



Hawkesbury City Council

Attachment 2
to
item 7

Fact Sheet - Roofs Heritage
Guidelines

date of meeting: 22 July 2021
location: by audio-visual link
time: 5:00 p.m.

HAWKESBURY CITY COUNCIL

FACT SHEET - ROOFS

HERITAGE DEVELOPMENT GUIDELINES

OCP ARCHITECTS
Preliminary Draft – October 2020

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1 ROOFS

1.1 Roofing Materials

The appearance of a building can be significantly influenced by the form, materials, and profile of roofing, including the detailing of eaves, ridgelines, gutters and downpipes.

Objectives

- O1 To ensure that original roofing materials are preserved, where possible.
- O2 To ensure that all changes to roofing is based on an understanding and consideration of the original roofing materials.

Provisions

- P1 Original roofing materials on heritage items or buildings in heritage conservation areas are to be retained.
- P2 New roofing materials are to match the original materials as closely as possible, in terms of the materials, colours, finishes, profiles and sizes. Where contemporary materials are proposed, these are to be compatible with the period or architectural style of the building.
- P3 Where an application is proposed for re-roofing of a building, the applicant may be required to provide for the re-instatement of any original details such as verandah or balcony roofs, ridge capping, rainwater goods, etc.

Avoid

Avoid inadvertent loss of original roof fabric details when re-roofing, such as vents, gablets, cappings and ridge decorations such as acroteria.

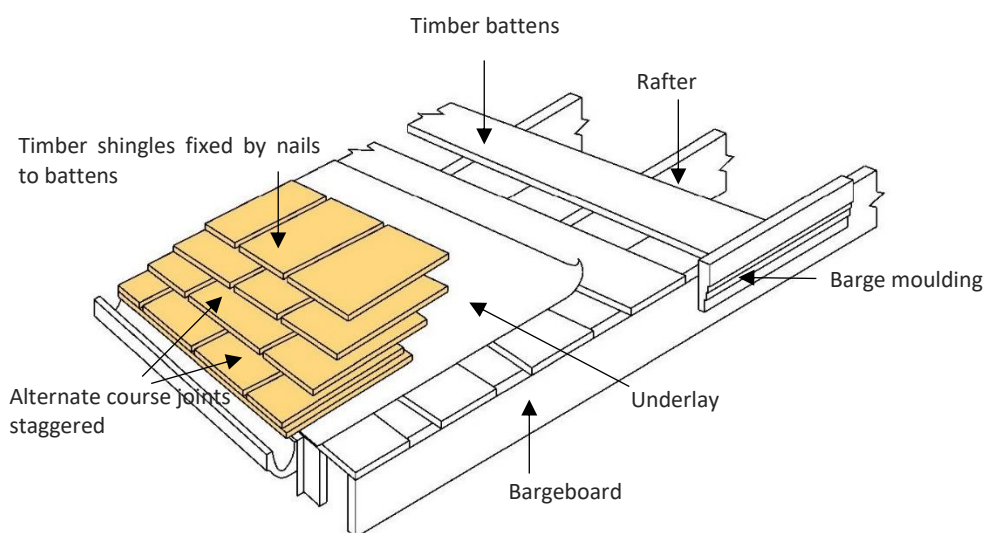
Timber Shingles

The use of timber for roofing in the form of timber shingles dates from the early settlement period and continued up until the late-nineteenth century due to the availability and cost-effectiveness of using local timber as a building material. The presence of timber shingles is increasingly rare. Where they still exist, timber shingles are more likely to be found at the rear of a building, a rear wing, the roof of a barn or other rural outbuilding, or under later roof finishes.

- P4 Timber shingles are rare and should be retained and preserved where possible. Seek advice from a heritage specialist or Council's Heritage advisor for advice on the retention and conservation of timber shingles.
- P5 Evidence of timber shingles within roof spaces, under the existing roof or under verandah roofs, should be maintained.
- P6 Replacement timber shingles should match the colour, size, texture, and timber species of the original shingles.
- P7 Timber shingles were usually fixed down with square cut roofing nails. These are available again from specialist woodworking centres.



Example of a timber shingle roof, Arms of Australia Inn, Emu Plains



Timber shingle roof construction

Metal Roof Tiles

The use of iron tiles for roofing dates from the c1840s in Australia but was quickly supplanted by the use of corrugated iron. Metal tile roofs were often fitted over earlier shingle roofs, or the shingles

were stripped and the battens left to support the metal roof. One form of iron tiles were made by English firm 'Morewood and Rogers'. These tiles are often 600mm x 900mm or 450mm x 900mm and are stamped on the underside with the company name. Local copies fabricated from galvanised iron also appear to have been made. The presence of cast iron roof tiles are rare and are more likely to be found at the rear of a building, a rear wing, the roof of a barn or other rural outbuilding.

- P8 Metal roof tiles are rare and should be retained and preserved, where possible. Seek advice from a heritage specialist or Council's Heritage advisor for advice on the retention and conservation of metal tiles.



Example of 'Morewood and Rogers' roofing tiles at Woodford Academy at Woodford NSW

Corrugated Metal Roofing

When describing roofs, the term 'corrugated iron' is often used to describe two different materials: galvanised wrought iron and galvanised steel. The common feature of these roofs is the corrugated profile, known as 'custom orb'.

The use of galvanised corrugated iron in Australia dates from as early as the 1830s and was widely used in Australia from the 1850s up until the early twentieth century when improved methods of steel making and processing, and the establishment of Australian suppliers, lead to the complete replacement of wrought iron with mild steel.

The use of corrugated metal as a roofing material continued in Australia up until the present with the production of Zinalume and Colorbond products from the mid-1960s onwards. However, these modern corrugated metal sheets differ from earlier corrugated iron and steel roofs in their material composition, surface finish and colour and can often lead to issues when used to replace earlier roof materials due to bi-metallic corrosion caused by the combined use of incompatible metals.

- P9 All original/early corrugated iron and corrugated steel roofs are to be retained.
- P10 Where original/early corrugated iron roofs are damaged or deteriorated, seek advice from a heritage specialist or contact Council's heritage Advisor.

- P11 Where corrugated steel roofing requires replacement or repairs, replace with galvanised corrugated steel to match the existing profile (i.e. corrugation). Early corrugated roof sheeting was manufactured in short lengths, creating a pattern of end laps, so when replacing these shorter roofing sheets, the shorter lengths should be replicated.
- P12 Do not replace corrugated iron or corrugated steel roofs, or any associated roof elements such as ridge capping, gutters or downpipes with Colorbond colours or Zinalume. Zinalume is an incompatible metal with earlier roofing materials such as corrugated iron and lead, and will result in corrosion. Galvanised steel sheets should be used.
- P13 Where possible, undertake repairs to corrugated metal roofs by replacing individual roof sheets with matching sheets rather than re-roofing.

Leadwork

Lead is a highly durable material traditionally used for roof elements such as flashings and box gutters.

- P14 All original/ early leadwork should be retained and preserved.
- P15 Where lead roof elements are deteriorated and require replacement, these elements must be replaced with lead. Leadwork should not be replaced with other materials.
- P16 Where a building retains original or early leadwork, ensure that materials used for other building elements including roof sheeting, gutters and downpipes are comprised of compatible metals.
- P17 Because of the dangers of lead poisoning, it is not recommended to collect rainwater for human consumption from a roof with lead flashing. Pure zinc may be used in lieu of lead. Water filters may be used, but advice should be sought as to the best sort of water filter to be used and their adequacy filtering lead. Seek advice from Council's Heritage Officer or NSW Department of Health.

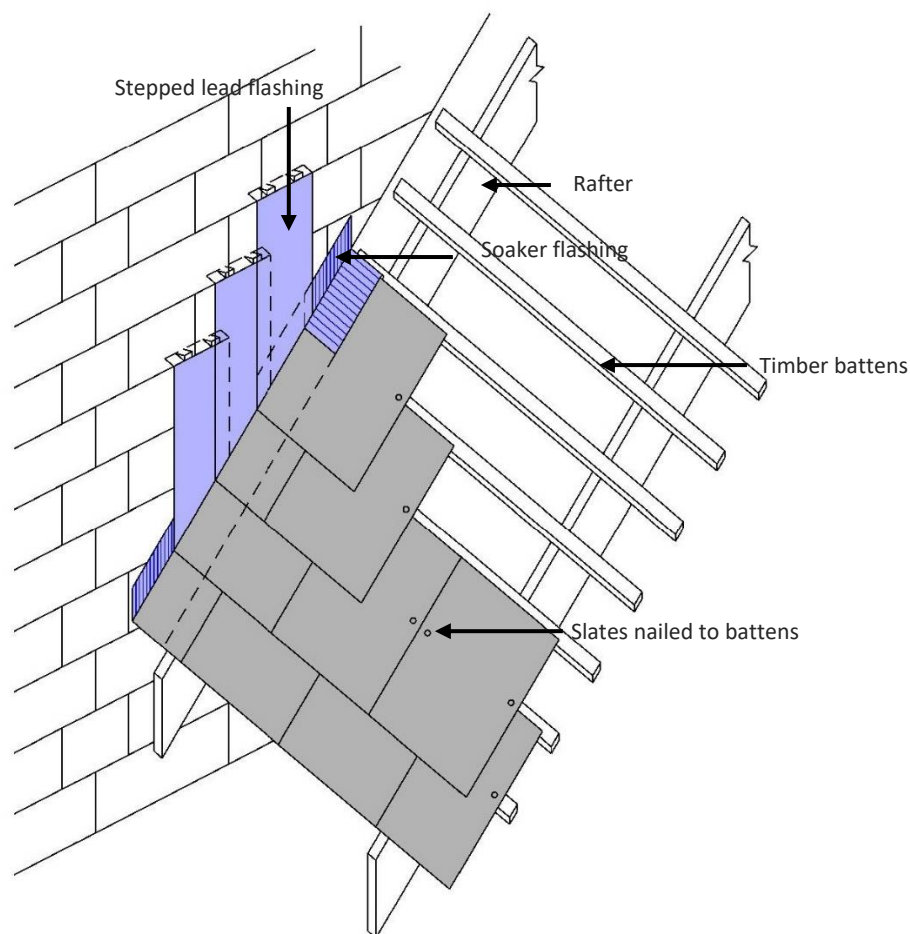
Slate

European and British slates have been used in Australia since the 1830s and from the 1840s, slate from South Australia was exported to New South Wales and Victoria. In the latter part of the nineteenth century, slate of different shapes and colours were used to create patterns. Slate roofs were sometimes enriched with cast iron cresting or terracotta tiles along the ridge. These details, where they exist, should be carefully preserved.

Flat plain unglazed terracotta tiles were also available around the turn of the century.

- P18 Original/ early slate roofs should be retained and preserved, including all associated ridge detailing and leadwork.
- P19 Where existing slates are in poor condition, replace slates with new or recycled slates. Ensure that the new slates are the same type of slates (e.g. British slates, South Australian slates) and are the same size, profile, colour, etc.

- P20 Where select areas of slates require repair or replacement, relocate slates from less visible roof planes to more visible areas to avoid single mismatching slates or patches and then re-tile remainder of roof with new or recycled slates to match the existing original slates as closely as possible.
- P21 Slates were nailed to timber battens with metal slating clouts, through holes drilled or punched through the slate. Nails were either galvanised iron or copper. There were two methods of nailing; head nailing and centre nailing. When repairing or replacing slates the original method of fixing should be replicated.

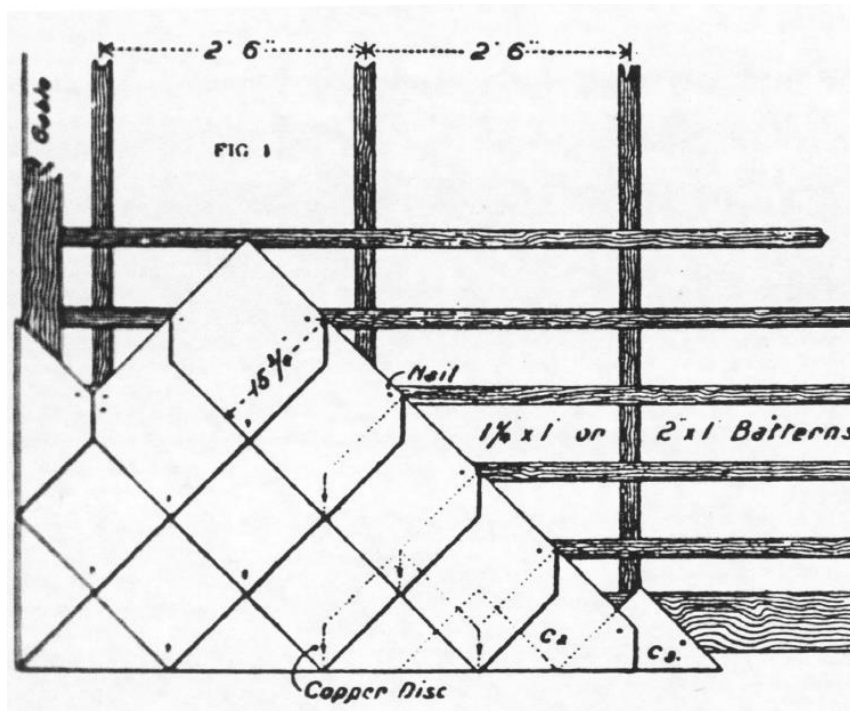


Slate roof construction

Asbestos Slate

Compressed fibrous cement products, including asbestos slates, were introduced to Australia in the early 20th Century. Asbestos slates came in a range of sizes and colours, designed to copy slate and shingle roofs. By 1907, Hardies were selling patent asbestos cement slates in purple, blue, red and

grey of various sizes and thicknesses, with mouldings, ridge and hip pieces, coverings, and special shaped tiles for ornamentation.



Asbestos cement slate construction

Source: C E Mayes, The Australian Builders & Contractors' Price Book [8th ed, Sydney 1914]

- P22 Where asbestos slates (or any other associated roof features) are damaged or in poor condition, replace with similar materials (without asbestos) to match the colour, profile and texture of fibre cement slates.
- P23 Ensure that all works are undertaken by suitably qualified contractors and that all building materials containing asbestos are disposed of safely.

Terracotta Tiles

Marseille patterned tiles, originally made in France, were introduced to Australia in the 1890s and were common in many suburban areas. Originally from France, these unglazed tiles were used extensively on Federation and Queen Anne style houses as well as on Californian bungalows. Tiles imported from France were eventually replaced with locally manufactured tiles from the 1920s.

Flat plain unglazed terracotta tiles were also available at the turn of the century; however, their use was less widespread. Tiles were traditionally fixed down by locating the lugs on the underside of the tile over the timber batten, and then securing the tile with copper wire. Modern terracotta tiles are available with a glazed finish, which provides greater waterproofing capabilities, and provides a wider range of finished colours.



Marseilles pattern terracotta roof tiles

- P24 Terracotta tiled roofs should not be replaced with concrete roof tiles.
- P25 Where select areas of tiles require repair or replacement, relocate tiles from less visible roof planes to more visible areas to avoid single mismatching tiles or patches and then re-tile remainder of roof with new or recycled tiles to match existing.
- P26 Replacement tiles should match as closely as possible to the original terracotta tiles. It is important to obtain tiles with the correct level of glazing. Modern terracotta tiles are often highly glazed and are therefore not a suitable match to earlier unglazed or semi-glazed terracotta tiles.
- P27 Decorative terracotta ridge elements such as ridge tiles and finials should be retained and preserved.

Concrete Tiles

Concrete roof tiles were mass produced in Australia after the Second World War and became particularly popular from the 1970s onwards. Concrete roof tiles from small local manufacturers may have been available earlier in the 20th Century, however, these are less common.

Modern concrete roof tiles are manufactured from a mixture of sand and cement and are spray coated to improve their appearance.

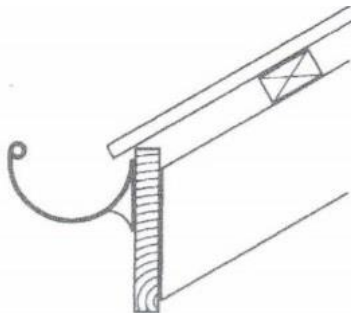
- P28 Where concrete roof tiles have replaced an earlier roofing material (such as terracotta tiles, slate, corrugated iron, etc.), the earlier roofing material should be re-instated.
- P29 Where used as the original roofing material, concrete roof tiles should be retained or replaced to match existing.

2 ROOF DRAINAGE

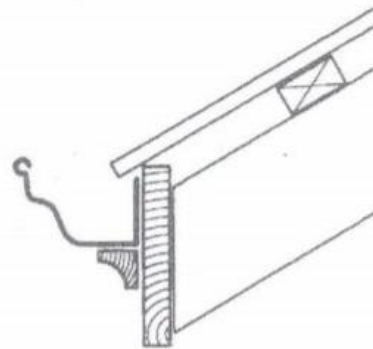
As well as playing an important functional role, roof drainage elements such as gutters, downpipes, flashings, rainwater heads and drainage grates contribute to the overall character of historic buildings and also play an important functional role.

When replacing or re-instating gutters and downpipes, the original profiles, shapes and materials should be used. Evidence of the original profiles may be obtained from original building plans or specifications, early photographs or physical remnants on site. For example, remaining brackets or the paint shadow of the original profile of a gutter hidden behind existing guttering where it abuts a fascia.

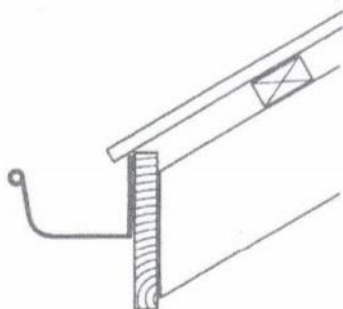
Generally, buildings constructed in the colonial period featured half round gutters; buildings constructed during the Victorian and Edwardian periods featured Ogee profile gutters; and modern buildings constructed from the First World War onwards featured quad or “D” shaped gutters. Buildings with parapets feature box gutters.



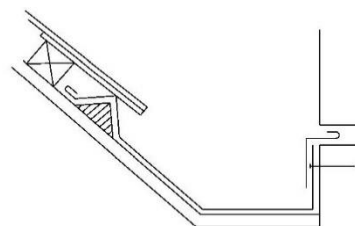
Half round gutter



Ogee gutter



Quadrant or “D” gutter



Box gutter

Objectives

- O1 To ensure that water is drained effectively from roofs.
- O2 To maintain and conserve early roof drainage elements which contribute to the historic character of a building.

Provisions

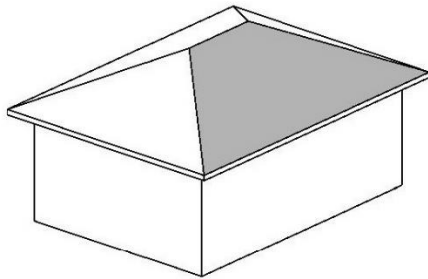
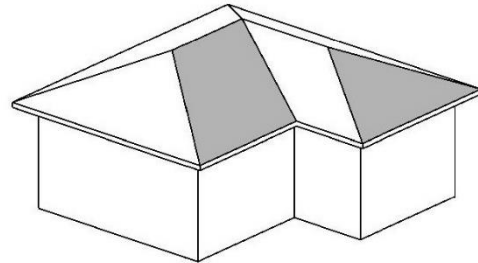
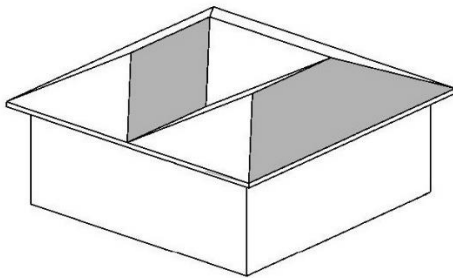
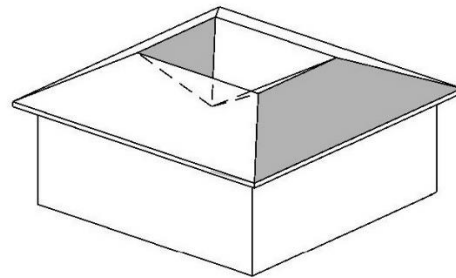
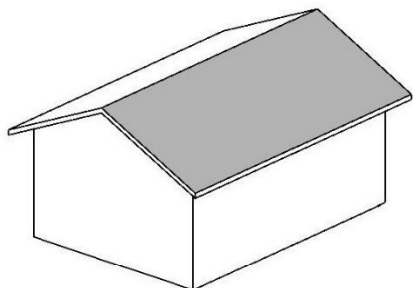
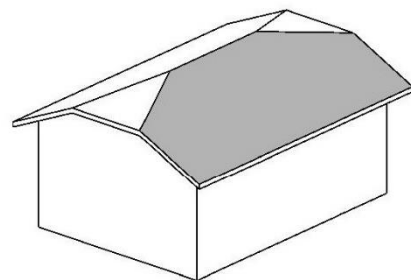
- P1 Retain all original roof drainage elements such as gutters, downpipes, rainwater heads, astragals and drainage grates at the base of downpipes.
- P2 Ensure in-ground drainage is sufficient to carry the water away from the building and to the stormwater system. Inadequate stormwater drainage, or damaged or blocked drainage systems may result in serious damage to walls and foundations.
- P3 Retain all leadwork and cast iron elements such as downpipes.
- P4 Where roof drainage elements such as gutters and downpipes require replacement, new elements are to match original details in terms of their size, materials and profile.
- P5 In some circumstances the original size of gutters, gutter overflows and downpipes, including the number of downpipes, may not be sufficient to drain roofs adequately, as design standards have been revised in later times. Advice should be sought from Council's Heritage Officer, so that gutters, overflows and downpipe sizes can be upgraded so as to minimise impacts on heritage significance.
- P6 Ensure that the roof drainage elements are compatible with other metal elements of the roof (i.e. roof sheeting, flashings, etc). (Note: Zinalume is not compatible with earlier metal roofing materials such as cast iron or lead).
- P7 Do not replace cast iron, copper or steel roof drainage elements with Zinalume, Colorbond or PVC.
- P8 Where the opportunity arises, replace unsympathetic roof drainage elements, such as PVC or unsympathetic metal downpipes or unsympathetic gutters with elements of the correct profile and materials.
- P9 Downpipes should be painted to match the background wall colour. Minimise the exposed section of PVC pipe which connects to the stormwater system at ground level. Paint exposed section to match the downpipe.

Avoid

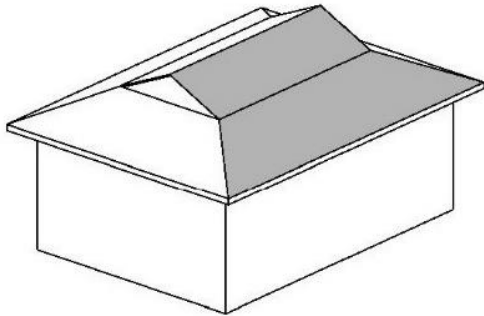
- Using rectangular downpipes in domestic situations, rather than round.
- Discharging higher levels gutters onto lower gutters which may result in overloading these gutters.
- Using a large modern flashing to seal the top of a verandah to a wall.
- Cutting flashings into walls instead of using the existing masonry joints.

3 ROOF PROFILES AND FORM

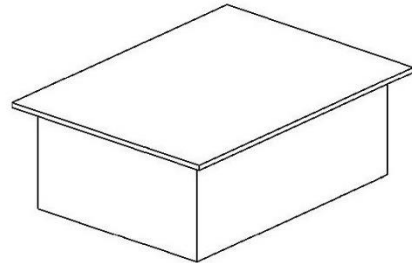
The roof form of a building is often the most prominent feature, especially within the wider townscape. The profile and form of a roof significantly influences the form and overall appearance of a building as well as the character of the townscape. The diagrams below provide an outline of common types of roofs.

Common Roof Types**Hipped Roof****Multiple Hipped Roof****Double Hipped Roof****"Well" Hipped Roof****Gabled Roof****Dutch Gabled Roof**

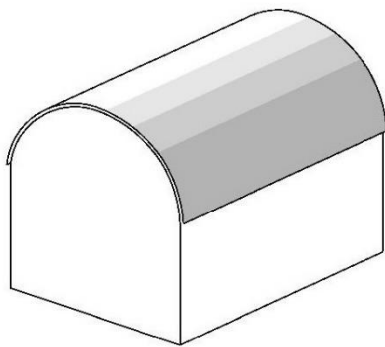
Common Roof Types



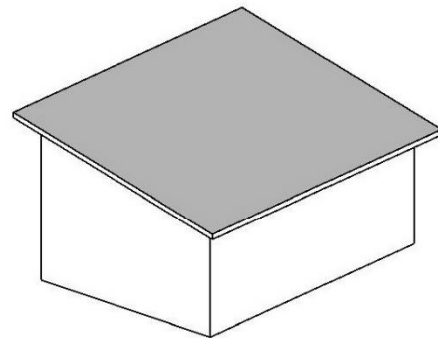
Gambrel Roof



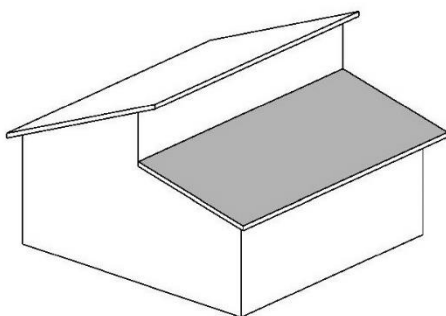
Flat Roof



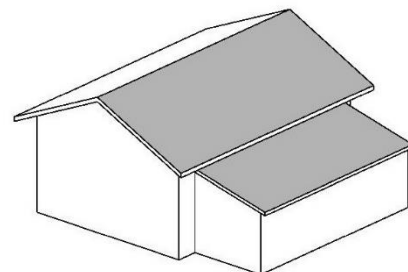
Barrel Vaulted Roof



Skillion Roof



Double Skillion Roof



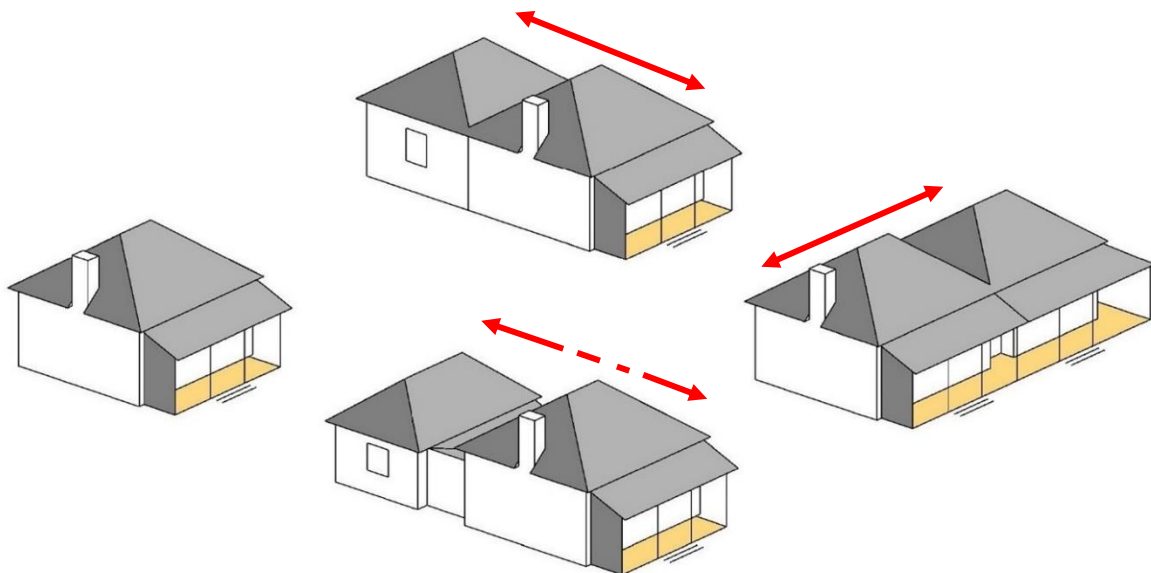
Lean-to Roof

Objectives

- O1 To maintain significant roof forms and shapes that are integral to the design of a building. Including roof pitch, ridge height and eaves height.
- O2 To ensure that any modifications to roofs of historic buildings respect and enhance the original roof form and detailing.

Provisions

- P1 The original roof form of historic buildings should be retained and conserved. New work to a historic building should not obscure the original roof form, or any original roof features of a building.
- P2 Roof forms of additions should relate sympathetically and subordinately to the original roof in shape, pitch, proportion and materials.
- P3 Any roof extensions are to be lower than the original roof.
- P4 Where roofs of historic buildings are extended, there should be clear differentiation between original and new sections of roof.
- P5 New buildings are to have roofs that reflect the size, mass, shape, pitch of the neighbouring original roofs.
- P6 Eaves with exposed rafters should not be enclosed (exposed rafters are a typical characteristic of Federation buildings and some Californian Bungalows).



Suitable ways of extending an original building by not disturbing the original roof form and profile

4 ROOF FEATURES

Roof features such as chimneys and other decorative elements are often essential to the design of heritage buildings which provide articulation of the roof form and contribute to a distinctive skyline within a suburb or streetscape.

Roof features can often provide a means of elaborate architectural expression reflecting the stylistic influences of the time.

Decorative timberwork on verandahs or gables such as finials, bargeboards and vents are an integral part of the distinctive character of early 20th Century buildings.

Objectives

- O1 To ensure that all roof features such as chimneys, roof vents, gable detailing, decorative timberwork, parapet detailing and eaves and fascias of historic buildings are retained, preserved and where possible, reconstructed.

Provisions

Chimneys

- P1 All chimneys are to be retained internally and externally. Chimneys should be repaired and maintained even when the fireplace is not in use. Any internal features including fireplaces, tiles and mantles should be preserved.
- P2 Chimneys should not be demolished. If chimneys are structurally unsound, seek advice from a specialist structural engineer and heritage specialist for suitable stabilisation, repairs, restoration or re-construction works. (N.B. Reconstruction should only be explored when all other options for retention have been exhausted).
- P3 Authentic reconstruction of original chimneys is encouraged. This should be based on historic and physical analysis of the original detailing of the building which may be illustrated in architectural plans or shown in historic photographs.
- P4 Face brick or stone chimneys should not be rendered or painted.
- P5 All chimney detailing, including surface finishes, chimney pots etc. should be retained and preserved.

Decorative Elements

- P6 Significant original roof features such as gables, finials, roof vents, decorative timber work and exposed eaves should be retained and conserved.
- P7 Decorative timberwork should be maintained and repaired where necessary. Where external timber elements require replacement, elements should be reconstructed to match the details and materials of original elements.
- P8 Where external timber elements are to be replaced, high quality hardwood timbers are to be used to ensure long-term durability and preservation of heritage significance.

- P9 Authentic reconstruction of decorative roof elements is encouraged. This should be based on historic and physical analysis of the original detailing of the building which may be illustrated in architectural plans or shown in historic photographs.

Parapets

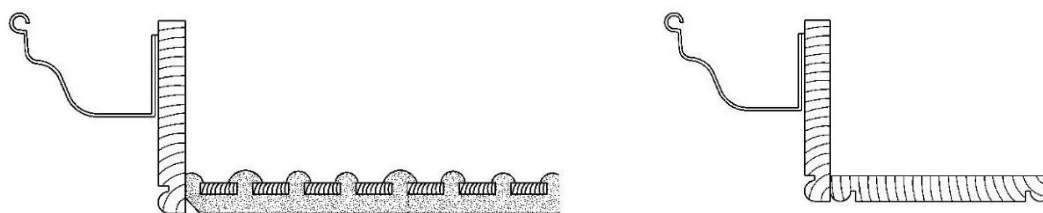
Some roofs, particularly those of commercial buildings, are screened from view by projecting parapets (an extension of the wall at the edge of the roof). Parapets may provide a distinctive silhouette in the skyline and may consist of curved or geometric moulded patterns, or display building dates.

- P10 Decorative features of parapets should be retained and conserved.
- P11 Roof additions are not supported on buildings with front or side parapets where the addition will affect the silhouette of the parapet line.

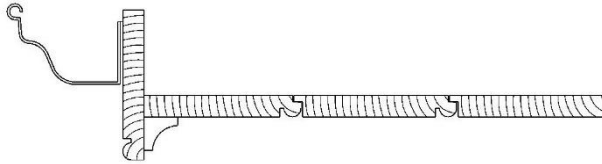
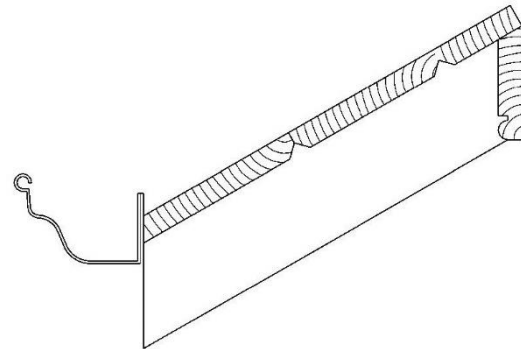
Eaves and Fascias

The eaves and fascias are the part of the roof which project past the wall line, and reflect the distinctive character of the historical period of construction. Colonial houses often had the eaves (or the soffit), lined with plaster, with a timber fascia to support the gutter. In later periods the eaves were lined with timber boards. Eaves and soffits can often be damaged by leaking or blocked gutters and downpipes, and as a result have been altered and repaired over time, often with little regard for historic authenticity.

- P12 Original roof eaves linings and fascias as well as decorative gables boards should be retained and conserved.
- P13 Where roof eaves linings and fascias require replacement, they should be reconstructed to match the details and materials of original elements. This should be based on historic and physical analysis of the original detailing of the building which may be illustrated in architectural plans or shown in historic photographs.



Colonial to mid-19th C eaves

**Mid to late 19th C eaves****Federation and 1920s eaves**

4.2 Changes to Roofs

This section applies to changes to existing roofs. Changes to roofs may include rear roof extensions, dormer windows, or the installation of skylights, solar panels or other equipment. Separate provisions relating to dormer windows, skylights, solar panels and satellite dishes are outlined in 4.2.1 and 4.2.2 below.

Objectives

- O1 To minimise interference to original roof forms and to protect the scale and architectural integrity of existing roof forms.
- O2 Encourage the reinstatement of missing original features based on documentary evidence.
- O3 To ensure that roof extensions and alterations should complement the massing and form of the existing building.
- O4 To ensure that roof extensions and alterations continue the existing historical forms, scale and massing of the streetscape
- O5 In commercial areas the roofs are sympathetic in height, roof form, parapet and silhouettes to the neighbouring buildings in order to maintain compatibility with the existing heritage character.

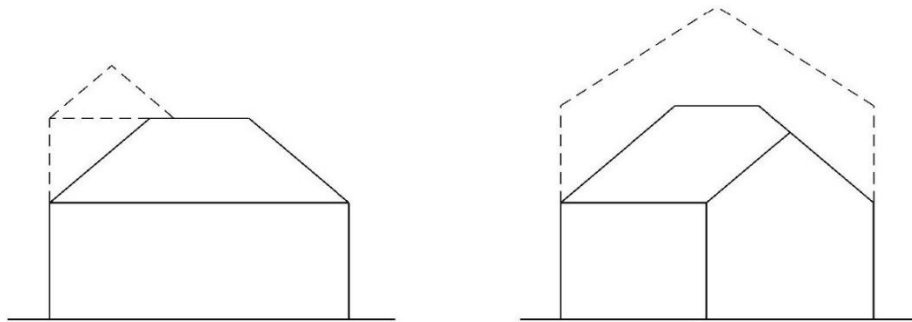
Provisions

- P1 Roof alterations and additions should:
 - a) Complement the details and materials of the original roof;
 - b) Not detract from the architectural integrity of the principal elevation of a heritage item, building in a heritage conservation area, or a group of buildings (i.e. semi-detached dwellings, terraces or row of similar houses);
 - c) Respect the form, pitch, eaves and ridge heights of the original buildings.

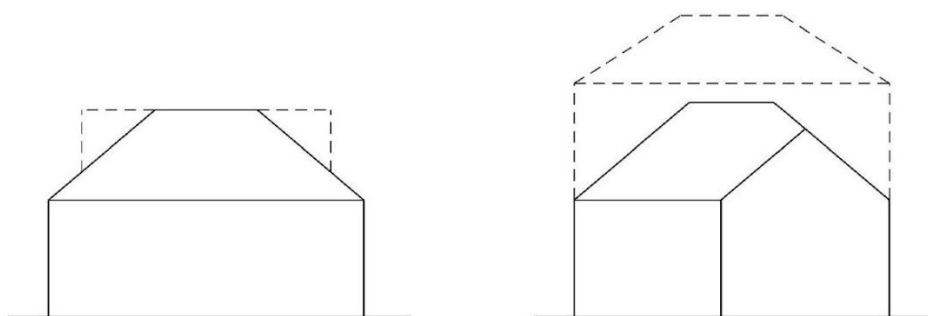
- P2 Roof additions should be set below the ridge line and should allow the original form and detailing of the original roof to be clearly interpreted.
- P3 The existing ridge height should be maintained. The ridge line of a building should not be raised to accommodate a roof addition.
- P4 New roofing materials are to be compatible with the period or style of architecture of the building.

Avoid

- Rear roof addition's which are higher than the existing roof ridge
- Forms that dominate the existing building
- Mansard roofs
- Incorporate gable ends into existing hipped roof forms
- Incorporate dormer windows where there is no historical precedent for them.

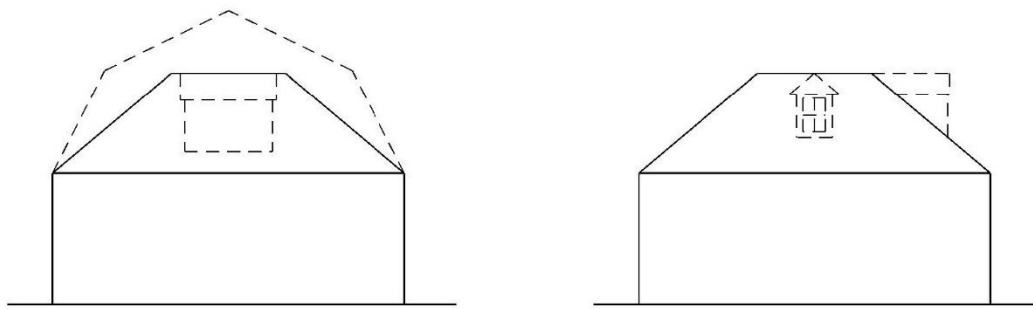


Avoid rear roof additions which are higher than the existing roof ridge



Avoid the addition of gable ends to hipped roofs which change the building form

Avoid additions with roofs that dominate the existing building



Avoid mansard roofs visible from the street, and dormer windows with no historical precedent

Rear Roof Extensions

- P5 Roof extensions to the rear of a building are to be:
- a) Setback from original side walls.
 - b) Set down a minimum of 200mm below the original ridge line.
 - c) Set back from the original rear wall.
- P6 Rear roof extensions should not interrupt repetitive roof patterns in an area.

4.2.1 Dormers

The number, size, proportions, style and architectural detailing of dormers can impact on the heritage significance of heritage items, buildings in conservation areas and streetscapes.

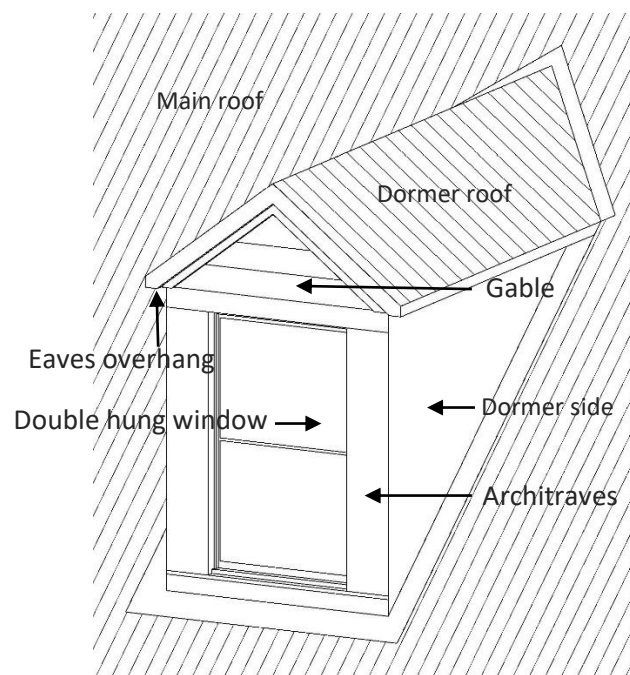
Objectives

- O1 To ensure that dormers do not detrimentally impact on the significance of heritage items and heritage conservation areas.
- O2 To ensure that the location, design, pitch and scale of any dormer is appropriate to the building, roof form, and the character of the area.

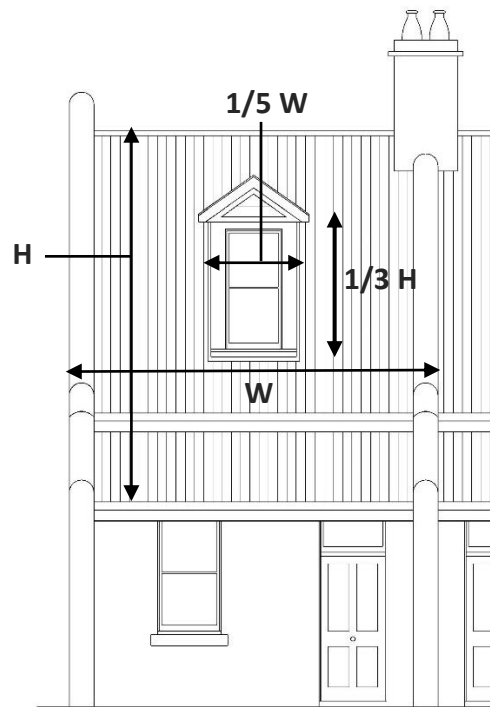
Provisions

- P1 New dormers should not be constructed unless there is historical evidence of a dormer on the building.
- P2 New dormers should not be placed on the street elevation of a building except for in the following circumstances:
 - a) The dormer will not detract from the coherence of the streetscape;
 - b) Surrounding properties have dormers which are visible from the street;
 - c) The dormer will not have any impact on the significance of the heritage item or heritage conservation area.

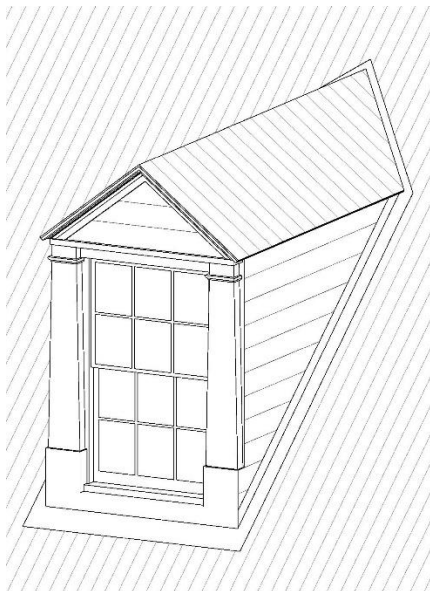
- P2 Dormers will not be permitted if it results in the need to alter the pitch or ridge height of the roof in order to accommodate the dormer.
- P3 New dormers are to be secondary in scale to the roof and should be set back from the eaves and ridge line, and set in from any party walls. Dormers should be no more than one third of the height of the roof plane and should generally be of a size and scale which is geometrically appropriate to the height and width of the roof plane.
- P4 The window sashes which go in the dormer should be in the same proportion as the windows in the rest of the house
- P5 Dormers must not project above any part of the ridge or the roof plane to which the dormer is attached.
- P6 The design of any new dormers is to complement the style and detailing of the existing building and its roof.
- P7 Generally only one dormer is acceptable per roof plane. Multiple dormers are usually not appropriate.



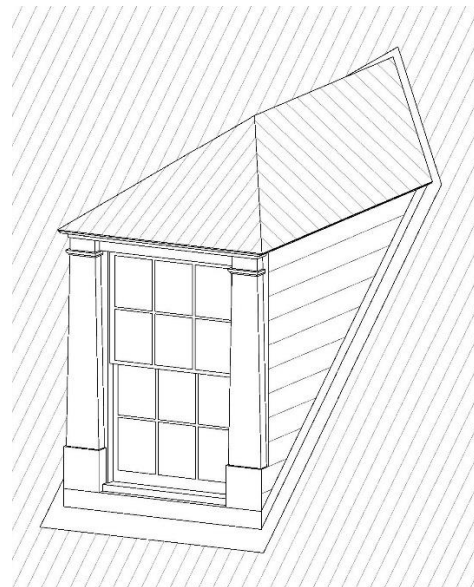
Dormer window construction



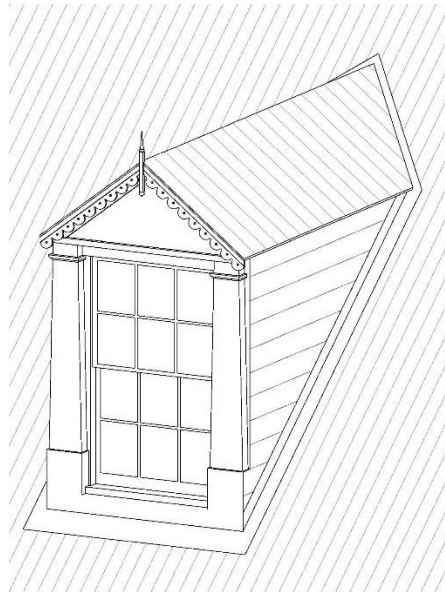
Dormer window proportions



Typical early 19th C dormer



Typical mid-19th C dormer



Typical late-19th C dormer

4.2.2 Skylights, Solar Panels and Satellite Dishes

Structures that are placed on the roof of heritage items or buildings within heritage conservation areas can be intrusive.

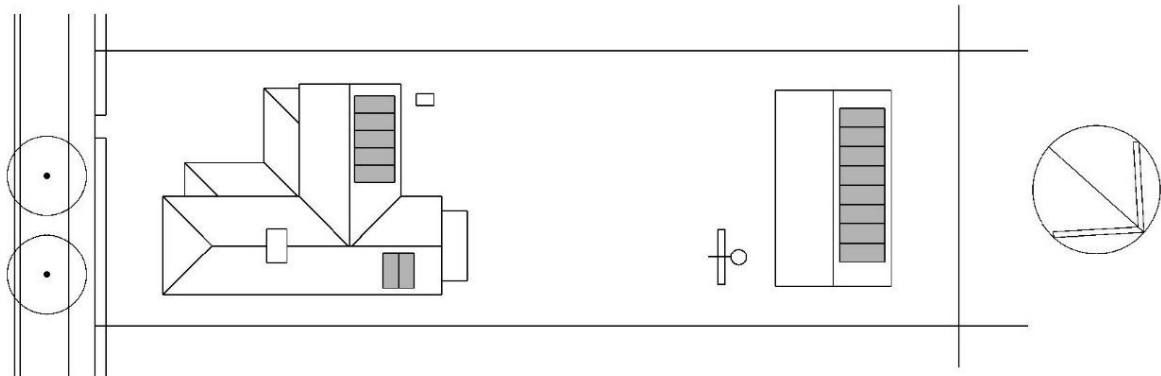
Objectives

- O1 To ensure that skylights, solar panels, satellite dishes and other equipment placed on the roof do not detrimentally impact on the significance of heritage items and heritage conservation areas.

Provisions

- P1 Locate skylights, solar panels, satellite dishes and other roof mounted structures (air conditioning, ventilators, antennae, etc.) away from front elevations and visually prominent roof planes.
- P2 Skylights should be fitted flush to the slope of the roof and should have vertical proportions.
- P3 Skylights should be predominantly glazed with simple unobtrusive detailing. The frame of the skylight should be coloured to merge with the roofing material.
- P4 The installation of satellite dishes and solar panel arrays on roofs of heritage buildings will only be considered where it can be demonstrated that:
- a) There is no other secondary structure which suitable for the equipment;
 - b) There is insufficient space on the property for an independent structure for the solar panels/ satellite dish;
 - c) The installation of the equipment on the roof will not be visible from the public domain or any other significant view, and will not impact on the heritage significance of the building.

- P5 Existing intrusive equipment on roofs, such as antennae and satellite dishes, should be removed or relocated to a more suitable location as the opportunity arises.
- P6 Where site area and solar access allows, locate solar panels mounted on independent structures remote from heritage buildings and screened from view.



Locate solar panels, and other roof mounted structures away from front elevations and visually prominent roof planes.