

# ROOFS

## The Least You Need to Know:

- Properly maintaining your roof is one of the most important things you can do to protect your house from damage.
- Don't forget to check flashing, gutters and downspouts for needed repairs. The failure of a roof can often be linked back to these areas.
- Remember there are many other features that should be maintained and preserved: cornice, dormers, chimneys and other decorative features.
- Original roofing materials are character-defining features of buildings and should be retained if possible.
- New roofing material should be as close to the original as possible and compatible and appropriate for the building and historic district.

## Introduction

Roofs are important because they offer shelter to the activities in the building below. Roofs are highly vulnerable to the damaging effects of wind, rain, snow, and heat from the sun and a weather-tight roof is a necessity for the preservation of any structure - new or old. Problems inherent in the design of a historic roof can be controlled through the use of good materials and regular maintenance.

Although the functional requirements of a roof are important, roof design often goes beyond the merely functional and contributes considerably to the character of the building. The shape, size, color, pattern, and detailing of a roof are important elements that help define the building's character and add interest to the streetscape.



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## **Significance of Form**

Roofs, even those of simple form, help to determine the character of a building. The combination of the size, shape, and slope of a roof create a unique silhouette. Typical roof shapes include gable, gambrel, hip, mansard, shed, and flat.

Builders were guided by practical considerations in their selection of roof shapes. Often builders chose steeper slopes to shed snow and rain. Sometimes the need for attic space prompted the construction of a gambrel or mansard roof, which provided more space than a flat or gabled roof would. Ease of construction prompted other builders to choose a simple gable over a more complex mansard.

This combination of practicality and stylistic influence created buildings that relied heavily on the shape of the roof for character definition. Because roof shape is so important to the character of the building, the guidelines contained in this chapter should be followed when undertaking roof repairs and alterations.

## **The Significance of Roofing Material Appearance**

Like the shape and slope of the roof, roofing materials are also chosen for practical and aesthetic reasons. The choice of materials depended upon a number of factors, including availability of materials, availability of skilled artisans, roof pitch, and weather conditions. Steep roofs require materials such as shingles, slate, or tile to shed water. A flat roof calls for an unbroken surface. Moderately sloped roofs can be covered with metal or asphalt shingles.

In addition to providing a weather-tight surface, roof covering materials can add color, texture, and pattern to the roof. Shingles can be found in a variety of shapes and colors. Wood, slate, and metal offer variety in texture. The seams of metal roofs and the ways in which shingles are laid can create patterns of great visual interest. This combination of practical and aesthetic considerations has produced roofs that contribute to the overall architectural character of Mercersburg.

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### **Guidelines for Roof Material Details**

If new roofing details will be readily visible, their appearance should be based on architectural evidence or on historic prototypes.

The spacing of the seams on a standing seam metal roof will affect the building's overall scale and should therefore match the original dimensions of the seams.

### **Guidelines for Determining if Roof Materials Should Be Replaced:**

Calculate the amount of damaged and missing material. If the amount is less than 20% and the roof is in generally good condition, the material should be repaired. If the amount is over 20%, consider replacement. If the amount is near 20%, consider the age and condition of the roof in relation to its expected serviceable life. Remember, the older the roof gets, the more repair it will need.

Don't replace an entire roof if only one slope is deteriorated. If one slope has weathered more heavily than the other slopes, consider replacing it and repairing the others.

Check for the source of any active leaks. Gutters, valleys, and flashing are at fault more often than roof covering materials. Don't replace materials if other features are the source of leaks.

Check the roof rafters and sheathing for moisture stains and rot. Deteriorating materials can hold moisture that will cause adjacent wood to rot. Replace wood and structural members as necessary. If only underlying roof elements are deteriorated, attempt to carefully remove and then reuse the historic roof covering materials once the underlying trouble is resolved.

Check to see if the fasteners are corroding, loose, or missing. Replace the fasteners and reuse the materials.

Consider the availability of replacement materials.

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## Roof Materials: Deterioration & Replacement

The most commonly used roofing materials in Mercersburg are metal, slate, and wood. Most roofs with asphalt shingles are likely replacements. Each of these materials is described below. Information is also provided on typical patterns of deterioration and replacement options.

### Metal

Metal roofing began to be used in the nineteenth century. After about 1850, when manufacturing facilities for these products were established in the United States, sheet metals became more popular. To cover roofs of low or moderate pitch, individual sheets are joined by upright (standing) or flat seams. This is probably the most common roofing material in Mercersburg.



Deterioration: Metal roofing can last a long time if properly maintained. Early metal roofs were painted regularly. However, metal will deteriorate and will eventually rust. Metal roofing can also deteriorate from chemical action caused by pollution and acid rain, which cause pitting and streaking. Because metal expands and contracts with changes in temperature, metal roofs are subject to thermal movement, buckling, and warping. These problems can lead to cracks in joints and open seams. Metal roofs are also subject to corrosion that occurs when incompatible materials, such as copper sheets and iron nails, are in direct contact. If metal roofing is severely rusted, if it contains numerous holes and splits, if several sheets have buckled or warped, if edges and joints are disfigured, or if there are large areas of thin or worn material, consider replacing the material in kind. If only a few spots have rusted or if a few holes exist, proceed with repair rather than replacement. If a single sheet has slipped, repair it.

Replacement Materials: Sheet aluminum, copper, lead-coated copper, galvanized metal, painted steel and zinc are all available today, as are a variety of metal coatings. Imitation standing seam metal roofs are available but must be carefully evaluated to ensure that the distance between the “seams” is as close to original as possible. There are many modern galvanized metal roofs available today that are manufacturing primarily for pole buildings or agricultural buildings. Typically they have a larger raised “V” to imitate a seam with two smaller raised “V”s in between. This style of roofing is NOT an acceptable replacement for an historic standing seam metal roof.

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### Slate

Slate began to be used during the Colonial period, but its initial use was limited because of cost. In the mid-nineteenth century, canals and railroads made slate more accessible and economical, and it became more widely used. The color and texture of slate varies according to its place of origin. Grey, blue, and green shades are available. In Mercersburg, grey and blue-gray slates are common. The remaining slate roofs in Mercersburg are a significant historic resource; their preservation should be a priority.



Deterioration: The most typical problem with slate is with the nails used to install it. Iron nails usually fail before the slate does. If this happens, reattach the historic slates with copper nails and copper flashing. Another problem with slate is delamination. As slate weathers, its surface is slowly chipped away. The slate scales and thin layers flake off. The slate eventually becomes soft and spongy and the inner layers begin to fall apart. In this condition, slate will hold moisture and can cause adjacent wood to deteriorate. Slate in this condition should be replaced. Missing slates or slates with visible holes, cracks, or breaks should also be replaced. Slates that have slipped should be reattached. A simple method to determine the condition of slate is to press firmly on the slate with your hand. Sound slates will be unaffected. Deteriorated slates will feel brittle and crack.

Replacement Materials: A number of manufacturers continue to offer new natural slate in a variety of shades. Salvaged slate is also available from a number of suppliers. If you choose to use natural slate, find a supply that matches your roof and get enough for current needs and for future repairs. A variety of synthetic slate look-alike products are also available on today's market. These products have a ceramic, concrete, fiber-cement, or mineral-polymer base. Appearance varies among the types and manufacturers. Review as many samples as possible before choosing one.

**Beware** of roofers who insist that slate roofs cannot be repaired. Be sure to hire a roofer who specializes in slate. Note: Clay tile roofs are similar to slate roofs in most respects. Slate, asbestos and clay tiles are fragile - don't walk on them.

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## Wood Shingles

Wood shingles of white pine, oak, elm, cypress, redwood, and red cedar were used for roofing throughout American architectural



history. Because they were a fire hazard, wood shingles were typically replaced as other more fire resistant materials became available.

Deterioration: Wood shingles are subject to all the typical type of exterior wood deterioration. (See *Exterior Wood and Siding* chapter) If wood shingles appear thin, eroded, cracked, cupped, split, spongy, or warped, the shingles are probably no longer providing sufficient weather protection. If only a few shingles are missing or damaged, replace them individually. Splits or holes in wood shingles can be treated with a piece of aluminum or galvanized steel under the shingle and roofing cement in the hole or crack. Moss and fungi on wood shingles hold moisture that can speed deterioration. Attempt to dry the roof by trimming trees that block the sun, and consider fungicide treatments. If a significant amount of water damage is visible in the attic, consider shingle replacement.

Replacement Materials: Southern pine, white pine, white oak, red cedar, and white cedar shingles are available today for replacement roofing. Fiber-cement shingles intended to match the appearance of wood shingles and wood shakes are also available.



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## Asphalt

Asphalt shingles were introduced to the building market around 1890 and gained wide popularity by about 1910. Asphalt shingles are made of asphalt-saturated felt or fiberglass, embedded



with mineral granules to reflect the heat and ultraviolet rays of the sun. They were considered a good roofing material because of their relative inexpensive cost and their fireproof quality. If your building was constructed before 1890 and it currently has asphalt shingles, the roof was probably originally covered with slate, wood, or metal.

Deterioration: Asphalt shingles can deteriorate due to inappropriate installation. Wind can lift and dislodge them. Over time, shingles may curl and lose their mineral covering. If more than 20% of asphalt shingles have curled or warped, if the mineral granule surface has been abraded, if they are cracked or dried out, if the overall surface is lumpy, if moss covering is pervasive, or if the surface has been numerous and repeatedly patched, consider replacement. Remember that trees may stain light colored shingles.

Replacement Materials: Most asphalt shingles available today are reinforced with fiberglass. These are an acceptable replacement for the earlier felt-based shingles. Manufacturers are now producing thicker asphalt-based shingles to suggest the appearance of natural materials like slate and wood. These are not appropriate for twentieth century houses that were originally roofed with asphalt shingles but can be an appropriate substitute for wood or slate roofs that are too deteriorated to be repaired. For all buildings, beware of dramatic colors on the roof. Asphalt shingle colors should mimic natural materials such as gray, brown, or black.

## Choosing Replacement Materials

When choosing replacement materials, cost and the life of the material are important factors. For example, slate and tile will last about three times longer than asphalt shingles. Additional factors for consideration include the fact that asphalt shingles will increase in price each time they are purchased, and, if scaffolding is required, it will be required two additional times, as well.

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## **Keep In Mind**

Replacing historic roofing materials in kind is preferred. Most historic materials continue to be available today. In addition, new technologies are making possible the fabrication of a number of substitute materials that more closely duplicate the appearance of historic materials. As these technologies continue to improve, the HARB is open to considering them as replacements for materials that are beyond repair when economic factors are a consideration. Samples of these materials should be obtained for review. Remember, although most paint color is not reviewed by the HARB, the color of roofing materials is reviewable.

## **Flashing**

Flashing is the thin metal material used to prevent water penetration into areas of your roof that is difficult or impossible to protect with the roof covering alone. Most roof leaks are caused by deteriorated flashing; leaks don't necessarily mean that the roof covering material (such as slate) is deteriorated and must be replaced. Flashing is typically installed around chimneys, dormer windows, vents, and at the intersections of additions, porches, bay windows, and parapet walls. Copper, terne, aluminum, steel, and lead are all used for flashing. Copper has the longest life. Steel has a shorter life span than copper. Aluminum has a shorter life than steel and easily tears, twists, and punctures.

Check the condition of flashing whenever you are making roof repairs. If a new roof is being installed, install new flashing if the existing material is not expected to last as long as the new roof.

## **Gutters and Downspouts**

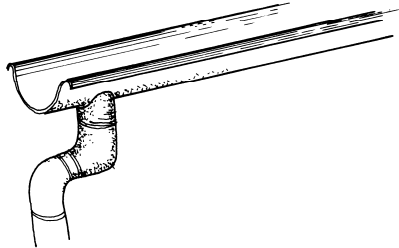
Gutters and downspouts have been used for decades to carry water off the roof and away from the building. Some early 19th century houses were equipped with built-in gutters. If your house has them, they are the best option for removing water from your building. Make every effort to maintain and retain the system in operating condition.

Gutters and downspouts have been made of wood, copper, galvanized steel, aluminum, and vinyl. Historic wood and copper gutters and downspouts are relatively rare and should be preserved. Copper gutters are durable, they don't need painting, and they take on a natural patina that protects them from deterioration. Galvanized steel with soldered joints is more



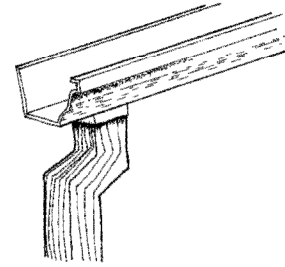
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economical than copper. Aluminum is less durable than steel and dents easily. Vinyl becomes brittle and may fracture in cold temperatures.



Half Round Profile

Gutters with a half-round profile are more appropriate for historic structures than the K-style profile. Plain round or rectangular downspouts are more appropriate for historic buildings than corrugated ones.



Modern K-style

The earliest buildings often did not have any type of gutter or downspout system. They sometimes have a water table or series of corbels on the façade of the building to help direct water away from the foundation. However, present day owners may find the lack of a gutter system to be a problem. While it is preferable to leave the design of the building as it was intended, the installation of gutters and downspouts should be allowed as long as an appropriate style is installed. Installation should be carefully done and all attachments into the historic material should be as discreet as possible and should not damage historic fabric.

Regularly cleaning gutters and downspouts, patching holes, and mending broken or loose elements will protect the roof and associated features. If additional gutters and downspouts are required, they should be installed on walls that are not readily visible from public streets or alleys. If they must be installed on main building walls, painting them the color of adjacent building materials will help hide them.

## **Rooftop Features**

**Chimneys:** One of the main elements in the visual profile of a house is its chimney, and many chimneys were originally built to match the architectural style of the house. For these reasons, the character of a chimney should be retained when improvements are being made. Because of their exposed position, chimneys are particularly susceptible to the effects of wind, rain, and frost. Brick and stone chimneys are subject to the same problems as brick and stone walls. (See the *Masonry* chapter of this manual for additional information.) Deteriorating flashing can also be a problem. Even if chimneys are no longer in use, they should not be removed or replaced.



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Snow Guards: Snow guards, also called snowbirds, are often found on Mercersburg's roofs. They were traditionally installed to avoid dangerous ice slides and to protect gutters, eaves, and cornices from snow and ice damage. Many of these elements were decoratively designed. They are often found near the eaves at the lower edge of slate and metal roofs in staggered rows, or on steeper roofs in greater quantities. The number of snow guards used depended on the slope of the roof. Iron or copper were typically used. Whenever possible,



these elements should be retained. If a new roof will be installed, consider carefully removing these snow guards and reinstalling them with the new roof.

Dormers: Existing dormers should be carefully maintained and repaired as necessary. Avoid adding new dormers to prominent slopes of the roof. If they are added on other slopes, they should be in proportion to the building. New dormers should have roof forms that match those of existing dormers, or if historic dormers are not present, the dormer roof should match the house roof or should be compatible with it. (See the *Windows and Doors* chapter of this manual for more information on windows.)



Skylights: Skylights were typically not a part of the historic design of houses in Mercersburg. If skylights must be added, they should be added only to roof slopes that are not visible from public streets or alleys. They should be flat and their placement should be compatible with the other windows of the building. Installation should not damage historic materials.

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## Where the Roof Meets the Wall

The part of a building where the roof meets the wall is often treated with ornamental elements. Sometimes elaborate, often simple and refined, these elements contribute significantly to the character of a building. They may include simple boards, moldings, panels, cornices, brackets, and ornamental brickwork.

All of these elements are subject to water damage, especially from water entering at the joint between the wall and the cornice or molding materials. Due to the distance from the ground to these elements, this damage often goes undetected. See the sections of this manual on windows, wooden walls, and masonry walls for additional information on deterioration and treatment.

Don't remove these elements simply because pieces are missing or damaged. Instead, look for replacement pieces or stock elements that could be used as substitutes. Never cover these elements with aluminum, vinyl, or other materials. This hides the important architectural elements and increases deterioration.



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