CITY OF PORTSMOUTH
Historic District Commission
Guidelines for Roofing

ROOFING

A building's roof provides the first line of defense against the elements while its design greatly affects the building's overall appearance. Portsmouth's roofs include a number of features that enhance the overall appearance of an individual building. These features include chimneys, dormers, cupolas, bell towers, steeples and widow's walks with their ornamental railings. As a result, a building's roof and associated features are also a typical indicator of its architectural style, a reflection of both its climate and its history.

The following functional and aesthetic concerns should be evaluated when considering a new roof or roof alteration:

- Weather-tight roofing preserves a building and provides shelter from storm water, wind and sun
- Roofing and roof features help define a building's character, silhouette and architectural style, with variations adding visual interest along a streetscape and the City's skyline
- The form, color and texture of the roof and its associated features affect the scale and massing of the building
- Retaining historic roof features and accessories can enhance a roof's overall character and appearance
- The addition of non-historic elements to a roof, such as roof decks and equipment should be minimized and shielded from view

These *Guidelines* were developed in conjunction with the City of Portsmouth's Historic District Commission (HDC) and the Planning Department. Please review this information during the early stages of planning a project. Familiarity with this material can assist in moving a project quickly through the approval process, saving applicants both time and money.

In its review, the HDC considers a property's classification, recommending the greatest historic authenticity at focal buildings, with more flexibility at contributing structures, and the most at non-contributing properties. The HDC Staff in the Planning Department is available to provide informal informational meetings with potential applicants who are considering improvements to their properties.

Additional *Guidelines* addressing other historic building topics are available at City Hall and on the Commission's website at **www.planportsmouth.com/historicdistrictcommission**. For more information, to clarify whether a proposed project requires HDC review, or to obtain permit applications, please call the Planning Department at (603) 610-7216.

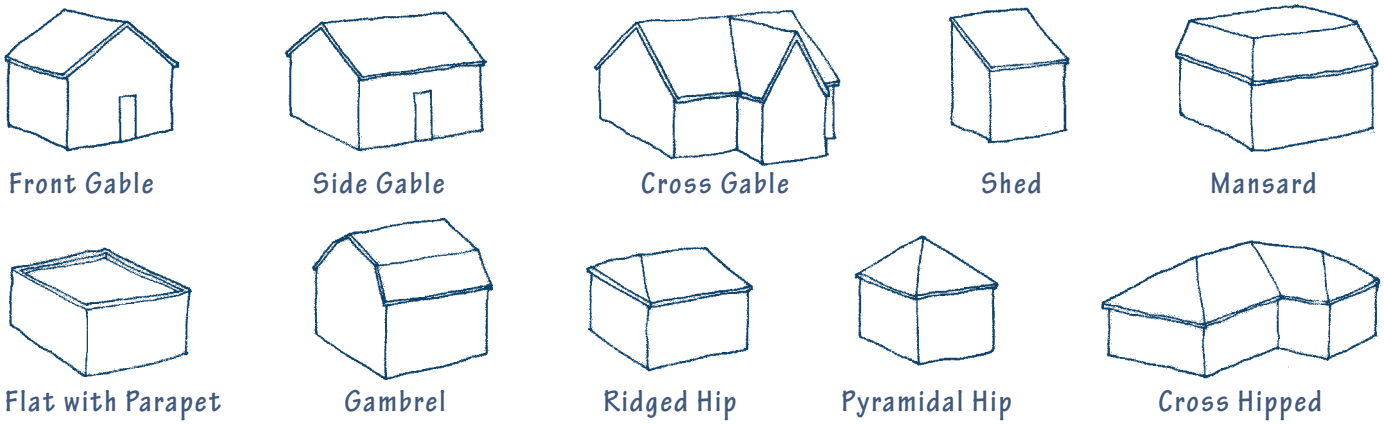
The form, materials and details of a roof can define a building's character and architectural style. Roofs also provide the first line of defense against the elements.

ROOFING MATERIALS

Historically, roofing materials were selected based upon practical and aesthetic criteria including pitch, weather conditions and the availability of materials and craftsmen. The popularity of architectural styles, from the use of wood shingles for Early Colonial and Federal style buildings to the use of slate for Victorian styles and masonry buildings, also had a great impact on the selection of roof material. With industrialization at the beginning of the 20th century, new roofing materials were introduced, including asphalt and asbestos-based shingles, as well as varieties of rolled or built-up roofing for flat installations. The variety of metal roofing expanded to include copper, tin and galvanized sheet steel. In addition, although less common in Portsmouth, terra cotta and concrete tiles were popular in different periods as well.

Each material provides a specific color, texture and pattern to a roof surface. Wood shingles and slate provide a modulated surface with variations in color, pattern, texture, veining, graining and thickness while metal roofing can provide a ribbed or smooth surface. Terra cotta and concrete tile may be appropriate materials as well.

More recently, a larger variety of substitute roofing materials intended to simulate historic materials has been developed, some more successful than others. These include architectural asphalt-composition shingles and fiberglass, metal, tile or recycled rubber shingles intended to evoke the appearance of slate, wood shingle and terra cotta.



HISTORIC CHARACTER OF ROOF FORMS

The historic form of a roof is critical to the understanding of a building's type and architectural style. Certain roof forms are linked with specific styles, such as Mansard roofs with Second Empire style. (Refer to *Guidelines for Architectural Styles*.) Alterations to a roof's shape can have a negative impact on the building's historic authenticity and appearance, and can lead to drainage problems or water infiltration. Roof forms can have various pitches and be combined in different manners to provide varied roof types. Some of the most common roof forms found in Portsmouth are illustrated above.

In addition to its role in defining a building type or architectural style, a roof's pitch or slope, as well as climatic conditions, such as snow loads and high winds, functionally define the appropriate materials for a roof. Low-pitched to flat roofs depend on a continuous or nearly continuous roof surface to minimize moisture infiltration, while moderately to steeply sloped roofs may be roofed with unit materials such as slate and wood shingles.

INVESTIGATING HISTORIC ROOFING

Some investigation may be needed to determine the historic sloped roof material for a building. A good place to start is in the attic. New roofs are often installed on top of older roof surfaces. Between rafters, older roofs can sometimes be seen. Another area of review is the roof framing, strapping and sheathing. Because of its weight, slate requires more substantial roof framing, with larger rafters and narrower spacing than wood shingle framing. If the original strapping is visible, there are variations in lath spacing that relate to standard sizes for slate, wood shingles and other materials. Finally, wood sheathing was often needed in metal and asphalt roof installations, while strapping or boards was used in wood and slate installations.

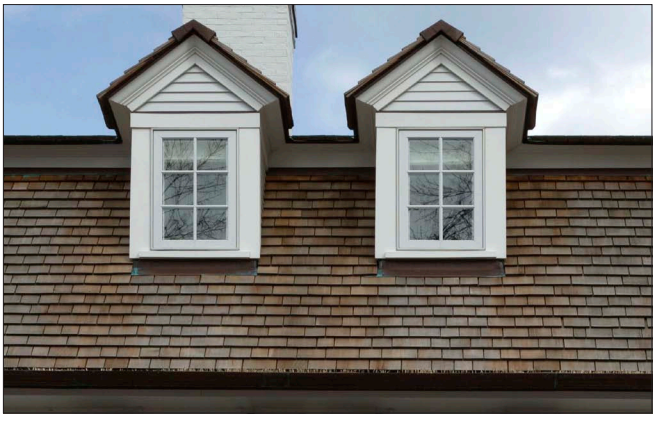
If physical evidence is not available, investigating documentary evidence such as historic photographs, speaking to neighbors or looking at similar buildings in the area might provide clues about original roof materials. Local resources such as the Portsmouth Athenaeum and the Strawbery Banke Museum can offer valuable sources.

WOOD

Wood shingles are typically made from cedar, cypress, redwood, oak, elm or white pine. While less common in Portsmouth today, historically they represented a common sloped roofing material for Colonial and Federal style buildings. A wood shingle roof can last 30 to 60 years depending on the roof pitch, quality of materials and installation. However, like all exterior wood installations, a shingle roof is subject to deterioration, rot, splitting, warping and eroding. In many cases, wood shingle roofs are replaced at the first indication of a localized problem, even when regular maintenance or a less intensive repair would be sufficient. Common locations of failure are at roof accessories including fasteners, flashings and gutters, which might have a shorter life span than the roofing surface. To extend the serviceable life of a roof, localized problems should be addressed as they become apparent.

Typical localized problems and possible repairs for wood shingles:

- Loosening or corroded fasteners for shingles or accessories – Reattach or replace fastener
- Split or punctured shingle – Install sheet metal under shingle, fill split or hole with roofing cement
- Missing or damaged shingles or roof accessories – Replace to match original
- Moss, algae or fungi on surface – Trim back adjacent trees allowing sun to dry out roof surface; investigate fungicide application; check attic for adequate ventilation



Wood shingles provide a unique texture on a roof surface.

SLATE

A slate roof can last 60 to 125 years depending on the roof slope, stone properties, installation quality and regularity of maintenance. Failing slate often slowly delaminates, chips and absorbs moisture, causing the deterioration process to accelerate over time. Problems with slate roofs are typically the result of localized failure, since many of the roof accessories and fasteners do not have the same 100-year life span as the slate itself. To extend the serviceable life of a roof, property owners are encouraged to address localized problems as they become apparent, using a qualified slate roofer.

Typical localized problems and possible repairs for slate:

- Loosening or corroded fasteners for slate or accessories – Reattach or replace fastener
- Split or cracked slate – Install sheet metal under shingle, fill split or hole with roofing cement
- Missing or damaged slates or roof accessories – Replace to match original

If over 20% of the roof slates are damaged or missing, replacement of the roofing might be warranted. In this case, property owners are strongly encouraged to make every attempt to match decorative patterns with replacement materials. When replacing sections of a slate roof, it may be possible to salvage and reuse some of the existing slate. Many imitation slate products have unknown reliability and lifespan, therefore, the HDC recommends retaining slate roofs or, if necessary, replacing them in-kind. It is critical to select a compatible flashing material and fasteners with a life span similar to or longer than the new roofing.

This Mansard roof includes a combination of fishscale and rectangular slates. It appears that the lower rows of slate have been replaced, likely as part of a repair of the gutter flashing below the dormer window. (The decorative balustrade has been removed.)

Three-tab asphalt shingles, as seen on this jerkin-head roof, are a relatively inexpensive roof material, but will require more frequent replacement than other materials.

ASPHALT

Asphalt became a popular roofing material at the beginning of the 20th century, providing a relatively inexpensive and easily installed roofing material. Early asphalt roofing was generally made of asphalt-saturated felts in a variety of shapes, styles, textures and colors. Today, asphalt shingles are made generally as 3-tab with fiberglass as a single layer of material, or architectural shingles, which include multiple layers of material with an appearance to simulate wood or slate.

An asphalt shingle roof can be expected to last from 15 to 30 years. Architectural shingles last longer due to their multiple layers. Over time, asphalt shingles can curl, lose their mineral coating, be dislodged by wind or become brittle.

Typical localized problems and possible repairs for asphalt:

- Split or puncture – Install sheet metal under shingle, fill split or hole with roofing cement
- Missing or damaged shingles or roof accessories – Replace to match original
- Moss, algae or fungi on surface – Trim back adjacent trees to allow sun to dry out roof surface

If over 20% of the asphalt shingles on a roof slope are damaged or missing, replacement of the roofing might be warranted. Property owners are encouraged to select asphalt colors that visually suggest the original roof material, i.e. weathered wood or slate, in shape, texture and pattern.

LIFE-CYCLE COST OF ROOFING MATERIALS

With regular maintenance, traditional historic roofing materials perceived as "more expensive" (such as slate) often have substantially longer lifespans than other forms of roofing. As a result, they do not require replacement as often and may have a lower life-cycle cost than less expensive materials such as asphalt. Full life-cycle costs are also key when considering a building's sustainability goals. **Overall, a material's longevity, sustainability and aesthetic qualities often add to a property's value.**

Standing seam metal roofing installations have a distinct pattern of regularly-spaced ribs, which result in regular shadow lines.

METAL

Metal became a popular material for roofing after sheet metal production was expanded after the mid-19th century, and can be found on commercial and industrial buildings, as well as some residences. Traditional sheet roofing metals include lead, copper, zinc, tin plate, tern plate and galvanized iron. Some metal roofs require regular painting to minimize the potential for corrosion. If painted, color should be appropriate to the building's architectural type and style and should have a matte or low-gloss finish. Traditional colors include silver, grey or green.

On shallow-pitch roofs such as those of porches, cupolas or dormers, small rectangular pieces of flat seam metal roofing were installed with edges crimped together and soldered to form a weather-tight surface. On steeper pitched roofs, long continuous seams were used, typically in a standing seam configuration, providing regular ridges down roof slopes. Corrugated or other paneled metal roofing can be found on some more utilitarian buildings and auxiliary buildings, such as sheds, boat houses and garages.

Deterioration of the metal surface tends to occur from wearing of the protective painted or galvanized surface, chemical action, rusting, pitting or streaking, airborne pollutants, rain or material acids or galvanic action. Galvanic action occurs when dissimilar metals chemically react with each other causing corrosion, and can result at adjacent dissimilar metals, such as fasteners or at non-adjacent metals (such as roof cresting), via rainwater. If the roof is generally rusting, splitting, pitted, severely buckled or warped, or many of the seams or edges are open or disfigured, replacement of the roofing might be warranted. If considering replacement, applicants are encouraged to make every attempt to match the material and seam patterns with the replacement material.

Typical localized problems and possible repairs for metal:

- Worn paint, galvanizing or coating – Repaint
- Slipping sheet, panel, open seam or open solder joint – Refasten and/or re-solder
- Isolated rusting or holes – Replace to match original

FLAT ROOFING SYSTEMS

Although very few roofs are truly "flat", low-sloped roofs, generally defined as a pitch less 3:12 (3-inch rise for 12-inch run), require a watertight roofing system. There are a variety of flat or low-slope roof systems including: metal roofing, built-up roofing, single-ply roofing, modified bitumen roofing, and green roof systems. By contrast, steeper pitched roof systems generally employ shingles that shed storm water.

Typical localized problems for flat roofs and possible repairs include:

- Splits, punctures or cracking of surface – Patch roof
- Standing water or poor drainage – Remove roof, taper substrate to drain and patch

Although uniformly flat roofs are less common in Portsmouth, areas of flat roofing are found in some historic roof forms such as mansard roofs. When selecting roofing materials, the materials and design should address the building's roof drainage and specific details of the existing conditions including attachment, substrate and weight limitations. The installation of light-colored roofing to minimize solar heat gain is permitted for multi-storied, flat-roof structures only when the surface is not visible from the public way. (Refer to *Roof Decks*, page 04-7.)

Flat roofs can also be an opportunity to utilize alternative energy technologies such as solar collectors and green roof installations. In exploring the use of alternative energy technologies in historic buildings, the HDC considers how proper installation and selection of systems can improve energy-efficiency without adversely affecting a building's historic character. This generally requires concealing these systems, as well as all building equipment, behind parapets where they are not visible from the public way. (Refer to *Roof Mounted Equipment*, page 04-9.)

Parapet: The portion of a wall that projects above an adjacent roof surface.

Cornice: The projecting horizontal moldings toward the top of the building wall at the roof edge.

Various chimney designs enhances the silhouette of the skyline. Chimney size and number of bishops caps suggest the number of fireplaces serving the rooms below.

CHIMNEYS

Chimneys were designed to complement the style of a building and period of construction. In Portsmouth, most are constructed of brick or masonry, some of which have been covered by stucco. The rhythm and placement of chimneys typically reflect the internal organization of a building and represent an important building feature. Most building types and styles have square or rectangular chimney shafts, sometimes with molded tops. Victorian period chimneys can include decorative detailing including corbelling, varied patterns, undulating and molded surfaces, and decorative terra cotta chimney pots. Though routine maintenance and repair of a historic chimney does not require a Certificate of Approval from the HDC, removal of historic chimneys is only approved by the HDC if they are structurally deficient. The use of veneer brick chimneys is only appropriate in unique circumstances and is discouraged.

DORMERS

Dormers, also known as dormer windows, were traditionally used to let light and ventilation into the attic and to create habitable space. At the exterior, they protrude from sloped roof surfaces and visually break up large roof surfaces. Dormers can have various roof shapes, but in the Portsmouth they typically have a gable, hip or shed roof form. Historically, the overall height and proportions of dormers is determined by the building style, with upper floors tending to have smaller windows than lower floors.

When considering a new dormer, particularly on historic buildings, property owners are encouraged to review historic dormers at comparable buildings of the same style and period. It is important to keep in mind a poorly scaled or detailed dormer can drastically change the appearance of an otherwise well-proportioned house and have an adverse impact on the architectural appearance.

Dormers are a common feature of Mansard roofs and can have highly decorative surrounds such as in this example.

NEW DORMER DESIGN PRINCIPALS

Design of appropriate dormers for historic buildings should follow these design principals:

- Dormers should be located on roofs with a minimum slope of 4” of rise in 12” of run, set back a minimum of 12” from the face of the wall below
- Dormers should not be visually overwhelming or exceed a third of the area of any roof slope, and individual dormers should appear as individual objects on the roof
- Small scale, single-window dormers are most appropriate for most historic buildings, and should be used for street-facing roof slopes
- Long shed-roof dormers should not be visible from any street and can include grouped windows, potentially separated by siding, shingles or stud pockets
- Dormer windows generally have vertically proportioned glass panes and shorter and narrower sash than windows at floors below – Required egress windows should be located at an inconspicuous gable end and not in a dormer or visible from the street
- Single window dormers should include a substantial casing and trim assembly extending from window to dormer corner edge, with the overall dormer width matching width of window openings below – Siding at the front face of a single window dormer is not appropriate
- Single window dormers should have a gable or hipped roof, with a slope matching the existing roof, or 5” of rise in 12” of run and deep eaves, with an overall width 25- to 40-percent larger than width of the dormer body – 45-degree dormer roof slopes are generally inappropriate
- Dormer eaves should be boxed-out or a wrapping cyma molding should be installed to make the dormer feel lighter – Avoid steep-pitched corona eaves and “pork chop” returns
- Dormer trim should be appropriate to building style – At the window head this can include the casing, a soffit and a corona or fascia – A cymatium or crown may be added on the raking cornice

Refer to *Guidelines for Small Scale New Construction & Additions* and *Guidelines for Commercial Development & Infill* for additional information.

Dormer Design, Ask the Following Questions:

- Does the overall width of the dormer (windows plus cheeks) match the width of the windows below?
- Do the cheeks look like a window casing or little walls?
- Do the sideboards follow the house roof slope?
- Is the dormer roof sensibly sized?
- Have you avoided pork chops?
- If a full cornice is used, does it have all of the right parts?

Roof features and accessories can dramatically alter a building's silhouette against the sky. This house has a gambrel roof that includes a cupola, a pair of brick chimneys and three pedimented dormer windows.

ROOF FEATURES & ACCESSORIES

Roof features are functional and sometimes decorative elements that define the profile of a roof against the skyline and should be appropriate to the building's style. Historic rooftop features include ridge caps, cresting, finials, roof hatches, flashing, gutters, downspouts, weather vanes and bell towers. More recent additions include skylights, solar panels and mechanical and television equipment. In its review of new roof features and accessories, the HDC considers the appropriateness to the building, existing features and accessories, level of visibility, as well as the visual impact to the roof character and appearance. Property owners considering installation of new roof features or accessories should make every effort to minimize their visibility and the appearance of clutter in order to improve the likelihood of approval.

This square cupola protrudes from the center of the roof of this former carriage house and includes windows on four sides. The cupola is topped by a weather vane.

Cupolas

A cupola, also known as a monitor or belvedere, is a structure that projects up from a roof, is used for ventilation with louvers, or as a lookout with windows. They are often found on agricultural buildings, such as carriage houses or barns to provide ventilation for the animals housed below, but they can also be found in urban areas as a decorative feature on an important residential, institutional or civic building.

DEFINITIONS

Bell Tower - A structure that typically projects up through a roof or an outside wall of a church building housing bells, with wall openings on the sides to let out the sound

Steeple - The top of a tower that diminishes in size in stages, often found at a church

Widow's Walk & Roof Railing

A widow's walk, also known as a captain's walk or roofwalk, is a roof platform, often accessed by a cupola, surrounded by a wood or iron railing. Although traditionally utilized for viewing ships at sea, they were often a decorative feature of the Italianate period, located on high-style residential or institutional buildings, and often accessed by a cupola. Similar to a window's walk which includes a platform, Portsmouth has some high-style Federal and Greek Revival buildings that have a roof railing, most often found along the transition from a low-pitch to a higher-pitch roofing surface or at the perimeter of a flat roofing surface.

Although widow's walks and roof railings are found historically at specific building types and styles, they do not necessary meet the requirements of a roof-deck railing. Therefore, it might not be safe to occupy the space. However, the HDC does not encourage the modification of a historic roof railing to provide code-compliant guardrails. In addition, in reviewing a new widow's walk or roof railing, the HDC considers the building's style and proposed design to determine whether it would be appropriate. The HDC generally does not approve the installation of a new widow's walk or roof rail at a historic building without appropriate documentation of a prior installation.

A widows walk or roof railing is generally located where there is a change in roof slope.

This roof deck, located on the rear wing of the house, is set back on one side and is minimally visible from the public way.

ROOF DECKS

A roof deck provides a space that can be occupied above a building's roof surface, and is more appropriate on flat or low-sloped roof surfaces where its visibility will be minimal from the ground. There are generally two types of roof decks, those that are:

- Tiled walking surface resting directly on the roof surface – Generally found at concrete slab construction
- Wood-framed structures raised above the roof surface by wood posts located around the perimeter of the deck – Generally found at roofs supported by wood rafters

When considering the installation of a roof deck, it is important to understand the building's structural system. The type and capacity of the structural system will:

- Identify whether surface paving or a raised deck is more appropriate
- Identify best post and attachment locations for raised decks
- Ensure the deck can be adequately supported by the building, i.e. tile flooring weighs substantially more than wood decking

In addition to understanding the appropriateness of a roof deck based upon its potential visibility, it is critical to ensure that the deck will not compromise the ability of the roof to perform its most critical function, keeping storm water out of the building. Prior to installing a deck:

- The weather-tightness of the roof should be confirmed as well as its anticipated lifespan – It is far more complex to address a leak in a roofing system if it is partially or completely obscured by a deck
- The roof pitch should be adequately sloped to the drains to prevent pooling on surfaces, particularly at tile roofs – Pooled water can migrate under tile through small mortar cracks, freezing and cracking tile in the winter
- An adequate weather-stop must be present at access door locations to prevent rainwater or melting snow from migrating into the building

Another potential concern with wood-framed decks is that because they are raised above the roof surface, they tend to be more visible from ground level, particularly as the roof below slopes to drain. This tends to be most problematic at roof slopes with greater pitches or slopes, and can result in the exposure of the deck framing from the ground if not sufficiently pulled back from the roof edge.

Typically, the most visible portion of a roof deck is the railing. Although the Building Code dictates the required height of railings, their visibility can be minimized if concealed behind a parapet or if they are located away from the outside building walls. In addition, the use of visually minimal railing materials such as metal and cable rail systems tends to be less prominent than wood railing.

This penthouse houses a stair to provide access to the roof, with the size minimized by the sloped roof form . The penthouse is held away from the roof edge, minimizing its visibility from the public way.

Rooftop Penthouse

A penthouse is a small addition on top of a roof providing access to a roof level, typically housing an access stair and/or an elevator, but not habitable rooms. Penthouses should be designed in a manner in keeping with the architectural qualities and materials of the existing building upon which it is located or as part of the overall design of a new building. In addition, penthouses should be located a minimum of 10-feet from outside building walls. (Refer to *Compatible Design Principles, Guidelines for Small Scale New Construction & Additions*, page 10-2.)

In some cases, it is not possible to access roof decks by penthouses and an exterior stair is preferred instead. In the same manner as decks, exterior stairs are subject to HDC review, and property owners are encouraged to minimize visibility of stairs and associated railings from the public way.

ROOFTOP ADDITIONS

In cases where a property owner is considering adding habitable space at the roof level, such as a bedroom, office, bathroom or kitchen facilities, it is considered a rooftop addition. Refer to the *Guidelines for Small Scale New Construction & Additions* for additional information regarding rooftop additions.

Stepped flashing is often installed in locations where a roof surface intersects a wall surface to prevent moisture from entering between the two surfaces.

Flashing

Flashing is typically made of thin sheet metal formed to prevent water from entering a building at joints, intersections and changes of pitch. It is installed around chimneys, parapets, dormer windows, roof valleys, vents and intersections of porches, additions and projecting bays. Flashing often fails before roof surfaces, particularly at more durable roofing such as wood shingles or slate. Failures result in interior leaks and deterioration of framing. If the flashing deteriorates, it is possible for a qualified roofer to replace it without replacing the entire roof.

When replacing flashing or installing a new roof, it is important to select a flashing material that has an anticipated life span similar to or longer than the roofing. Copper, terne, steel, lead, and aluminum are all used for flashing. The longevity of each material is based upon its thickness, its propensity for deterioration from environmental conditions, and whether it is galvanized, treated or coated. Generally, copper or lead-coated copper has the longest life span, followed by stainless steel, with aluminum being highly susceptible to punctures, tears and galvanic reaction with other metals and some roofing materials. It is important to verify that flashing materials are sympathetic and compatible with existing roofing materials, including fasteners, to prevent premature deterioration.

Snow guards can be highly decorative as in this Italianate example. The snow guards, located near the eaves, prevent snow from sliding off the roof surface, reducing potential damage to gutters.

Snow Guards

Snow guards are typically cast metal or bent wire devices arranged in a staggered pattern near an eave to prevent large masses of snow from sliding off a roof slope. Another form of a snow guard is spaced brackets supporting metal rods above the roof surface. Both types of snow retention can protect eaves, cornices and gutters, and take advantage of the insulating effect of snow.

Skylights & Roof Hatches

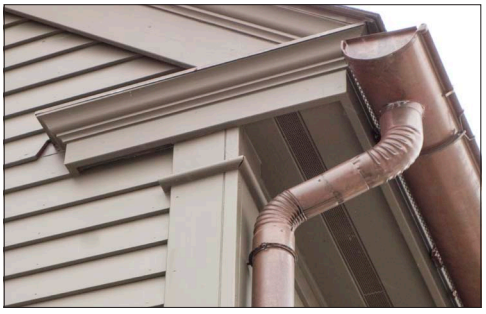
Skylights were historically used in commercial and warehouse buildings. Advancements in technology allowed them to be installed at residences. Similar in form to a skylight, a roof hatch can provide access to a roof for snow removal and maintenance, as well as provide a means of ventilating attic spaces. The installation of new skylights and roof hatches should minimize alteration of the roof structure with the long dimension oriented down the roof slope. Skylights and roof hatches should be hidden or minimally visible from public view, and should not disturb historic roof materials such as slate or terra cotta, nor require the significant modification of existing roof framing.

The skylight is installed at a rear elevation and is parallel to and only few inches above the roof surface. The glass and frame color are similar to the roof material, minimizing its visibility. Also note the snow guard.

Gutters

Gutters typically are located near or along the bottom edge of a roof slope to collect rainwater. Although many Portsmouth buildings were not designed with gutters, installing them can significantly reduce water damage to building walls and foundations. Built-in gutters are often not visible from the ground, and are typically within or behind architectural features such as cornices or parapets. Pole gutters are located near the bottom edge of a roof slope and project perpendicularly to the roof surface. Both built-in gutters and pole gutters are formed of flashing materials typically wrapped around or within wood enclosures.

Hanging gutters are located just under the roof slope edge and are usually metal with half-round or profiled cross sections. Gutter materials have different life spans. Generally, copper has the longest potential life span, followed by steel, with aluminum being highly susceptible to punctures, tears, dents and galvanic reaction to other metals. When installing or reinstalling gutters, property owners should reproduce any special or historic molding, strap or bracket used to support or attach a gutter to a building and repair or replace wood eave detailing and trim.



This copper gutter is located along the roof edge and is connected to the downspout with an elbow.

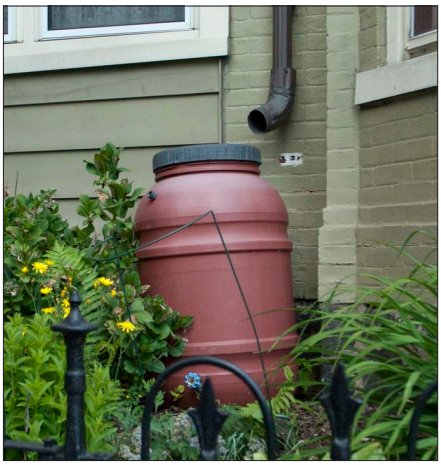
Downspouts direct storm water down the face of a building towards the ground. This example is encased in wood and includes an extension that discharges onto the driveway away from the foundation.

Downspouts

Downspouts, also known as rainwater conductors, conduct a gutter's water down the face of the building to the ground or a drainage system via a cast iron boot and are generally surface mounted to a building's exterior. Similar to gutters, downspouts can be fabricated of copper, galvanized metal or aluminum, in a round or rectangular profile. An advantage of a lead-coated copper or galvanized metal downspouts is that they can be painted to match the building colors.

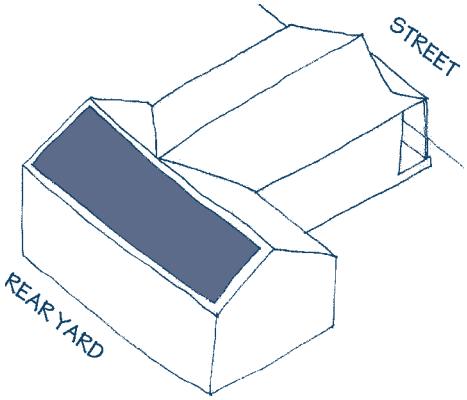
When adding downspouts to a structure for the first time, they should be arranged in an orderly fashion and mounted to the building rather than a porch post or column.

Rain barrels can collect storm water for future use in the garden, reducing run-off into the river. Property owners are encouraged to select neutral colors and shield rain barrels from public view with plantings to the extent possible.



Green Roofs & Rain Barrels

Much of the rain that falls on a roof surface is typically diverted to a gutter, then a downspout, and from there, discharged at the perimeter of a building or into a storm sewer. Reducing the amount of water that reaches the gutter or collecting the water as it is discharged from the downspout, prevents the soil around a building from becoming saturated, potentially impacting the foundation. In addition the sewer system is less likely to become overwhelmed in a significant storm. One of the means of controlling the quantity of water diverted to a gutter system is installing a green roof so that the planted material is not visible from the public way. An option for flat and sloped roofs is installing rain barrels at the bottoms of downspouts. Rain barrels collect storm water discharged from downspouts. They typically include a spigot near the bottom for a hose hook-up, allowing the collected storm water to be used for watering gardens and lawns.



Placement of roof-mounted equipment, solar collectors, wind turbines, skylights and roof hatches is encouraged facing a rear yard wherever possible. If it is not possible, placement as far back on a side roof slope as possible is preferred.

ROOF MOUNTED EQUIPMENT

Roof mounted equipment including mechanical equipment, vents, television dishes and antennae and mobile telecommunication equipment are all examples of modern mechanical equipment and roof penetrations that can affect the historic integrity of a building. Although it is understood that some roof penetrations are required for items such as plumbing vents, property owners are encouraged to limit the amount of rooftop equipment and penetrations, and minimize the overall appearance of clutter. For more information on additions that change the appearance of an existing roof, refer to the *Guidelines for Small Scale New Construction & Additions*.

RENEWABLE ENERGY

Solar collectors provide a renewable energy source. The City of Portsmouth encourages solar collectors for space heating, hot water and electricity. However, property owners are encouraged to locate solar collectors where they are hidden or minimally visible from public view. To minimize their visibility, the frame and panels should be the same color as the roof structure, and located parallel to and as close to the roof structure as possible. The proximity and seasonal shading characteristics of adjacent and neighboring trees and structures should also be considered to ensure sufficient year-round solar exposure to justify the expense of installation. (Refer to Roof-Mounted Equipment diagram above for placement.)

Similarly, wind turbines are a renewable energy source. However, because turbines need to be located to benefit from consistent breezes, they are often taller than adjacent buildings and highly visible. Similar to solar collectors, the visibility of wind turbines should be minimized from public view.

An "invisible" form of renewable energy is geothermal heating and cooling. Geothermal systems use the thermal energy generated and stored in the earth to heat/cool a building through a series of pipes bored into the ground. Typically, the only component of the system that is visible at the exterior of a building is a valve access cap, generally located flush with the ground.

Roof forms, features and elements, including chimneys, steeples and firewalls, define the skyline of Portsmouth.

ROOF SYSTEMS & STORM PREPAREDNESS

Some of the greatest damage to buildings during major storms, such as winter nor'easters and Atlantic hurricanes, generally occurs as a result of high winds that compromise the roof system by uplift, causing the entire roof or roof components such as slates to blow off. Although some preventative measures can be taken to existing roof systems, some improvements cannot be completed unless a new roof is installed or an existing roof replaced.

Storm preparedness options for roofs include:

- Adding bracing or additional structural elements to roof framing and gable ends – *Consultation with an architect or engineer might be required*
- Strengthening connections between roof framing elements using hurricane straps, clips, sheathing attachments, etc. – *Consultation with an architect or engineer might be required*
- Repointing chimneys with mortar
- Fastening gutters, downspouts and snow guards securely to building
- Verifying connectors at roof decks are secure and moving all furnishings to the building's interior
- Ensuring all roof mounted equipment is securely fastened and will not become airborne
- Installing a secondary roofing system such as self-adhered roofing applied to plywood under wood shingles with a breather system, beneath slate, tile or metal roofing in case the primary roof is damaged – *Verify material installation requirements for primary roofing*
- Sealing and protecting skylights, cupolas, roof vents, including gable-end vents, and roof hatches prior to a storm to minimize wind-driven rain and uplift damage
- Installing metal roofing and flashing with double-lock seams and edges and closely spaced, high-strength fasteners
- Avoiding gravel or other loose material on rooftops that could become airborne in the event of a storm
- Reviewing the underside of roofs from attic for visible signs of moisture or daylight indicating potential cracks or holes, paying particular attention at roof penetrations such as chimneys and vents
- Installing ice and water shields along roof edges and changes in slope such as ridges and hips

HDC CRITERIA FOR ROOF REVIEW

When evaluating a proposed repair, modification or replacement of a historic roof, chimney, dormer or roof feature, the HDC's goal is to preserve the integrity of the remaining historic fabric in Portsmouth's Historic District to ensure continued access to this shared heritage. One of the major factors in the review process is the property's historical and/or architectural value as determined by the historic designation. The more significant the property, the more critical its authenticity.

- **Focal Properties** — Maintain the highest historic integrity with restoration of historic roofs and associated features or replacement in-kind throughout
- **Contributing Properties** — Restoration of historic roofs, chimneys, dormers and roof features is encouraged, particularly at street-facing facades, with more flexibility possible at secondary elevations with limited visibility from the street
- **Non-Contributing Properties** — Restoration of historic roofs, chimneys, dormers and roof features is encouraged, with greatest possibility for flexibility for alterations, particularly at secondary elevations
- **New Construction & Additions** — Roof forms appropriate to the architectural style and compatible to adjacent construction is encouraged, with the screening of all rooftop amenities and amenities from the public right-of-way

When considering substitute materials, care is recommended since they might not have the longevity advertised, may not be appropriate for weather conditions and can potentially damage historic building fabric.

When is HDC Review Not Required?

A Certificate of Approval is not required for:

- Ordinary maintenance and repair of a fire wall or chimney in-kind, including design and materials
- Re-roofing of a building or structure while maintaining the roof plane and material regardless of color
- Roof mounted equipment on a single-family or two-family residence where the equipment is not visible from the public way, is less than 27 cubic feet, and does not extend more than 3-feet above the roof surface
- Construction of chimney caps or bishop pots in masonry or bluestone, or constructed of another material with a black, dark brown or copper finish

HDC CRITERIA FOR ROOF REVIEW (CONTINUED)

Roof Form

The HDC recommends:

- Maintaining a building's roof slope appropriate to the architectural style at primary and ancillary structures
- Designing new buildings with a roof slope similar to existing buildings on a site and neighboring construction (Refer to *Compatible Design Principles, Guidelines for Small Scale New Construction & Additions*, page 10-2)

The HDC strongly discourages:

- Avoiding overlapping gables unless the smaller gable is part of a balcony, porch or entrance or in the rare case where it is appropriate to the style
- Modification of the roof plane for the installation of insulation or any other purpose

Wood Roofing

The HDC recommends:

- Localizing repairs rather than fully replacing historic material where possible; addressing localized issues as they arise to avoid larger-scale problems
- Matching the shape and pattern of the historic material when repairing or replacing wood shingles
- Installing weathered wood colored architectural shingles, when replacement with wood is not feasible
- Selecting compatible flashing material and fasteners with a lifespan similar to the new roofing
- Keeping nearby vegetation trimmed away from the roof to avoid issues with moisture damage

The HDC strongly discourages:

- The permanent removal of wood shingle roofs

Slate Roofing

The HDC recommends:

- Localized repairs rather than fully replacing historic material where possible; addressing localized issues as they arise to avoid larger-scale problems
- Matching the color, shape, texture and pattern of the historic material when repairing or replacing slate
- Matching appearance of historic material with substitute materials, such as slate imitation products or architectural or commercial-grade, asphalt shingles in slate color, shape and pattern, when replacement with slate is not feasible
- Using care to select compatible flashing material and fasteners with a lifespan similar to the new roofing

The HDC strongly discourages:

- The permanent removal of slate roofs

Asphalt Roofing

The HDC recommends:

- Matching the color, shape, texture and pattern of original historic material when repairing or replacing asphalt shingles (Refer to *Investigating Historic Roofing*, page 04-2)
- Keeping nearby vegetation trimmed away from the roof to avoid issues with moisture

Metal Roofing

The HDC recommends:

- Matching material, color, seam patterns and edge and ridge details of historic metal when replacing or repairing metal roofing to be sympathetic to the existing building, while minimizing joints and potential glare
- Using flashing with a lifespan compatible to the roofing material to avoid need for premature repairs
- Considering the level of visibility and location of roofing when evaluating substitute materials
- Using metal roofing panels that are flat between the primary ribs, with no striations or pencil ribs
- Installing bubbled ridge caps with metal roofing, or standing seam ridge caps with the lowest profile possible
- Minimizing the use of pre-manufactured metal roof details including ridge, hip and roof edges

Flat Roofing Systems

The HDC recommends:

- Installing historically appropriate roofing, including material and color, at all visible roof surfaces
- Installing a roof system that is appropriate for climatic conditions and snow loads
- Ensuring the roof is installed with an adequate slope to drain
- Installing light-colored roofing to minimize solar heat gain where not visible from the public way
- Using alternative technologies, when appropriate, in areas that are not visible from the public right-of-way and do not adversely impact the appearance, structure or moisture-performance of a historic structure

Chimneys

The HDC recommends:

- Retaining and properly maintaining historic chimneys and detailing, even in instances where the interior of the chimney has been removed
- Placing new chimneys in a location appropriate to the building's architectural style, with a brick, stone or stucco finish if visible from the public way – Clad metal flues in brick, stone or stucco for a historic appearance
- Detailing chimneys with the height, spacing and materials appropriate to the building style and to meet code requirements
- Installing a dark colored projecting chimney cap
- Extending to the ground chimneys on outside building walls
- Installing flue extensions of clay tile or galvanized metal left natural or painted black

The HDC strongly discourages:

- Replacing a historic masonry chimney with a framed chimney covered with brick or stone veneer
- Removing or relocating exterior portions of historic wood or gas burning chimneys
- Using a cantilevered stack emerging from the outside wall of a house for a gas-stove or fireplace

HDC CRITERIA FOR ROOF REVIEW (CONTINUED)

Dormers

The HDC recommends:

- Maintaining existing dormers
- Reconstructing missing dormers with documentation
- Constructing a new dormer that is appropriate for the architectural style of the building (Refer to *New Dormer Design Principals*, page 04-5)
- Constructing a new dormer that is located in a way that is logical for and proportionate to existing architectural style – with attention to size, location, rhythm, spacing, symmetry and materials

The HDC strongly discourages:

- Covering the roof almost entirely with dormers
- Large dormers that cover most of the roof
- Oversized dormers that are wider than the window(s) below
- Using a 45-degree roof pitch on a dormer
- Wide cheek walls
- Pork chop returns
- Roof slopes less than 4" of rise in 12" of run
- Extending the dormer to the face of the wall below
- Siding anywhere above the window head except in the tympanum or pedimented portion of a gable-front dormer

Widow's Walk & Roof Railing

The HDC recommends:

- Maintaining historic widows walks and roof railings - Refer to *Guidelines for Exterior Woodwork*
- Regular repainting of wood components - Refer to *Exterior Paint, Guidelines for Exterior Maintenance*, page 03-14

The HDC strongly discourages:

- Installing a widow's walk or roof railing where it did not exist historically

Cupola

The HDC recommends:

- Maintaining historic cupolas - Refer to *Guidelines for Exterior Woodwork* and *Guidelines for Windows & Doors*

The HDC strongly discourages:

- Installing a cupola where it did not exist historically

Flashing

The HDC recommends:

- Installing any new or replacement flashing with a life span longer than or equal to the life span of the roof material
- Installing flashing compatible with all roof materials

Snow Guards

The HDC recommends:

- Retaining original snow guard system and appearance

Gutters

The HDC recommends:

- Retaining original gutter system and appearance
- Replacing gutters with new material of similar size, shape texture, and pattern if replacement with original material is not possible
- Installing plain half-round, painted K- or ogee gutters
- Cleaning gutters regularly, typically each spring and fall
- Anchoring gutters securely to minimize snow and ice damage

Downspouts

The HDC recommends:

- Retaining original downspout or, if necessary, replacing with new of similar size, shape, texture and pattern
- Painting of downspout to match adjacent wall color
- Cleaning regularly, typically each spring and fall

Roof Decks & Penthouses

If considering a roof deck, the HDC encourages:

- Locating roof decks on flat, or low-sloped roof surfaces, preferably behind a parapet
- Installing roof decks in a manner that does not damage historic building materials
- Concealing deck framing, railing, roof decks and other non-movable furnishings from the public right-of-way
- Minimizing the size of the penthouse for required stair and/or elevator access
- Selecting exterior materials for roof decks that minimize their visual prominence
- Minimizing visibility of exterior stairs

Roof Mounted Equipment

The HDC recommends:

- Installing solar collectors in a manner that is not visible from the public right-of-way
- Replacing existing or installing a new skylight or roof hatch with components that are relatively flat, minimally visible, sympathetic to and compatible with the existing roofing materials
- Minimizing the visibility of all rooftop equipment from the public way including mechanical, television and telecommunications equipment

The HDC discourages:

- Installing new roof mounted equipment in a manner that is visible from the public right-of-way or visually prominent or highly reflective equipment

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