SECTION 1
INTRODUCTION

FOREWORD

This manual has been prepared by CSR Roofing to assist the architect, builder and installer to specify, prepare and install roof tiles. While it is not possible to detail every condition that may be encountered, CSR Roofing will assist to advise on any special situations that may occur.

This manual has been written as a working guide for industry, however it is not intended to replace good trade practice and experience essential to obtaining a quality roof installation. Nor does this manual override specific advice received from CSR Roofing fixing services.

Architects and specifiers should ensure that the details provided in this manual are followed, and determine to their own satisfaction that the job is complete to an acceptable standard of trade practice.

INTRODUCTION

IMPORTANT

All care has been taken in the compilation of this manual. However, CSR Roofing accepts no responsibility or liability for the contents of the manual (including any printing or typographical errors) and recommends that all standards and recommendations are independently checked.

Note: The instructions and details in this manual refer to both concrete and terracotta tiles (except where specifically noted).

SPECIFICATIONS

While information contained in this manual is correct at the time of creation, specifications are subject to change without notice.

LOCAL AUTHORITIES

Installation standards and product specifications contained in this manual are minimum recommendations based on both Australian and New Zealand Standards and good trade practice. As environmental conditions vary by region, the appropriate fixing standard for specific regions will also vary. Therefore, where applicable, the local CSR Roofing fixing office should be consulted.

It is also recommended that other local authorities be consulted.

PERFORMANCE

CSR roof tiles will perform as specified if installed in accordance with good trade practice and the recommendations set down in this and other relevant literature.

Tile installation specifications should be applied in conjunction with, state regulations and Australian and New Zealand Standards.

The objective of these specifications is to provide up-to-date information for architects, building contractors and all persons responsible for purchasing and installing roof tiles.

This manual covers the range of CSR roof tiles and accessories available in Australia and New Zealand and the preferred methods and standards for fixing tiles.

The following points should be considered:

- The need to encourage the highest standards of trade practice to ensure long lasting and attractive roof finishes
- The need to encourage compatibility between overlapping trades on building sites
- The full range of products may not be available or applicable to all states at this time
- Uniform installation methods are given, but as there are some variations in procedure from state to state. Advice should be obtained locally
- Special installation standards apply to designated high wind areas.

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GLOSSARY

Abutment
Where the roof tiles meet a structure rising above the roof.

Accessory
A concrete or terracotta product used to finish the roof; includes apex, ridge and barge tiles.

"A" frame roof
A steep pitched gable roof, each slope extending from close to the ground line to meet at the ridge.

Anti-ponding board
A sarking or underlay-support of various materials, (galvanised iron, fibrous cement etc), installed along the eaves lines from the top of the fascia back to the rafter with a clearance of 10 mm below the first batten. This prevents water "ponding" behind the fascia. Anti-ponding boards should be installed on all low pitched roofs or roofs with no overhang.

Apex
The intersection of all ascending hips where they meet either a ridge or another ascending hip. Note: Also the name of a three or four-way fitting used to cover this point.

Apron flashing
A one-piece flashing, such as is used at the lower side of a chimney that penetrates a sloping roof.

Barge board/verge board/gable board
A sloping board installed to the pitched edges of a gable, covering the ends of roof timbers.

Barge course/Verge course
The tiles next to the gable.

Bastard valley
A valley or hip formed by the intersection of two roof planes at different pitches.

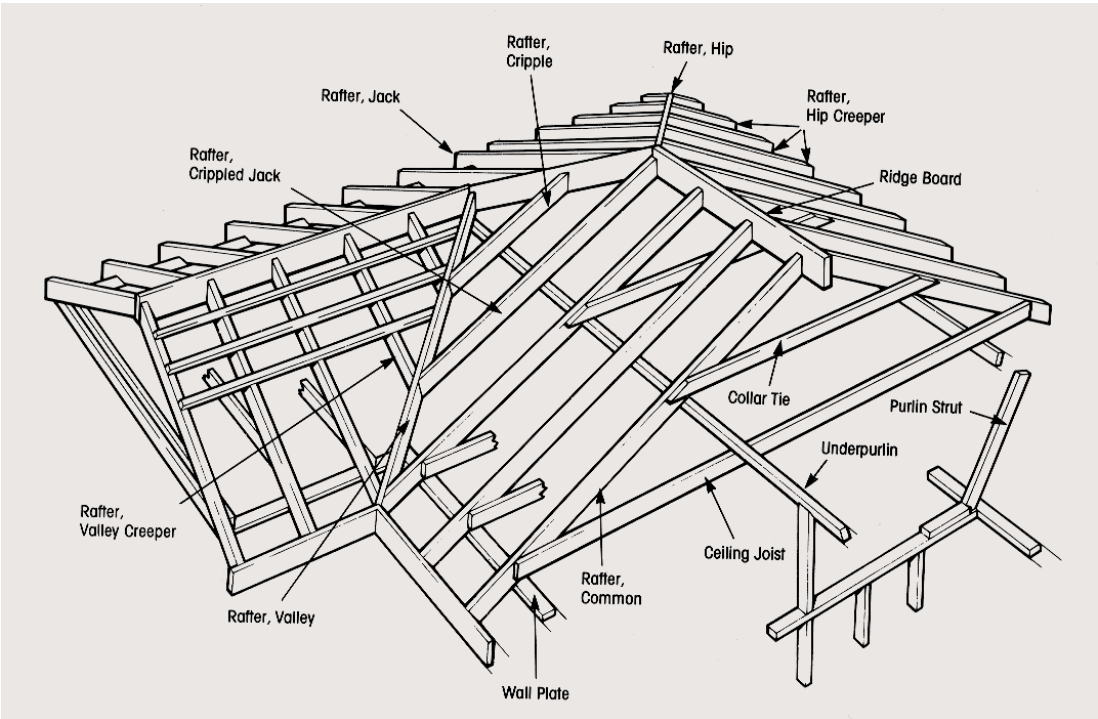
Battens
A specifically sized timber or steel section installed parallel to the eave line on which tiles are fixed.

Bedding
A composition of brick layers' sand and cement for fixing ridge capping on hips and ridges. The edges are finished off with a pointing material.

Bellcast batten: (Tilting batten)
A batten installed on the toe of the rafters in a vertical line with the plum cut, to keep the eaves course of tiles on the same rake as the other courses. (The fascia board usually serves this purpose).

Bond
The system of aligning tiles on the roof in relationship to each other. With a straight bond, the sides of tiles form straight lines from bottom to top course. With a staggered, broken or cross bond, tiles in each alternate course overlap, by half, the tiles above and below them.

ROOF STRUCTURAL MEMBERS



Box gutter
An internal roof gutter, into which, two adjoining roof planes discharge water in opposing directions, or a single roof plane discharging water against a wall, parapet or chimney. Usually but not always discharges into a sump.

Capillary break
A groove or space left between two surfaces, large enough to prevent capillary movement of water into a building.

Ceiling joists
The joists that carry the ceiling and also form a tie between the feet of the common rafters.

Cleat
A small piece of wood that reinforces another, or is used to locate positively another timber.

Clipping batten
A batten installed to the rafters directly behind the fascia. The clipping batten is used for installing the bottom course of tiles when sarking is not specified. Generally it is only used on homes with metal fascias, and only in high wind areas.

Collar tie
The timber used to connect two rafters at or near their centres.

Concealed gable flashing
Is a flashing made from galvanised steel or similar product.

Counter battens
A batten normally installed on top of and parallel to the rafters over the ceiling lining, where the ceiling lining is fixed on top of the rafters (exposed beams). Tiling battens are then installed to the counter battens, creating an air space that allows sarking to dish between the rafters.

Dormer or dormer window
A vertical window or opening, coming through a sloping roof, usually provided with its own-pitched roof.

Dormer cheek
The upright side to a dormer.

Dutch Gable
A gable where the ridge terminates before the edge of the roof connected by a hip running to the corner of the roof.

Eaves
The lowest overhanging part of a sloping roof that projects beyond the external wall.

Eaves fascia
A board on edge installed along the feet of the rafters. It often carries the eaves gutter along the eaves.

Eaves overhang
The inclined distance (line of rafter) from the outside of the external wall to the inner face of the fascia.

Eaves width
The horizontal distance from the inner face of the fascia board to the outside of the external wall.

Edge of roof
The area of a roof bounded by the eaves, ridge and barge, extending towards the centre of the roof for a distance equal to 0.1 multiplied by the minimum plan dimension of the building, measured from eaves to eaves, or barge to barge.

Façade
The face or front of a building.

Fall
The slope or pitch of a roof or gutter.

Fascia board
A wide board set vertically on edge and fixed to the rafter ends or wall, which caries the gutter.

Flapping
A noise caused by wind passing over a tile roof making sarking flap against the underside of the batten and tile. Anti-flap pads can be used to overcome this problem.

Flexible pointing
A highly pliable yet durable compound which, once cured, forms an incredibly strong bond between the tile and ridge capping.

Glaze
A "frit" (glaze) fired onto the surface of terracotta tiles to provide various colours.

Gutter
Any form of roof water channel, eg:
Back Gutter: a gutter at the back of a chimney or other penetration in a pitched roof.
Box Gutter: a gutter with parallel sides, usually between two opposing roof slopes.
Concealed Gutter (Secret Gutter): a gutter formed at a valley or against an abutment and concealed by the tiles and flashing.
Eaves Gutter: a gutter fixed at the eaves.
Valley Gutter: a gutter at the internal junction of two roof slopes.

High wind area
Areas in which the basic design and wind velocity, modified for terrain and height in accordance with AS 1170.2, has a wind classification N3/C1 or greater. In NZ this is defined as an area where wind speed exceeds 44m/sec in accordance with NZS 3604:1992 Section 5.

Hip end Tile
A sloping triangular roof fitting designed to cover the end of a hipped roof.

Hipped roof (End)
A gable roof which has two additional sloping planes at either end of the roof.

Lap
Head or End lap: the distance by which one course of tiles overlaps the course below.
Side lap: the distance by which one tile interlocks with the tile beside it.

Lifts
Roofing trade term for stacks of tiles around the roofs.

Loading
he installing requirements and materials for sarking, battens, tiles and accessories etc, specified by the tiling manufacturer as sufficient to withstand the loading requirements of AS 1170.0 and AS 1170.0 Suppl 1:2000.

Mansard Roof
A roof structure with two pitches. The steep pitch commences at the eaves, and intersects with the lower pitch, which finishes at the ridge. Tiles on the lower pitch overhang the steeper pitch by a slight margin.

Mitred hips/valleys
Cut tiles on hips or valleys that form a true and straight line where the cut tiles join on each slope.

Mortar
See "Bedding".

Mottle
Used to describe the laying of various coloured tiles at a consistent percentage throughout the roof.

Nogging
Short pieces of timber nailed between studs in a wall to brace the structure.

Parapet wall
Usually a brick or timber structure that rises above the roof line.

Picking up
The term used when the tiler is trowelling off any excess mortar that may overhang the ridge capping after bedding.

Pitch
The angle or slope of the roof surface to the horizontal expressed either in degrees or as a ratio, eg 15° or 1:3.75.

Profile
The shape and design of the tile.

Rafter
A sloping member that extends from the eaves to the ridge of a roof to support roofing material.
Common rafter: the main support rafter of the slope between eaves, wall plate and ridge.
Cripple Creeper rafter: the rafter connecting a hip and valley.
Crippled jack or Broken Hip rafter: a rafter connecting the end of a ridge to a valley.
Hip rafter: a rafter following the line of the intersection of two roof planes.
Hip creeper rafter: a rafter connecting a wall top plate and hip.
Jack or Crown End rafter: a rafter installed at the end of a ridge and the meeting point of two hips.
Principal rafter: an upper member in a truss that has the same inclination as the common rafters.
Valley rafter: a rafter following the line of the internal intersection of two roof surfaces.
Valley creeper rafter: a rafter connecting ridge and valley.

Rake
The roofs angle of inclination from the horizontal.

Ridge
The horizontal line where two planes of a roof meet together.

Ridge board
The horizontal board, set on edge, at which the rafters meet.

Ridge capping
A roof fitting used to cover the ridge-line that can be either 'V' shaped or arched (rounded). This generally consists of a specifically made tile used for both the ridge and hips of a roof.

Rigid pointing
A mixture of clean sand, cement and oxide colouring or pre-mixed flexible material, used for the completion of joints between ridge or hips and with roof tiles or tiles at gable ends.

Roof
A covering to protect a building from the elements.

Roof tile
A concrete or terracotta product used to cover the field of the roof.

Sarking/Underlay and Underlay/Sarking
A reflective, pliable membrane that is installed under the tile battens and conforms to AS/NZS 4200.1. (Underlay is not reflective in New Zealand and has an absorbency rating of 100g/m2)

Sawtooth roof
A roof structure that is vertical on one side with a slope down from the ridge line on the other.

Secret gutter
A gutter usually fixed against a wall adjoining the roof slopes, concealed by the roof covering and vertical wall flashing, then spilling into an eaves gutter.

Scribe board
A type of bargeboard shaped to match the overhanging profile formed by the under surface of roof tiles that overhang a gable end. The tiles are pointed up on the interlocking joints.

Skillion
The term for a pitched roof with one plane.

Skylight
A glazed window or translucent roof section fitted parallel to the roof slope to admit light.

Sheathing
A close boarding or other material nailed to the framework of a wall or roof. Sometimes referred to as sheeting.

Soaker
A concealed flashing under tiles, mitred hips and parapet walls shaped and installed to allow water to discharge on the tiles of the course below.

Soffit
The lining installed under the eaves between the fascia board and external wall.

Soffit bearer
Timber or metal used to support the soffit.

Stormseal
A bitumen impregnated foam strip used to weatherproof areas of roof to prevent water penetration during storms, can be flexible pointed.

Staggered bond
The method of laying tiles where the vertical joint of every tile is laid to overlap with a half bond of the tiles in the course below.

Starter/Shell end
The first hip cap at the lowest point of the hip line.

Straight bond
Where tiles are not staggered but are laid directly on top of the tile in the course below, so that the vertical joints form one straight line up the slope of the roof.

Steel battens
Steel battens must be designed in accordance with, AS 2050.2002, 2.2 and manufactured from metallic coated steel with a minimum coating class of Z275 or in accordance with AS 1397. In corrosive areas, advice should be sought from the manufacturer.

Stud
A vertical wall support.

Tile clip
A specially formed metal fastening used to secure tiles to supporting members.

Tilting batten
Serves the same purpose as a bellcast batten.

Top plate
The horizontal member above a wall on which the truss or rafter sits.

Truss roofs
A roof supported by self-supporting, triangulated structural framework which is, usually prefabricated and delivered to the job site. This type of construction is commonly used for all types of roofs.

Under purlin
A horizontal member in a roof at right angles to the principal rafters or trusses. It carries the common rafters.

Underlay/Sarking and Sarking/Underlay
A reflective, pliable membrane that is installed under the tile battens and conforms to AS/NZS 4200.1. (Underlay is not reflective in New Zealand and has an absorbency rating of 100g/m2)

Upright work
Tiling carried out on a roof pitched close to vertical, normally on a façade or a mansard roof.

Valley
The internal angle formed by the meeting of two sloping surfaces of a roof; the opposite of a hip. A valley tray is installed in this area to direct water to the gutter.

Valley Batten
A tiling batten fixed parallel to each side of the valley board. It must be fixed on all valleys when the roof is sarked.

Valley iron/Valley tray
A "V" shaped sheet lipped on each outside edge and formed to fit into the angle of a valley.

Vent
Any pipe or tube protruding through the roof covering, normally circular in shape.

Verge
The edge of a sloping roof which overhangs a gable.

Weephole
A small hole inserted in the ridge bedding and pointing mortar creating a water channel for draining purposes.

Z Flashing
Normally a galvanised strip with an internal lip fixed under the fibre cement verge strip to allow water to run into the gutter.

CSR ROOFING HISTORY

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THE MONIER STORY

In the middle of the 19th century Joseph Monier, a commercial gardener, experimented with wire reinforcement for his concrete flower pots. He perfected his invention, patented it and in 1867 exhibited the result at the Paris Exposition.

His invention was acquired by a German company in 1885 and subsequently developed into an entire system for reinforced concrete in the construction industry known as "Das System Monier", or "Monierbuilt". Although Joseph Monier did not die a rich man, his name became well known throughout Europe.

The name Monier came to Australia in 1901 by way of another German, who established a concrete pipe manufacturing business at Darling Harbour in Sydney using the Monier patent.

The business went though many changes until, in 1936, Cement Linings Ltd was formed and became the foundation of the Monier Company. The company name changed to Monier Limited in 1979, by which time the company had many businesses associated with the building and construction industry, including many concrete tile factories.

The name Monier was first used for concrete tiles in 1948 when factories were established at Villawood in Sydney and Canberra, but over the years its use extended across Australia and New Zealand.

THE WUNDERLICH STORY

Ernest Wunderlich migrated to Australia in 1855 followed shortly after by his two brothers, Alfred and Otto. In those days, the Wunderlich's were importers of pressed metal ceilings. However, in 1892, when a consignment of terracotta roof tiles arrived in Sydney from the south of France and the consignee could not be found, the Wunderlich brothers purchased the consignment. These tiles were called Marseille, after the port from which they were exported.

World War I disrupted the supply of tiles from France, but by this time the Marseille tiles were in great demand. The Wunderlich brothers recognised this as a timely opportunity. They began manufacturing their own version of the tile leading them to build a tile factory in Sydney in 1916, and a tile accessory plant in Melbourne.

By 1957, the Wunderlich Company had clay tile factories throughout Australia and New Zealand, while continuing to manufacture other building products such as their pressed metal ceilings.

In 1969, CSR acquired the Wunderlich clay roof tile manufacturing business. Monier purchased Wunderlich in 1983. Monier in turn was 100% acquired by CSR Ltd in 1994.

Presently, CSR Roofing produces Monier concrete tiles from six plants and Wunderlich terracotta tiles from one plant, servicing the whole of Australia and New Zealand.