Sheathing

Shakes and shingles may be applied over spaced sheathing. Spaced sheathing is usually
1 x 4 or 1 x 6 softwood boards and shall not be less than 1 x 4 boards.

Solid sheathing is acceptable and may be required in seismic regions or under treated shakes and shingles. Solid sheathing is used in areas with wind-driven snow. Please note that the only solid sheet sheathing tested with shakes and shingles is plywood. Check with your local building official for plywood thickness/ dimensions. Eave protection is used on the edge where 36" felt underlay is used and should extend up at least 24" beyond the exterior wall but it is not meant to cover the entire roof.

Staggered butt applications

Staggered butt applications are made by shortening the exposure less than the greater maximum exposure. No shakes or shingles shall be applied greater than the maximum exposure allowed. Check with local building codes for approval of this installation method.

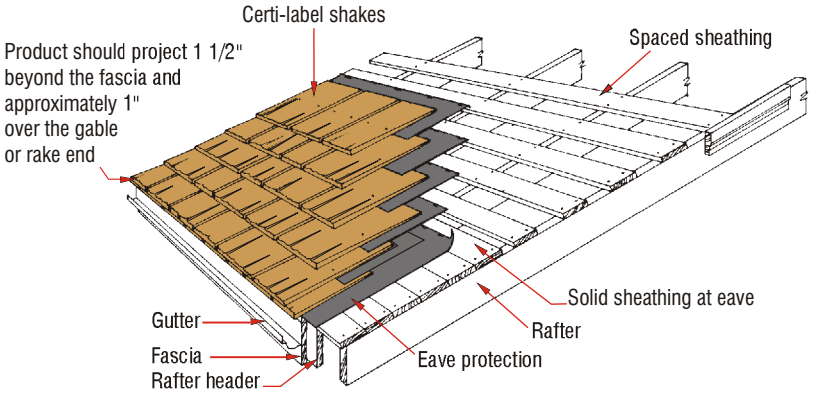
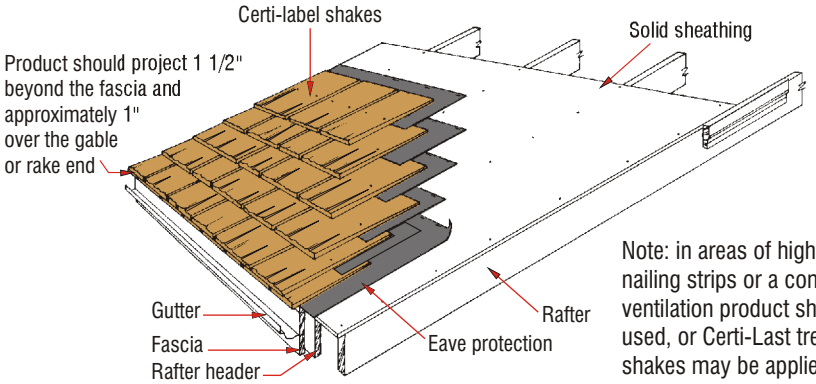


Figure 1: Spaced Sheathing
For applications using varied exposures, the center of the sheathing board should be equal to the distance of the exposure.



Note: in areas of high humidity, nailing strips or a continuous ventilation product should be used, or Certi-Last treated shakes may be applied directly to the deck.

Figure 2: Solid Sheathing

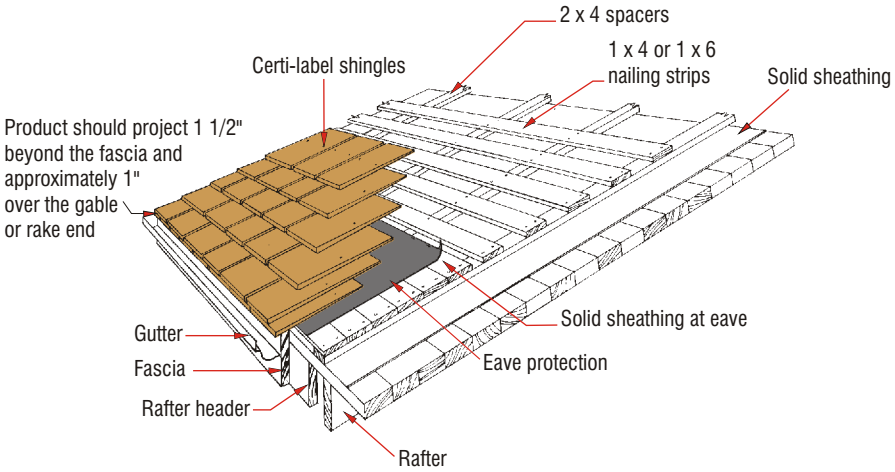


Figure 3: Spaced Over Solid Combination Sheathing
This is the preferred system for shingle application, in areas with high humidity or where additional ventilation is required. When using Certi-Last products, they may be applied directly to the deck.

Certi-label Shakes

In shake application spaced sheathing is usually 1 x 6 boards spaced on centers equal to the weather exposure (Table 4, Page 20) at which the shakes are to be laid - *but never more than 7 1/2" for 18" shakes and 10" for 24" shakes on roof installations.* When 1 x 4 spaced sheathing is installed at 10" on center, additional 1 x 4 boards must be installed (i.e. maximum allowable spacing is approximately 3 1/2" measured from edge to edge between the sheathing boards). Please note that the only solid sheet sheathing tested with shakes and shingles is plywood. Check with your local building official for plywood thickness/ dimensions. A solid deck is recommended in areas where wind-driven snow is encountered. Roofing felt system interlay between the shake courses is required whether the sheathing is spaced or solid. The felt interlay acts as a baffle that prevents wind-driven snow or other foreign material from entering the attic cavity during extreme weather conditions. The felt interlays also increase the roof's insulating value. The felt system interlay forces water to the surface.

Special care should be taken when installing the felt interlays over spaced sheathing to ensure that an effective baffle is formed (Figure 4). The felt should be applied over the top portion of the shakes and extend on to the spaced sheathing so that the bottom edge of the felt is positioned at a distance above the butt equal to twice the weather exposure.

Certi-label Shake Application

Shakes, like shingles, are normally applied in straight, single courses. The following application details (Figure 4) must be observed.

1. The starter course may be one or two layers of cedar shingles or shakes overlaid with the desired shake. A 15" shake is made expressly for starter and finish courses.
2. Butts of first course shakes should project 1 1/2" beyond the fascia and approximately 1" over the gable or rake end.
3. The CSSB recommends using an 18" wide strip of Type 30 roofing felt laid over the top portion of the shakes and extending on to the sheathing. (Check with your local building official for exact specifications in your area). The bottom edge of the felt should be positioned above the butt of the shake at a distance equal to twice the weather exposure.

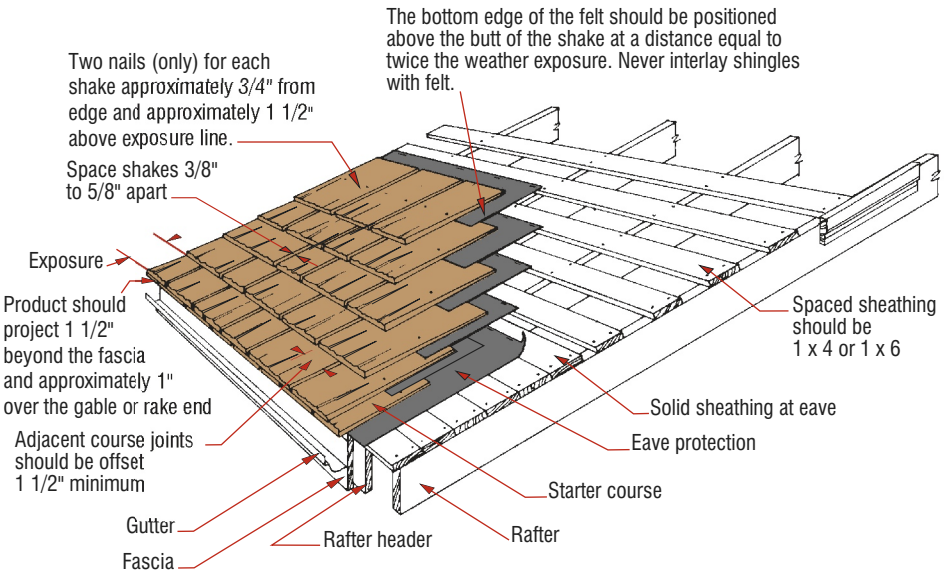


Figure 4: Certi-label Shake Application

(3. continued:)
For example, 24" shakes felt extends up 14" onto the sheathing forcing water to the surface.

4. Spacing between adjacent shakes should be a minimum of 3/8" and a maximum of 5/8".
5. Shakes shall be laid with a side lap of not less than 1 1/2" between joints in adjacent courses.
6. Straight-split shakes should be laid with the froe-end (the end from which the shake has been split and which is smoother) towards the ridge.

Architect: Good Architecture, Photo: Celia Pearson

MANSARD ROOF DETAILS

The mansard is particularly well suited to renovation work on pitched roof houses because the upper story can be enlarged without adding extra height to the structure.

The low downward slope of the mansard roof line acts visually to reduce the scale of a building and helps to eliminate a boxy appearance. This technique is used frequently on large commercial projects, particularly those near residential neighborhoods. It is also a common solution to the problem of avoiding a monotonous appearance on flat-roofed frame apartment buildings.

Properly used, a mansard roof can strengthen the design without substantially increasing construction costs. If raised up above the level of a built-up roof the mansard can screen out roof penetrations or mechanical equipment.

The variety of mansard roofs is practically infinite. One of the most widely used (and misused) roof designs, its proportions and scale are very important and care should be taken to avoid a mansard roof line that is either too skimpy or too generous.

Two of the most widely used roofing materials on the mansard roof are Certi-label cedar shakes and shingles. Cedar shakes, with their heavier texture and solid appearance, are perhaps more frequently specified for mansards although shingles are also used, particularly when a lighter scale is desired.

The light weight and ease of application of Certi-label shakes and shingles contribute substantially to economical construction. They can be installed over light framing - usually spaced battens - thus affording a considerable saving in both materials and labor as opposed to cladding that requires a solid base.

Construction details for typical mansard roofs are shown in Figure 6.

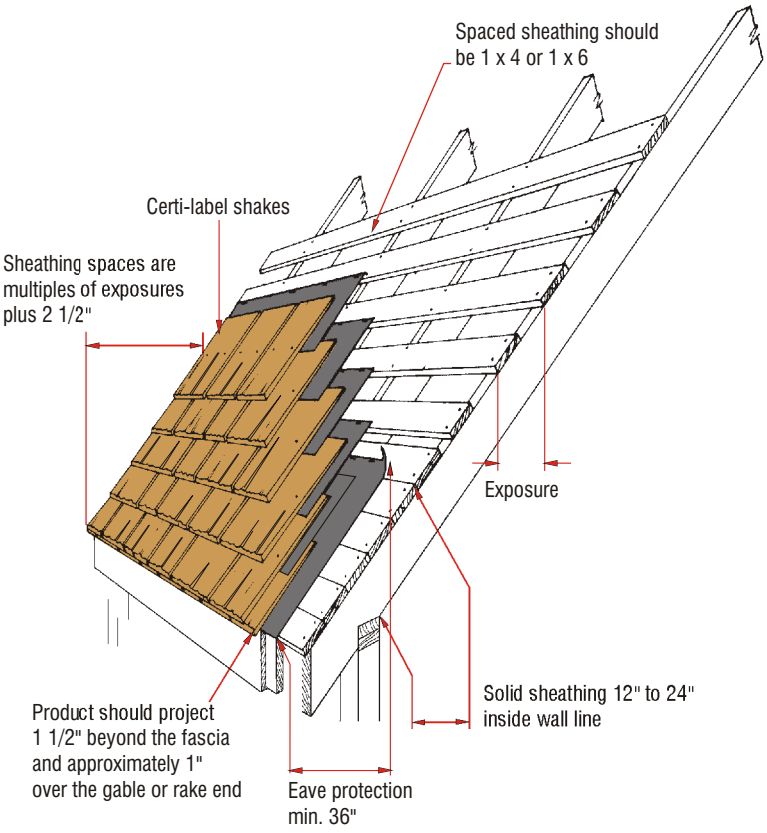


Figure 6: Mansard Roof

Photo: Murray Levin

The minimum roof slope on which Certi-label shakes are recommended is 4:12 and for Certi-label shingles, 3:12. It is possible, however, to apply Certi-label shakes or shingles successfully to solid sheathed roofs of lower slope providing a special method of application is followed (Figure 7). The prescribed method provides a double roof on which the Certi-label shakes or shingles are applied to a lattice-like framework embedded in a bituminous surface coating.

A hot mop or similar approved membrane should be applied over the roof deck. Consult your local building official for approved products in your area. With the final hot-mop application 2 x 4 spacers of Western Red Cedar or preservative treated lumber are embedded in the bituminous coating. These spacers are installed over the rafters and extend from eave to ridge. Check with your local building official for their preference in your area.

Next, 1 x 4 or 1 x 6 nailing strips, spaced according to the weather exposure selected for the Certi-label shakes or shingles, should be nailed across the spacers to form a lattice-like nailing base. For example, if 24" shakes are to be installed at a weather exposure of 10", the nailing strips would also be spaced at 10" on centers. When 1 x 4 spaced sheathing is installed at 10" on center, additional 1 x 4 boards must be installed.

Finally, the Certi-label shakes or shingles are applied in the normal manner with a starter course at the eave and felt interlays between each course of shakes (Figure 7).

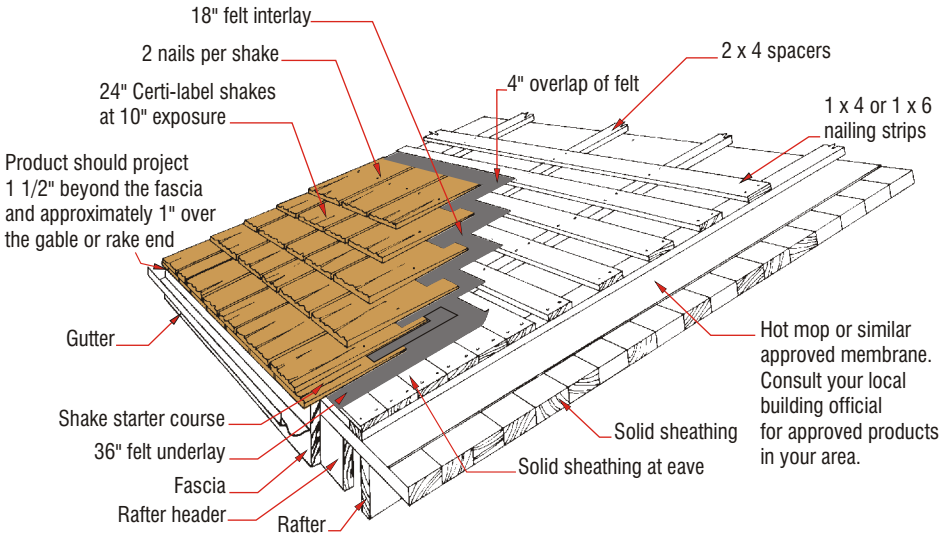


Figure 7: Certi-label Shake Application to Low Slope Roofs

Certi-label Hip And Ridge Details

Intersecting roof surfaces at hips and ridges should be capped to ensure a weather-tight joint. Site-made or factory-assembled hip and ridge units may be used, but both types must have alternate overlaps and concealed nailing (Figure 8). Weather exposures when ridge cap and field product are the same length should be the same as the field of the roof. Nails must be longer than those used on the field of the roof and of sufficient length to penetrate 3/4" into or completely through the sheathing. Install a strip of felt, eave protection material or metal over hip or ridge under the ridge or hip cap. If longer or shorter ridge cap is used, adjust exposure accordingly.

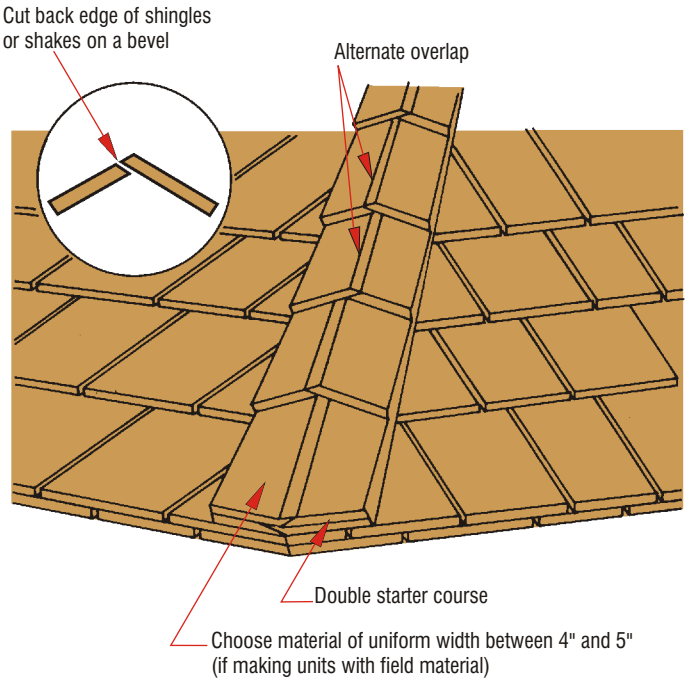


Figure 8: Certi-label Hip and Ridge Application

Correct construction of roof junctures and slope transitions is vital to ensure the integrity of the roof system. In the following cases, where metal flashing is employed, it should be no less than 26 gauge galvanized steel or acceptable equivalent. Check with your local building official for their preference in your area. It should be painted on both sides with a good metal or bituminous paint. Flashing materials should be painted after bending to maintain the integrity of the coating.

Convex Juncture

On this type of juncture (Figure 9) metal flashings should be installed to cover the top 4" of the wall and the bottom 8" of the roof slope before the final course of Certi-label shakes or shingles is nailed to the top of the wall. A strip of wood molding can be applied after final wall course is installed. A double or triple starter course is then applied at the eave, with a 1 1/2" overhang over outside wall trim. The roof can then be completed in the normal manner.

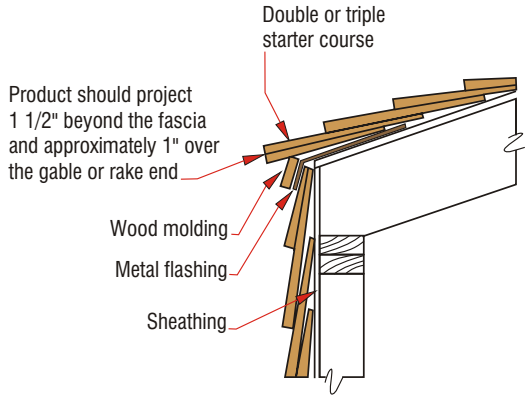


Figure 9: Convex Roof Juncture

Concave Juncture

Metal flashings for the concave juncture (Figure 10) are similar to those for the convex type. They should be installed to cover the top of the roof slope and the bottom 4" of the wall before the final course of Certi-label shakes or shingles is installed. The final roof course should be installed so that the tips fit as snugly as possible against the wall at the juncture. A double starter course should be applied at the start of the wall surface and the remaining wall courses applied in the recommended manner. If nails are not acceptable through exposed metal, metal clips can be used to hold down flashing.

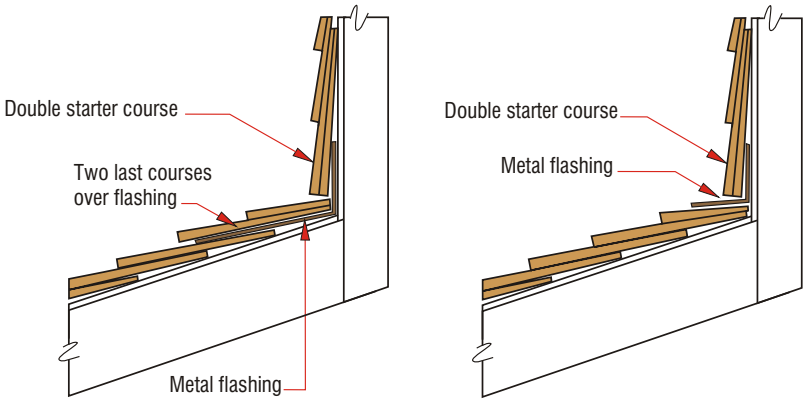


Figure 10: Concave Roof Juncture

Roof Transitions

Roof transitions (Figure 11) require appropriate flashing, felt and product application. Changes in roof slope should be detailed in a similar manner as concave junctures, to ensure the integrity of the roof system. Solid sheathing is required above and below the change in slope, metal flashing is required across the change in slope, and a 36" strip of starter felt is required on the upper slope, installed in the same fashion as at the eaves.

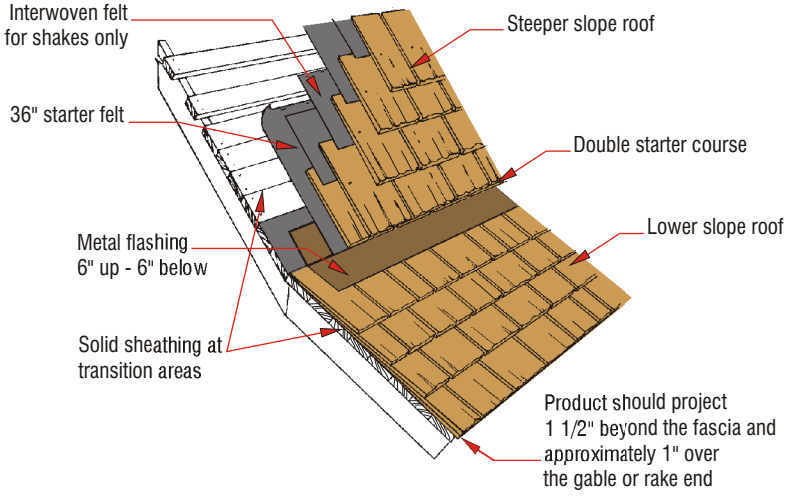


Figure 11: Low Slope to Steep Slope Roof Transition Detail - Certi-label Shakes
(Certigrade shingle application is similar but without felt interlay)

Apex Juncture

On this roof juncture (Figure 12) metal flashing should cover the top 8" of the roof and the top 4" of the wall. It should be installed before the final course of Certi-label shakes or shingles is applied to the wall. The recommended sequence of application is to apply Certi-label shakes or shingles first to the wall then to the roof. The overhanging roof material is then trimmed flush with the wall. Finally, specially prepared ridge units are applied over the wall-roof juncture so that in each matching pair the roof piece overlaps the wall piece each time.

Swept or Bell Eave

When Certi-label shakes or shingles are to be applied to a swept or bell eave where the curvature is excessive, it may be necessary to soak them for a period (usually overnight) or steam them prior to installation. A double starter course is employed in the usual manner. Exposure is determined by the slope of the roof and the type of Certi-label shake or shingle selected. At lower pitches waterproof eave protection should be used.

Note: For unusual roof applications contact the Cedar Shake & Shingle Bureau for a list of members who can assist you with specific questions.

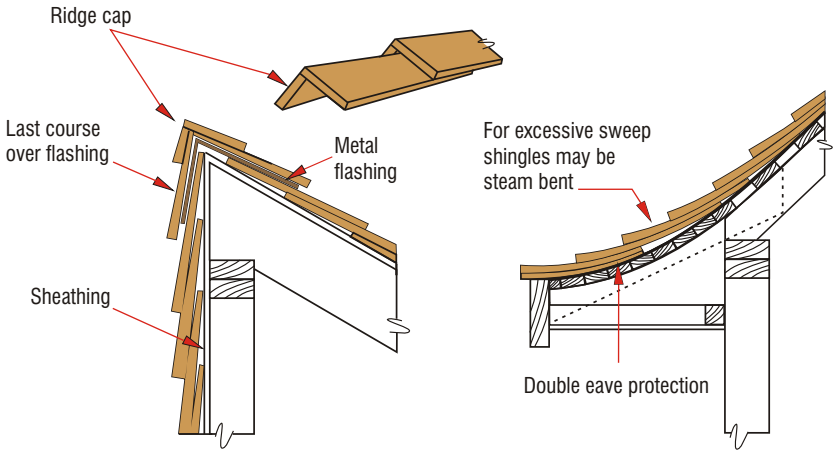


Figure 12: Apex Roof Juncture and Swept or Bell Eave

Architect: Frederick Bentz/Milo Thompson/Robert Rietow, Inc. Photo: George Heinrich

Most roof leaks can occur where water is channelled off the roof or where the roof abuts a vertical wall or chimney. At these points, metal valleys and flashings are used to assist the Certi-label shakes and shingles in keeping the structure sound and dry.

Structural members that join a roof should also be flashed at all intersecting angles to prevent leakage. Step flashing should extend under the Certi-label shakes and shingles, up the vertical surface, (one flashing installed on each course concealed under the covering course) and should be covered by a second layer of flashing (counter-flashing).

Flashing should be pre-painted both sides using a good metal or bituminous paint (Figure 13a). Flashing strips which must be bent to sharp angles should be painted after bending. Metal flashing with baked-on enamel coating is available in some areas.

Different flashing metals are available in different areas depending on climatic variations. It is good practice to use metals that have proven their reliability under the specific conditions to be encountered. It is important that metal flashing have the same longevity as Western Red Cedar. Check with your local building official for their preference in your area.

Valleys: Certi-label Shingles

For roofs with slopes of 12:12 or greater, valley flashing should extend not less than 8" on each side of the valley centerline. For roof slopes less than 12:12, flashing should extend not less than 11" each side. Valley flashing should be center-crimped, painted, galvanized steel or aluminum. Valley metal should be underlayed with minimum Type 30 roofing felt. Shingles should not be applied with their grain parallel to the valley centerline and those extending into the valley should be cut at the correct angle (Figure 13b).

Valleys: Certi-label Shakes

On shake roofs it is recommended that a strip of Type 30 roofing felt be installed over the sheathing and under the metal valley. Metal valleys should be center-crimped, painted, galvanized steel or aluminum and should extend not less than 11" on each side of the valley centerline. In some areas, however, flashing width requirements may differ and local building codes should be consulted. Shakes should not be applied with their grain parallel to the valley centerline and those extending into the valley should be cut at the correct angle (Figure 13d).

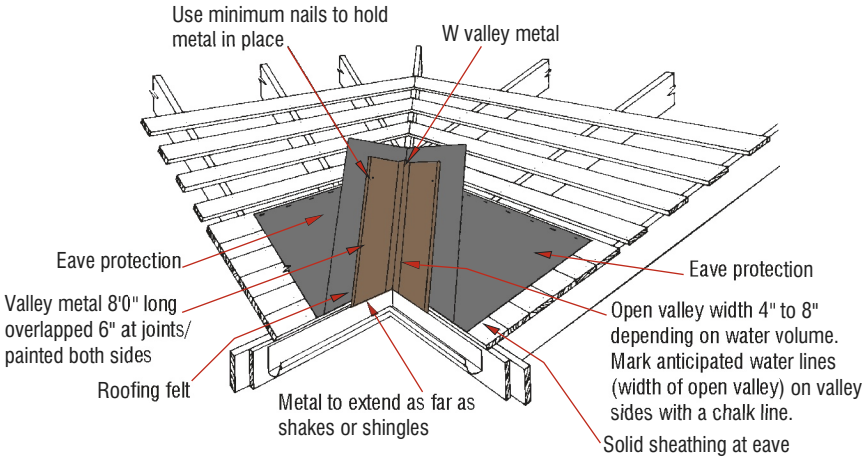


Figure 13a: Valley Metal

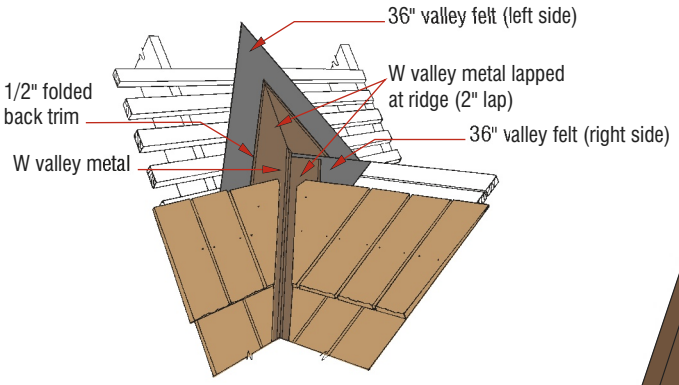


Figure 13b: Typical Saddle Flashing Detail

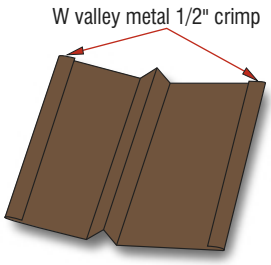


Figure 13c: Roof Valley Flashing Detail

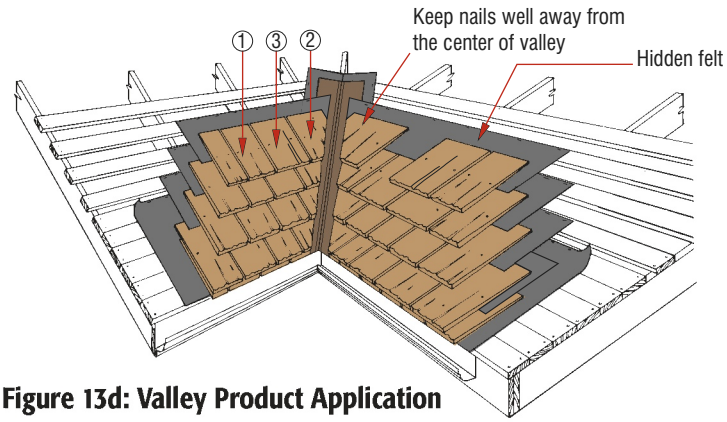


Figure 13d: Valley Product Application

Order of applying Certi-label shakes or shingles at valley:

1. Stop course line here
2. Place pre-cut piece so that cut-angle is positioned on the valley guide chalk line with tip on course line.
3. Select product of the required width to complete the course of Certi-label shakes or shingles.

Figure 13: Flashing Details for Shake and Shingle Valleys

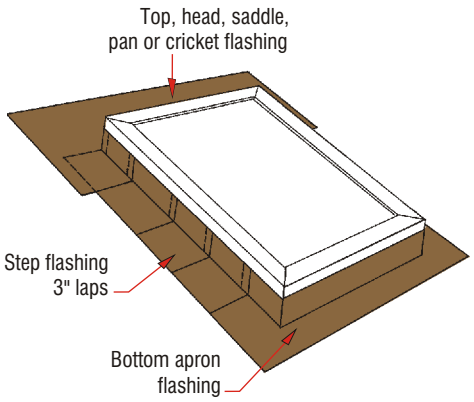


Figure 14a: Skylight Flashing

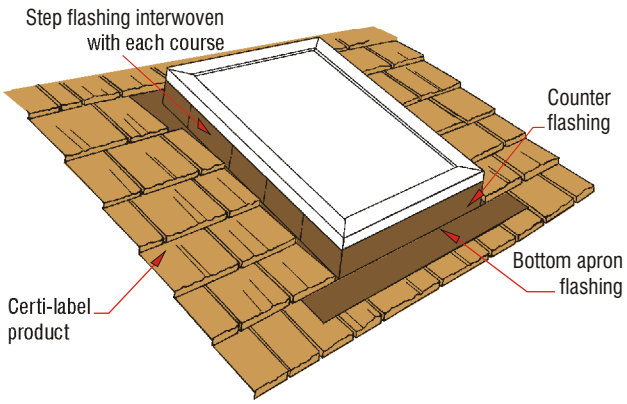
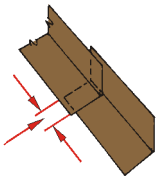


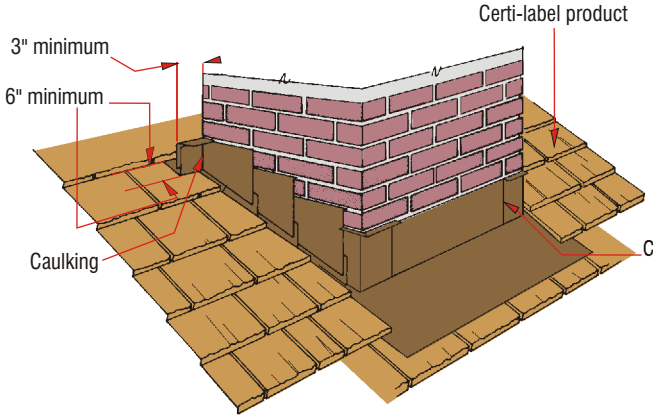
Figure 14b: Skylight Installation

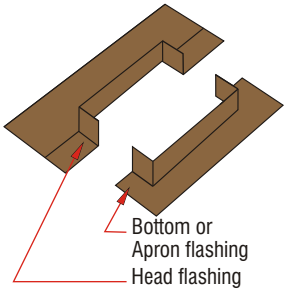


Typical chimney flashing
not requiring soldering

Step flashing 3"
minimum overlap

Recommended step flashing width		
	Shakes	Shingles
Horizontal width	4"	2 1/2"
Vertical width	3"	2 1/2"





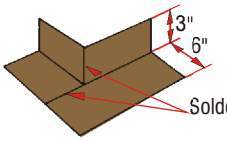


Figure 14c: Typical Projection Flashing

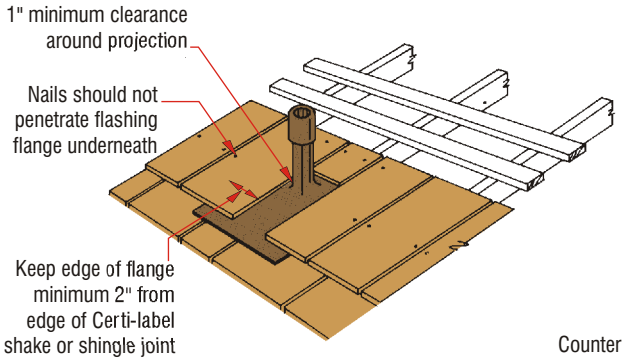
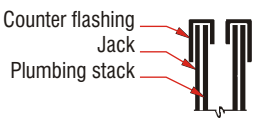


Figure 14d: Typical Projection Flashing



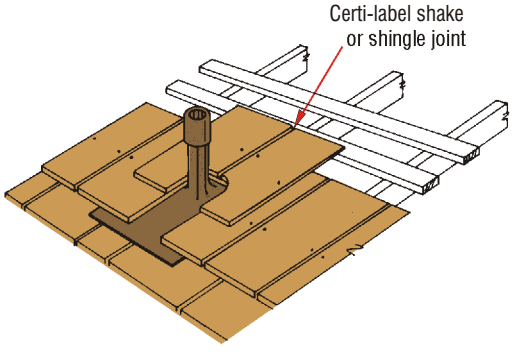


Figure 14e: Typical Projection Flashing

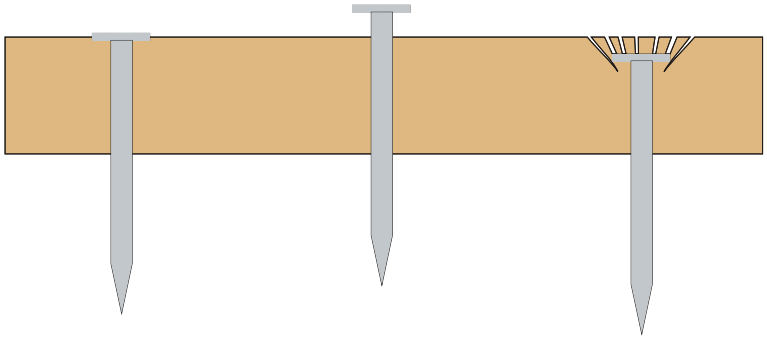
Figure 14: Flashing Details for Typical Roof Projections

ROOF FASTENER GUIDELINES

Important Notes:

Underdriving or overdriving any fastener will affect the integrity of the roofing system.

Certi-Guard (fire-retardant-treated) or Certi-Last (preservative-treated) shakes and shingles:
ALWAYS ask the treatment company which fasteners are recommended for use with their pressure-treated Certi-label shakes or shingles. Some fasteners are not compatible with treated material.



YES
Correct - flush with surface

NO
Underdriven

NO
Overdriven

Fasteners	
Type of Certi-label Shake or Shingle	**Nail Type and Minimum Length**
Certi-Split & Certi-Sawn Shakes (in)	**Type**
18" Straight-Split	5d Box 1 3/4
18" and 24" Handsplit-and-Resawn	6d Box 2
24" Tapersplit	5d Box 1 3/4
18" and 24" Tapersawn	6d Box 2
Certigrade Shingles	**Type (in)**
16" and 18" Shingles	3d Box 1 1/4

Nails

Each Certi-label shake or shingle should be applied with two corrosion-resistant fasteners, such as stainless steel (type 304 or 316), hot-dipped zinc coated, or aluminum nails or other fastener as accepted by your local building official. Minimum nail lengths are shown in the fastener chart on the left.

Staples

Staples should be aluminum or stainless steel (type 304 or 316) 16 gauge or other fastener as accepted by your local building official. Two staples should be driven per Certi-label shake or shingle with the staple crowns 7/16" minimum horizontal, maximum 3/4" horizontal, to the Certi-label shake or shingle butt. Staples are driven in the same location as nails relative to the sides and overlapping butt line. Staples should be long enough to penetrate into the sheathing at least 3/4" or all the way through and driven flush with the surface of the Certi-label shake or shingle.

Architect: Myrvang Architects, Photo: John Gussman Photography

Ventilation Guidelines

The importance of good attic ventilation beneath the roof cannot be overemphasized. Such movement of air will prevent or inhibit condensation of moisture on the undersurface of the Certi-label shakes or shingles, or on the roof decks. Vents should be provided at the soffits (eaves) as well as at gable ends (screened to prevent ingress of insects), on roof by using attic roof ventilation or preferably the ridge lines with cross-ventilation desirable. A rule of thumb for adequate ventilation is that the ratio of total net free ventilation area to the area of the attic should be not less than 1:150, with compensation made for screens over vent apertures. In the case of a balanced system a 1 square foot per 300 square feet of floor area may be adequate ventilation. Check with your local building department. Attic fans may be beneficial, these supplying additional movement of air in attic spaces. Several roof ventilation construction techniques are shown in Figures 15a-c.

Any modification to the vapor barrier system or addition of a vapor barrier system should only be done after consulting with your local building official or a building envelope specialist. In some areas, building envelope specialists are regulated by government. Please check with local building officials to see if there are professional requirements in your area.

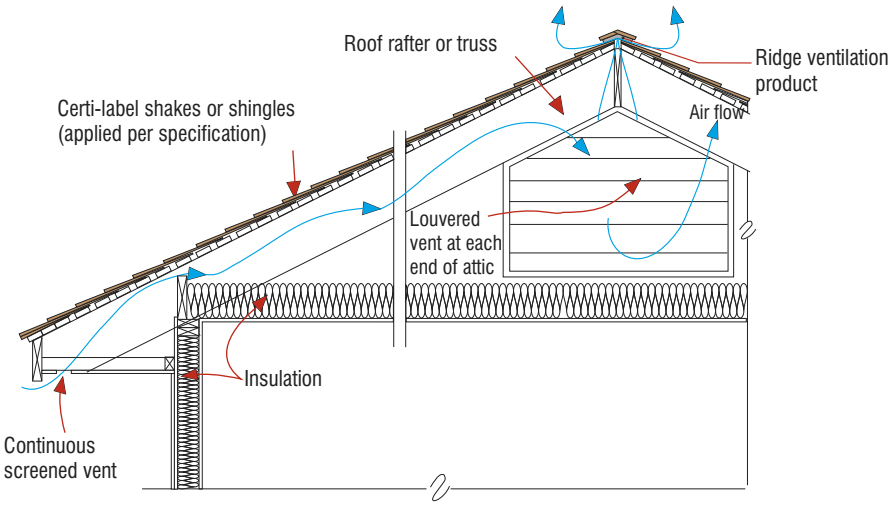


Figure 15a: Gable Roof With Attic

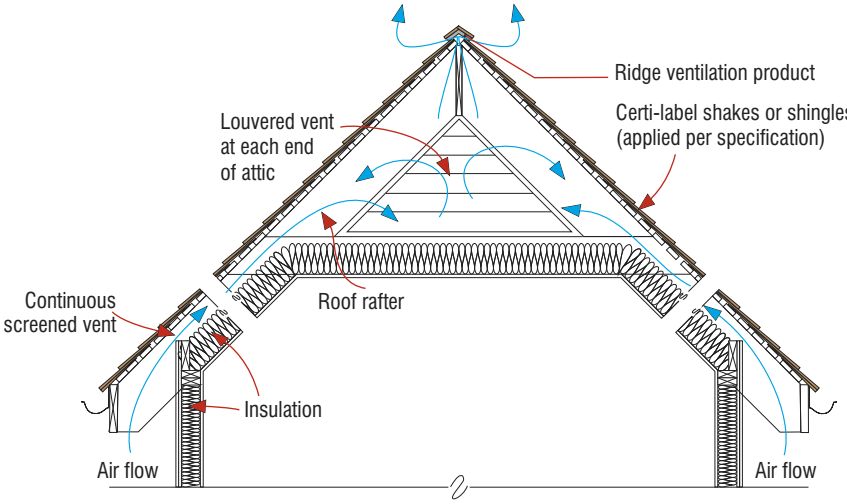


Figure 15b: Cathedral Ceiling With Partial Attic

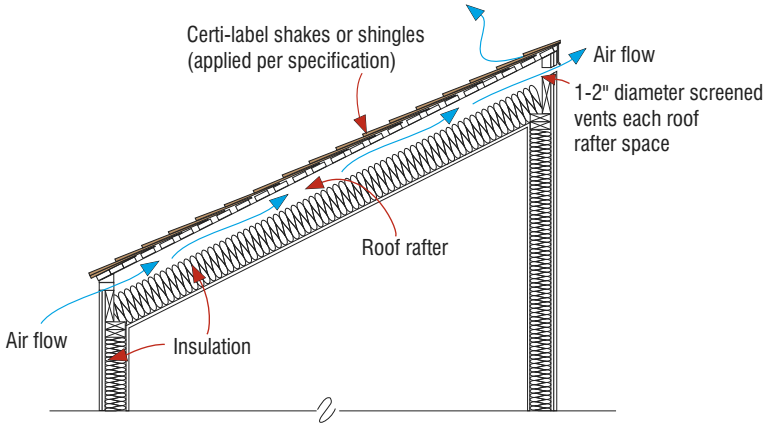


Figure 15c: Shed Roof

Figure 15: Ventilation Details

Ridge Vents

A rule of thumb for venting the attic area is 1 square foot per 150 square feet of floor area. One half of this (1/2 square feet per 75 square feet of floor area) amount should be in the soffit or eave and one half (75 square feet) in the roof system. In the case of a balanced system a 1 square foot per 300 square feet of floor area may be adequate ventilation. Check with your local building department.

Low Slope (6:12 or less)

The CSSB recommends the installation of ridge vents that allow for installation of pre-manufactured ridge applied over the vent material. There are many manufacturers of this design.

Steep Slope (8:12 or greater)

On steep slope roofs, the correct ridge vent products can actually facilitate the ease of installation of Certi-label ridge units. Always follow the manufacturer's installation instructions. The predominant ridge material manufactured today is for a low slope roof. However, by using a ridge vent that is malleable and at least 8 1/2" wide, the material can be installed across the minimum 3" of air space at the ridge to create a shallowing of the slope at the ridge. Care must be taken to caulk the ridge vent material to the Certi-label shakes or shingles. Proper nailing of the ridge units will create a serviceable application.

Severe Climate Areas

In all wind driven snow areas, the proper ridge vent should have a screening effect to prevent snow infiltration (not louvered or baffled).

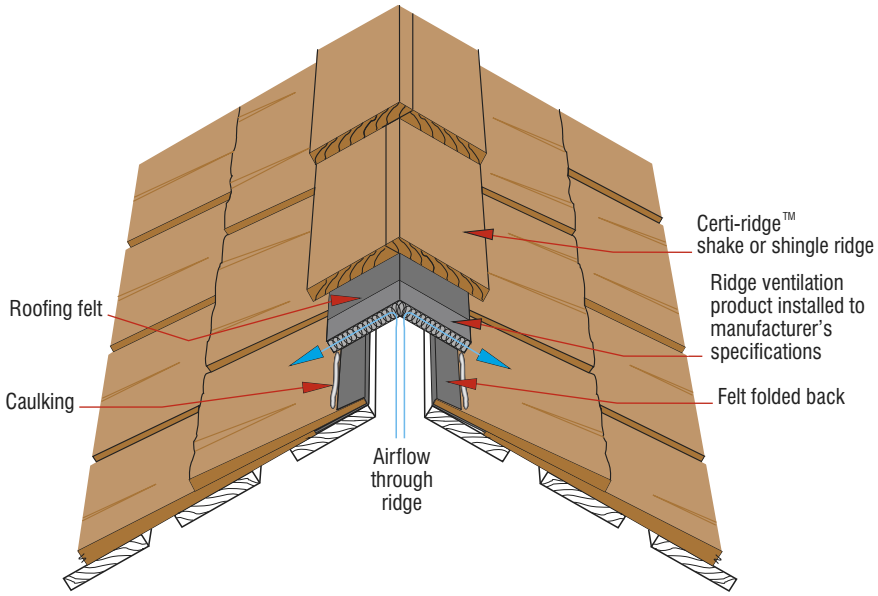


Figure 16: Ridge Ventilation Detail

Architect: Gaylord Granger, Libby O' Brien-Smith Architects, Photo: Eduardo Calderon

Certi-label shakes and shingles are an excellent roofing material for cold weather areas that experience heavy snowfall and severe temperature extremes. Certi-label shakes and shingles offer the advantages of durability, superior wind resistance and good thermal and acoustical properties. As with any other roofing material, however, their best performance depends upon proper design, sound construction practice and correct installation.

In cold weather areas and particularly in mountain regions that experience very heavy snowfall, the cold roof - or vented roof system - is recommended (Figure 21). The principle of this system is to allow a constant flow of cold air above the insulation but below the roofing material. With other roofing systems, ice buildup along the eaves can be a problem. Heat escapes from the insulation and melts snow, which runs down the roof to the cold overhangs where it freezes, causing water to back up and sometimes penetrate the roof systems. A properly installed, vented cold roof eliminates this problem. Venting space should be sufficient to allow a free flow of air from eave to ridge.

There are a number of important considerations that influence roof performance in areas of heavy snowfall, particularly mountain regions.

Design, of course, is very important. The steeper the roof the better the performance. Chimneys should be located at the ridge or gable ends away from possible snow pressure on the slopes. Plumbing pipes should be located on inside walls and should be extended between the rafters and vented at the ridge. If this is not practical then plumbing vent pipes should be galvanized iron, well anchored inside the roof. (Plastic vent pipes extending through the roof may be dislodged by sliding snow.)

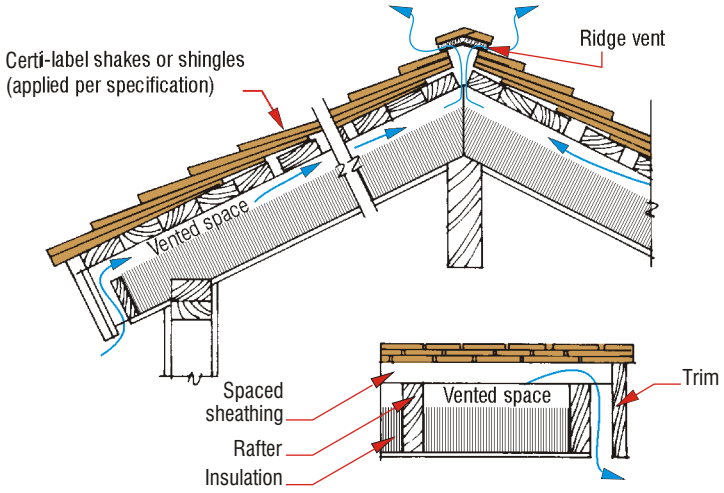


Figure 21a: Gable Roof

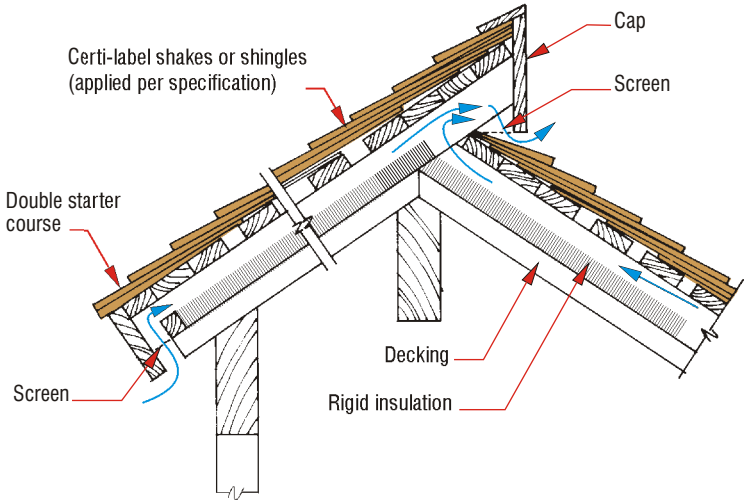


Figure 21b: Shed Roof

Figure 21: Cold Roof Systems

Architect: 3D Building, Photo: David Reeves Studio, Inc.

Wide overhangs at the eaves should be avoided as they provide large cold areas for snow and ice build-up. A strip of metal along the eaves helps shed ice quickly. Sliding ice and snow are constant hazards and should be given primary consideration in the total building design. Outside doors should not be located at the bottom of a roof slope. Entrances and all pedestrian traffic areas are better situated beneath the gable ends of the roof.

Care must be taken in applying the sheathing boards to facilitate proper nailing. Shake or shingle side lap should be increased to 2". The entire roof must be laid with the same precautions as those taken for any other type of wood shake or shingle roof, with eave protection and an interlay felt between shakes.

Care in cold roof design and installation will result in a sound roof system giving many years service during severe extremes of winter temperatures and snowfall.

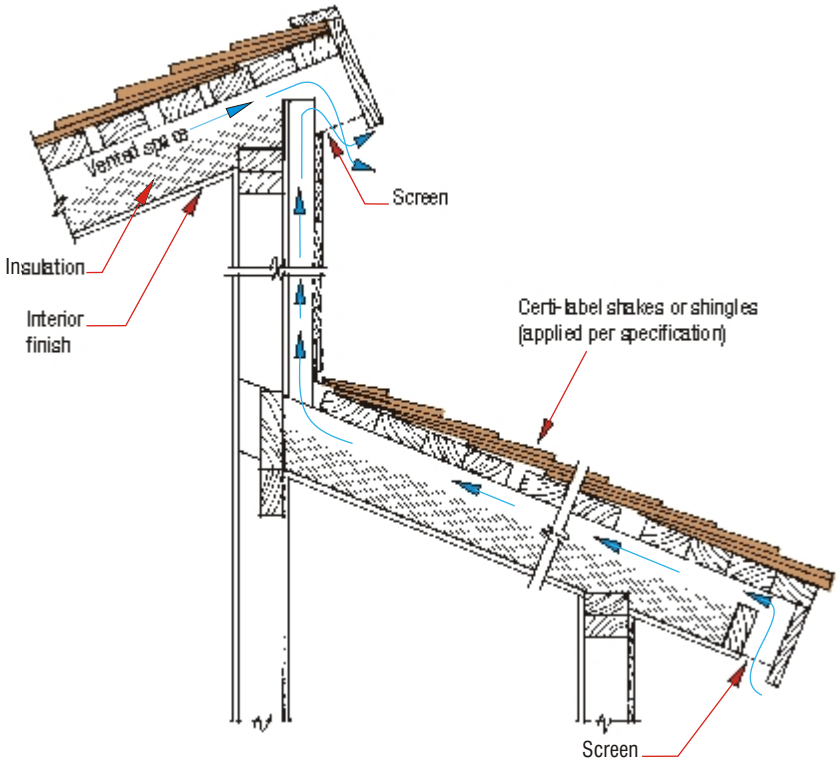


Figure 21c: Half Monitor Roof

Architect: David Estreich, Photo: Adam Fliss