be considered the norm. Access to technical information can help overcome this potential problem.

Warranties

- 1.3 WARRANTY - MANUFACTURER/SUPPLIER METAL TILES
Provide a material manufacturer/supplier warranty:
25 years: For tile materials
5 years: For coating
- Provide this warranty on the manufacturer/supplier standard form.
 - Commence the warranty from the date of practical completion of the contract works.
- Refer to the general section 1237 WARRANTIES for additional requirements.
Modify or expand the clause to suit project or manufacturer/supplier requirements, options include:
- *Change the standard form to be used (check with the manufacturer/supplier, use the general section 1237WA WARRANTY AGREEMENT if required)*
 - *Commence the warranty from the date of purchase (check with the manufacturer/supplier)*
- 1.4 WARRANTY - MANUFACTURER/SUPPLIER CONCRETE TILES
Provide a material manufacturer/supplier warranty:
50 years: For tile materials
- Provide this warranty on the manufacturer/supplier standard form.
 - Commence the warranty from the date of practical completion of the contract works.
- Refer to the general section 1237 WARRANTIES for additional requirements.
Modify or expand the clause to suit project or manufacturer/supplier requirements, options include:
- *Change the standard form to be used (check with the manufacturer/supplier, use the general section 1237WA WARRANTY AGREEMENT if required)*
 - *Commence the warranty from the date of purchase (check with the manufacturer/supplier)*
- 1.5 WARRANTY - INSTALLER/APPLICATOR
Provide a material installer/applicator warranty:
5 years: For installation
- Provide this warranty on the installer/applicator standard form.
 - Commence the warranty from the date of practical completion of the contract works.
- Refer to the general section 1237 WARRANTIES for additional requirements.
Modify or expand the clause to suit project or installer/applicator requirements, options include:
- *Change the standard form to be used (check with the installer/applicator, use the general section 1237WA WARRANTY AGREEMENT if required)*
 - *Commence the warranty from the date of purchase (check with the installer/applicator)*
- Requirements**
- 1.6 QUALIFICATIONS
Carry out roofing work using experienced, competent roofers familiar with the materials and techniques specified.
- 1.7 FIXINGS, WIND
Design and use the fixings appropriate to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.
This clause is setting a standard of performance for design by the contractor, to meet. Specifiers should therefore consider adding some means of confirming (say by testing or certification) that the performance criteria will be or has been met.
Ensure correct information is supplied in 1220 PROJECT.
Delete the clause if it does not apply and the contractor is not expected to design.
- 1.8 CO-ORDINATE
Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof.
- 1.9 PERFORMANCE
Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.
Refer to later EXECUTION clause on co-operating with others on the installation of elements which penetrate or adjoin the roofing system; including walls and parapets, skylights, sundry elements fixed through the roofing surface, service pipework, etc.

2. PRODUCTS

2.1 TIMBER BATTENS

To [NZS 3604](#), 10.2.1.16.7 - **Tile Battens**.

Type: Radiata pine, SG8

Treatment: H1.2, Boron (code 11) or PTP (code 64)

With masonry tiles like concrete, do not use timber treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89), as they may cause corrosion in steel and galvanised steel.

Max span of batten;

Up to 480mm: 50mm x 25mm batten

430mm - 600mm: 50mm x 40mm

600mm - 900mm: 50mm x 50mm

The type can be changed to Douglas fir, and the grade can be modified.

H1.2 is the minimum Radiata treatment to NZBC B2/AS1, this is quite low compared to a cavity batten, for absorbent tiles consider a higher treatment, like H3.2 CCA (preservative code 01 or 02) if necessary.

Modify if using NZBC B2/AS1, 3.2.2.2. Exceptions for the use of untreated Douglas fir.

Modify this clause when counter-battening is required (i.e. when rafters run across the roof slope).

Specify valley boards, tilting battens, anti-ponding boards and verge boards elsewhere.

WARNING: BRANZ have indicated severe metal corrosion problems in steel and galv steel, in wet environments, with the timber treatments CuAz (58) and ACQ (90). The related micronised coppers may also cause similar problems. To avoid this specify treatments like Boron or PTP for H1.2, or CCA (preservative code 01 or 02) for H3.2, or use stainless steel metal items.

2.2 WIRE NETTING

Galvanized hexagonal 75mm mesh from 1mm steel wire to [AS/NZS 4534](#).

Use this clause only if specifying a non-self supporting roofing underlay.

2.3 UNDERLAY

Breather type kraft paper laminates to [NZS 2295](#).

Roofing underlay is required under all types of pressed metal tile roofs.

Roofing underlay is required under all types of Masonry tile, concrete tile and clay tile roofs, unless specific requirements are met (including type of tile profile). If considering the use of Masonry, concrete or clay tiles without roofing underlay, refer to the requirements of table 10 E2/AS1 and supporting clauses.

Modify if using synthetic underlays.

Specify underlays here if not included in 4710 INSULATION or 4161 UNDERLAYS, FOIL AND DPC.

Modify or add to this clause for flame proof or reinforced roofing underlay, foil-backed insulation, or a vapour barrier to suit the project brief. Modify or add the EXECUTION clauses similarly.

2.4 METAL ROOFING TILES

Pressed steel sheet galvanized, or aluminium/zinc coated to AS 1397. Finish as specified. Accessories, capping, flashings, and fixings to match and to the roofing manufacturer's requirements.

Amend this clause to suit; and to suit alternative selections such as copper. Note that special care is needed when using aluminium/zinc coated products, to ensure compatibility with flashings, spouting, downpipes and external sheathing.

2.5 CONCRETE ROOFING TILES

To [NZS 4206](#). Finish as specified. Accessories, capping, flashings, fixings and mortar pointing to match and to the roofing manufacturer's requirements.

A flexible pointing compound (Flexipoint) is available. Refer to BRANZ Appraisal 335. Amend this clause to suit clay tiles.

2.6 ANTI-PONDING BOARD - CONCRETE TILES

To [NZBC E2/AS1](#). H1.2 timber or H3 plywood to minimum 1.12 fall.

Required if underlay used.

- 2.7 FLASHINGS GENERALLY
To E2/AS1, 4.0 **Flashings**. Formable grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel.
Revise the clause wording to suit the specified roofing.
- 2.8 FIXINGS METAL TILES
50x2.8mm hot-dip galvanised painted flat-head annular grooved nails, plus neoprene washers when top fixing, to **NZBC E2/AS**, 8.3.7, **Fixings**, and to tile manufacturer's requirements.
- 2.9 FIXINGS FOR MASONRY TILES - DURABILITY
Design and use the fixings appropriate for the project Exposure Zone (to **NZS 3604** & **NZBC E2/AS1**) stated in the general section 1220 PROJECT. Refer to SELECTIONS.

Exposure Zone Tile fixing type

B, C Hot-dip galvanised or stainless steel

D, E Stainless steel

Galvanised can be used with timber batten treatments like Boron (code 11) or PTP (code 64) for H1.2, or CCA (preservative code 01 or 02) for H3.2, for other treatments use stainless steel in all zones.

- 2.10 NAILS FOR MASONRY TILES
For 50mm thick battens only, nails to **NZS 4206**, penetrating the batten by 35mm minimum but not through it.
Nail size;
Length: 35mm plus tile thickness
Diameter: 2.5mm
Refer SELECTIONS for type and finish.
Suitable for 50mm thick tile battens only, for compliance with NZBC E2/AS1, 8.2 Masonry Tiles.

- 2.11 SCREWS FOR MASONRY TILES
Stainless steel to **NZS 4206** with neoprene washer for all batten thicknesses.
Screw size;
Length: 18mm plus tile thickness
Diameter: 2.5mm
Suitable for tile battens 50mm thick or less, for compliance with NZBC E2/AS1, 8.2 Masonry Tiles.

3. EXECUTION

- 3.1 STORAGE
Stack roofing and accessories on clean, level areas of the site and protect from damage and from weather until ready to fix in place. Avoid overloading roof structure when roofing materials are placed on the roof area prior to installation.

- 3.2 SET-OUT
Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.
Refer to drawings or give design parameters where layout is particularly critical to appearance.

- 3.3 LAY ROOF UNDERLAY
Lay and fix to **NZBC E2/AS1**: 8.1.5, **Roof Underlays** and the roofing manufacturer's requirements.
*Roofing underlay is required under all types of pressed metal tile roofs.
Roofing underlay is required under all types of Masonry tile, concrete tile and clay tile roofs, unless specific requirements are met (including type of tile profile). If considering the use of Masonry, concrete or clay tiles without roofing underlay, refer to the requirements of table 10 E2/AS1 and supporting clauses.*

Amend this clause to suit actual requirements for underlays, depending on roof type and location.

- 3.4 LAY ROOFING, GENERALLY
To **NZBC E2/AS1**: 8.0 **Roof claddings**. Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface.

- 3.5 **INSTALL TILE BATTENS**
To [NZS 3604](#), 10.2.1.16.7 - **Tile Battens**. Install the tile battens to the roofing manufacturer's requirements and with all joints fully supported and staggered.
Purlins are usually supplied and fixed under 3820 CARPENTRY, or occasionally under the Structural Steelwork section. Prepare a further project-specific clause where nailer plates/purlins are supplied as part of the roofing work.
- 3.6 **CUT METAL TILES**
Cut with tools specified by the roofing manufacturer. Fold ends and seal cut edges of tiles and accessories without damaging their integrity or finish, all to the roofing manufacturer's requirements.
- 3.7 **INSTALL METAL TILES**
Lap metal tiles and fix complete with matching accessories, flashed to roof features and penetrations; all to the roofing manufacturer's requirements and [NZS 4217](#) and to [NZBC E2/AS1: 8.3 Pressed metal tiles](#).
Refer more specifically to standard roofing manufacturer's details where applicable.
- 3.8 **INSTALL CONCRETE TILES**
Install concrete tiles and fix with metal fixings every second tile in a row and all perimeter and eaves tiles. Incorporate matching accessories, flash to roof features and penetrations, with anti-ponding boards and under-cloaks where required, to the roofing manufacturer's requirements and [NZS 4206](#) and to [NZBC E2/AS1: 8.2 Masonry tiles](#).
Refer more specifically to standard roofing manufacturer's details where applicable.
- 3.9 **FIXINGS**
Refer to the roofing manufacturer's literature for fixing details and to [NZBC E2/AS1](#).
- 3.10 **INSTALL COVERS AND FLASHINGS**
Cut, fit and fix all elements true to line and plane, to [NZBC E2/AS1: 4.0 Flashings](#), [NZBC E2/AS1: 5.0 Roof/wall junctions](#), and to the roofing manufacturer's details.
Refer to manufacturers' or included details where applicable.
- 3.11 **PENETRATIONS**
To [NZBC E2/AS1](#). Flash and overflash all penetrations through the roof.
Expand this very general clause to better describe the various types and forms of penetrations needing to be flashed.
- 3.12 **PENETRATIONS AND JUNCTIONS**
Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:
 - underlay turned up at wall and parapet lines
 - underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
 - roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
 - installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).
- 3.13 **USE OF SEALANTS**
Select and use sealants only as recommended by the roofing manufacturer.
Using sealants as a primary weatherseal is not advisable. Where used as a secondary barrier, take special care to confirm that substrates and sealants are compatible and include the roofing manufacturer's details where available. Note also that silicone sealants tend to attract and hold dust and debris.
- 3.14 **COMPLETE**
Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.
Provide cross references to 7411 RAINWATER SPOUTING SYSTEMS where applicable.
- 3.15 **REMOVE FILINGS**
Remove metal filings from roofing surfaces at least daily.

3.16 CLEAR
Clear trade rubbish and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes, ensuring that metal filings, metal scraps and loose fixings are removed.

Non-removal of metal filings and unused fixings is a continual problem and source of unsightly surface marking. Consider adding in a special inspection clause on periodic and final cleaning.

3.17 REPLACE
Replace damaged or marked elements. Remove unused materials from the site.

4. SELECTIONS

Materials

4.1 ROOFING UNDERLAY

Underlay: ~

Safety mesh: ~

Roofing underlay is required under all types of pressed metal tile roofs.

Roofing underlay is required under all types of Masonry tile, concrete tile and clay tile roofs, unless specific requirements are met including type of tile profile. If considering the use of Masonry, concrete or clay tiles without roofing underlay, refer to the requirements of table 10 E2/AS1 and supporting clauses.

Amend to suit the required form and type of underlay and support required. Refer to 4161 UNDERLAYS, FOIL AND DPC.

4.2 METAL ROOFING TILES

Brand/type: ~

Coating: ~

Flashings: ~

Fixing: 50x2.8mm hot-dip galvanised painted flat-head annular grooved nails

Amend this clause to suit; and to suit alternative selections such as copper. Note that special care is needed when using aluminium/zinc coated products, to ensure compatibility with flashings, spoutings, downpipes and external sheathing.

4.3 CONCRETE ROOFING TILES

Brand/type: ~

Flashings: ~

Pointing material: ~

Fixing type/finish: ~/ ~

A flexible pointing compound (Flexipoint) is available. Refer to BRANZ Appraisal 335. Amend this clause to suit clay tiles.

*Fixing type: Nails (only for 50mm battens)
Screws (all batten sizes) (stainless only)
Clips (some tile systems use proprietary clips)*

*Exposure Zone Tile fixing finish
B, C Hot-dip galvanised or stainless steel
D, E Stainless steel*

Also use stainless steel for any micro copper timber batten treatments.

4.4 METAL FLASHINGS

Location	Material/thickness	Base metal thickness	Finish
~	~	~	~

4.5 METAL COVERS AND TRIMS

Location	Material/thickness	Base metal thickness	Finish
~	~	~	~