

City of Newton Historic Preservation

GUIDELINES FOR ROOFING



The front gable roof on this relatively modestly scaled house in Auburndale includes distinctive alternating bands of standard and diamond-shaped slates. The vergeboard along the gable-end includes a decorative paneled motif with circular cut-outs.

PURPOSE

These *Guidelines* were prepared to provide property owners with information when considering the repair, alteration or installation of roofing. They are not intended to replace consultation with qualified architects, contractors, the Newton Historical Commission (NHC), Local Historic District Commissions (HDC) and their Staff. The City's Preservation Planner and the NHC/HDC will be happy to provide a preliminary consultation addressing design or materials issues to potential applicants free of charge.

These Guidelines were developed in conjunction with the City of Newton's Historical Commission (NHC), Local Historic Districts Commissions (HDC), and the Planning and Development Department (PDD). Familiarity with this material can assist owners of designated historic properties to move a project quickly though the City of Newton review and approval process. Information pertaining to all properties with a City of Newton historic preservation review designation is marked with the abbreviation (ALL). Information pertaining specifically to properties in Local Historic Districts (LHD), to Local Landmarks (LL), or to properties with Preservation Restrictions (PR) is marked accordingly. Information in the Guidelines that is advisory only is marked with the abbreviation (AO). Please refer to the Introduction section for background information on historic preservation designations and the project review process in the City of Newton.

Additional Guidelines addressing other historic preservation topics are available at City Hall and on the City's website at www.newtonma.gov. The NHC, HDC, and PDD are available to provide informational meetings or preliminary consultation with applicants prior to filing. For more information, questions regarding the application process, or to clarify whether a project requires review please contact the PDD at (617) 796-1120.

ROOFS

A building's roof provides the first line of defense against the elements, and its design greatly affects the overall appearance of a building. Therefore, the following functional and aesthetic concerns should be considered when considering roof alterations:

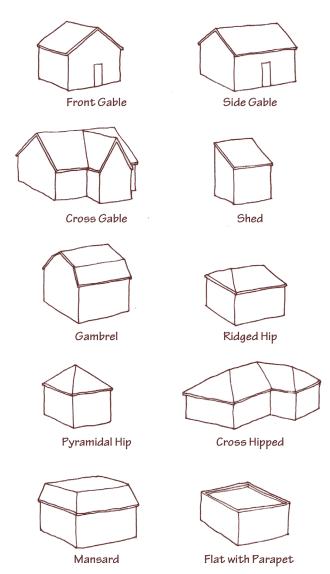
- Weather-tight roofing preserves a building and provides shelter from rain, wind, sun and snow
- Roofing helps define the building's character, silhouette and architectural style
- The form, color and texture of roofs and roof penetrations affect the scale and massing of the building
- Roof variations add visual interest to the streetscape



The complex roof form of this Queen-Anne home in the Newtonville Historic District is an important element of the streetscape and adds to the character of the neighborhood.

HISTORIC CHARACTER OF ROOF FORMS

The historic form of a roof is critical to the understanding of a building's type and architectural style. Alterations to a roof's shape can have a negative impact on the building's appearance. Roof forms can have various pitches and be combined in different manners to provide numerous roof types. This is particularly true of Victorian-era buildings which often have complex roof forms with intersecting gables, hips and towers. Some of the most common basic roof forms found in Newton are illustrated below.



ROOF PITCH AND MATERIALS

The pitch or slope of a roof helps define the appropriate materials for the roof. Low-pitched to flat roofs depend on a continuous roof surface to minimize moisture infiltration. Material options for low-pitched roofs include built-up hot tar roofing; roll roofing such as EDPM; and soldered flat-seam metal. Possibilities for moderately to steeply sloped roofs include unit materials such as slate, terra cotta, concrete, wood shingles, metal shingles and asphalt shingles.

ROOFING MATERIALS

Historically, roofing materials were selected based upon practical and aesthetic criteria including pitch, weather conditions and availability of materials and craftsmen.

In Newton, existing historic roof materials are generally slate, terra cotta and, less frequently, wood shingles. Later roofs are often covered with asphalt shingles. Each material provides a specific color, texture and pattern to a roof surface. Slate and wood shingles provide a modulated surface with variations in color, texture veining or graining and thickness. Decorative slate shingles were also used, particularly in the Victorian-era during the second half of the 19th century, to add additional colors or shapes to roof surfaces.

With industrialization at the beginning of the 20th century, new roofing materials were introduced, including asbestos and asphalt based shingles, as well as varieties of rolled or built-up roofing for flat installations. The variety of metal roofing was also expanded, including copper, galvanized sheet steel and aluminum. In addition, the early 20th century included an expanded use of terra cotta tile and later concrete tile, particularly in revival styles of architecture.

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

INVESTIGATING HISTORIC ROOFING

Some investigation may be needed to determine the historic 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. By looking between rafters, older roofs can sometimes be seen. Another area of review is the roof framing, lath and sheathing. Because of their weight, slate and terra cotta require more substantial roof framing, with larger rafters and narrower spacing than wood shingle framing. If the original lath is visible, there are variations in lath spacing that relate to standard sizes for slate, terra cotta, concrete and wood shingles. Finally, wood sheathing was often needed in metal roof installations, while lath was used in shingle installations. If physical evidence is not available, documentary evidence such as historic photographs, speaking to neighbors or looking at similar buildings in the area might provide clues about original roof materials.

SUBSTITUTE MATERIALS

Care is recommended when using substitute materials since they might not have the longevity advertised, can potentially damage historic building fabric, and may not meet the Secretary of the Interior's standards.



Roofs can be a prominent feature of a building, with slate providing a distinctive and modulated color, veining and texture.

SLATE (ALL)

A slate roof can last 60 to 125 years depending on the roof slope, stone properties, formation, 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 corrosion of 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. Imitation slate products have unknown reliability and lifespan and the NHC/HDC recommend retaining slate roofs or, if necessary, replacing them in-kind. It is critical to select a flashing material with a life span similar to or longer than the new roofing.

LIFE-CYCLE COST OF ROOFING MATERIALS

With regular maintenance, roofing materials perceived as "more expensive" (ie, slate, terra cotta and concrete roofing) often have a substantially longer lifespan than other forms of roofing. As a result, they do not require replacement as often and may have a lower life-cycle cost than cheaper materials such as asphalt. This longevity and the material's aesthetic qualities often add to a property's value.

TILE (ALL)

A tile roof, including terra cotta and concrete tiles, can last over 100 years depending on the material's properties, the manufacturing process, installation quality and regularity of maintenance. Similar to slate, problems with tile 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 tile itself. In addition, the tiles are relatively fragile and susceptible to damage from falling tree limbs and other impacts. To extend the serviceable life of a roof, property owners are encouraged to address localized problems as they become apparent, using a qualified roofer.

Typical localized problems and possible repairs for tile roofing:

- Loosening or corrosion of fasteners for tiles or accessories - Reattach or replace fastener
- Cracked tile Install sheet metal under tile, fill split or reattach dislodged piece with tinted roofing cement
- Missing or damaged tile or roof accessories Replace to match original, preferably with salvaged units with the same dimensions and similar visual characteristics

If over 20% of the tiles on a roof slope 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 shapes and patterns with replacement materials. Other materials are used to simulate terra cotta, concrete or other tiles, but many do not have the same dimensional characteristics of the historic material or have not been available commercially for very long. It is often possible to reuse salvaged tiles taking care to verify availability of appropriate quantities of needed sizes and shapes. When replacing a roof, select a flashing material that has a life span similar to or longer than the roofing.



Tile roofs can often last as long as slate roofs, and contribute greatly to the character of buildings such as this historic home.

METAL (ALL)

Metal became a popular material for roofing after sheet metal production was expanded following the mid 19th century, and can be found on commercial and industrial buildings, as well as residences and outbuildings. Traditional sheet roofing metals include lead, copper, zinc, tin plate, tern plate and galvanized iron. Some metal roofs require regular painting, with traditional colors including silver, grey or green, to minimize the potential for corrosion.

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 was also common on commercial and industrial buildings as well as outbuildings, such as sheds 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 against each other and corrode, and can come from adjacent metals, such as fasteners or 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



Metal standing-seam roofs were popularized in the mid-19th century. Decorative or unusually shaped roof elements, such as this cupola, were often covered with metal roofing.



Wood shingle roofs can be applied in a variety of decorative patterns and configurations. This example includes alternating rows of scalloped and square-butt shingles.

WOOD

Wood shingles are typically made from cedar, cypress, redwood, oak, elm or white pine. While uncommon in Newton, historically they represented a common sloped roofing material.

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 the roof accessories including the fasteners, flashing and gutters, which might have a shorter life span than the roofing surface. To extend the serviceable life of a roof, property owners are encouraged to address localized problems as they become apparent.

Typical localized problems and possible repairs for wood shingles:

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

METAL ROOFING COLOR (LL, PR)

Metal roof colors in Newton tend to be natural metal or natural copper, or if a painted finish is desired, colors such as red, silver to grey or muted green. Red metal roofs are most commonly found at secondary buildings and at porch roofs.



Asphalt shingles are a common 20th century building material, for both roof replacement and new construction.

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 with fiberglass, generally as 3-tab, "architectural" or "dimensional" shingles, which include multiple layers of material with simulated shadows suggesting wood or slate.

An asphalt shingle roof can be expected to last from 15 to 25 years with "architectural" or "dimensional" shingles lasting 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 (ALL)
- Missing or damaged shingles or roof accessories Replace to match original (ALL)
- Moss or fungi on surface Trim back adjacent trees to allow sun to dry out roof surface (AO)

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 replace historic asphalt shingles in-kind (ALL).



Asbestos roofing shingles came in various shapes, with diamondshaped being the most common. This asbestos roof has some non-asbestos replacement shingles of similar size and shape as the existing roofing.

FLAT ROOFING SYSTEMS (AO)

Although very few roofs are truly "flat", low-sloped roofs, generally defined as a pitch less 3:12 (3" rise for 12" 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, and modified bitumen roofing. By contrast steeper pitched roof systems generally employ shingles that shed storm water.

Typical localized problems for flat roofs include:

- Splits, punctures, or cracking of surface
- Standing water or poor drainage

Although flat roofs that are not visible from a public way are often not subject to NHC and HDC review, it is recommended when selecting roofing materials that the materials and design address the building's 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 also recommended.



Flat roofs with parapets are frequently found on commercial or institutional buildings

ASBESTOS (ALL)

Asbestos became a popular roofing material at the beginning of the 20th century. Asbestos roofing is made from asbestos mineral fibers and either Portland or hydraulic cement and it provides a durable, lightweight, economical, fireproof, rot and termite resistant alternative to slate, terra cotta and concrete tile roofing.

With appropriate maintenance, an asbestos shingle roof can be expected to last well over 30 years, with cracking and rusting nails being the most typical cause of failure. However the manufacturing of asbestos roofing essentially ceased when asbestos was banned by the EPA in 1973. If the roofing is damaged, consultation with a professional to determine whether repair is feasible is recommended. If considering replacement, visually similar shingles, without the presence of asbestos, or asphalt shingles are recommended.

ASBESTOS SHINGLE REPAIR / REMOVAL

Great care should be taken when working with broken asbestos products and during their removal. It is recommended that all asbestos related work be undertaken by a licensed contractor.

Property owners are responsible for ensuring that all asbestos removal and disposal is handled in accordance with all applicable regulations and procedures, including Inspectional Services and Health Department regulations.

ROOF ACCESSORIES (ALL)

Added to the roofing surface, roof accessories are both functional and influence a roof's appearance. Roof accessories include flashing, snow guards, gutters and downspouts.



Flashing is commonly found at chimneys, dormers and intersections of roof forms.

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 typically installed around chimneys, parapets, dormer windows, roof valleys, vents and intersections of porches, additions or bay windows. Flashing often fails before roof surfaces, particularly with more durable roofing such as slate, resulting in interior leaking. If the flashing deteriorates, it is possible to replace it without replacing the entire roof.

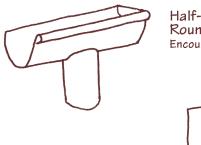
When replacing flashing or installing a new roof, it is important to select a flashing material that has an anticipated life span similar or longer than the roofing. Copper, terne, steel, lead and aluminum are all used for flashing. The longevity of each material is based upon its thickness, its propensity for deterioration from environmental conditions, and whether it is galvanized, treated or coated. Generally, copper or lead-coated copper have the longest life span, followed by 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.

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. Another form of a snow guard is spaced brackets supporting metal rods above the roof surface. Both types of snow retention can protect eaves, cornice and gutters, and take advantage of the insulating effect of snow.

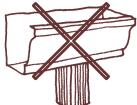
Gutters are typically located near or along the bottom edge of a roof slope to collect rainwater. Built-in gutters are hidden from view from the ground within or behind architectural features such as cornices or parapets. Pole gutters are located near the bottom edge of a roof slope and project perpendicularly to the roof surface. Built-in gutters and pole gutters generally include flashing materials typically wrapped around or within wood forms.

Hanging gutters are attached to the building just under the roof slope edge and are half-round or profiled in cross section. Hanging gutters are typically made of wood, copper, galvanized metals, aluminum and recently vinyl. Wood gutters often include flashing lining the form, offering the longevity and maintenance advantages of metal gutters.

Similar to flashings, gutter materials have different life spans. Generally, copper has the greatest potential longevity, followed by steel, with aluminum being highly susceptible to punctures, tears, dents and galvanic reaction to other metals. Vinyl gutters can become brittle, fracturing in low temperatures. The longevity of wood gutters is determined by the material and quality of the flashing; with proper maintenance wood gutters can last for many years. Wood gutters often contribute to the exterior appearance of a building, and should be retained or replaced in-kind.



Half-Round Gutter, Round Downspout Encouraged



K-Style Gutter, Corrugated Downspout Discouraged

Downspouts, also known as rainwater conductors, are generally surface mounted to a building's exterior to conduct water from a gutter to the ground or an underground drainage system. Similar to gutters, downspouts can be fabricated of copper, galvanized metal, aluminum and vinyl with similar characteristics, in a round or rectangular profile.



Snow guards come in a variety of types and styles, as seen on this roof. Also note the standing-seam metal roof with copper gutters, downspouts and decorative copper scuppers.

HISTORIC ROOF FEATURES

Roof features are decorative and sometimes functional elements that help to define the profile of a roof against the skyline and should complement the building's style. Historic rooftop features include chimneys, dormers, cupolas, bell towers, turrets, finials, cresting and weathervanes.

Chimneys were typically designed to complement the style of a building and period of construction. In Newton, many are constructed of brick, and less commonly stone, some of which have been covered with stucco. Most styles of building, including Colonial Revival and Classical Revival buildings, tend towards square or rectangular chimney shafts, sometimes with molded caps. Victorian-era and Tudor-revival chimneys can include decorative detailing including corbelling, varied patterns, molded surfaces and decorative chimney pots.



Chimneys can range from simple forms to the complex as seen in this pairedshaft, corbelled brick chimney.

Dormers, also known as dormer windows, protrude from the roof surface with a window at the downward slope, providing light and additional headroom under the roof. Dormers can have various roof shapes, including gables, shed, hipped, eyebrow and segmented pediment. For more information on dormers, refer to the *Guidelines for Additions* & New Construction.



Dormers can be a significant character-defining element of a historic house. Gambrel roofs typically have dormers to increase habitable space at upper floors.

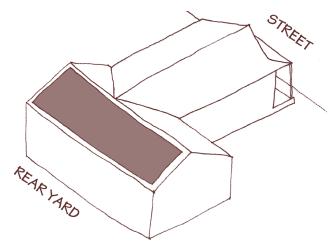
Cupolas, also known as monitors or belvederes, are structures that project up from the roof, used for ventilation with louvers, or as lookouts with windows. They are often found on agricultural outbuildings to provide ventilation for the animals housed below, but can also be found in urban areas as a decorative feature on important residential, institutional or civic buildings.

ROOF MOUNTED EQUIPMENT / ADDITIONS (ALL)

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 Additions & New Construction*.

Solar collectors provide a renewable energy source. Newton 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. Refer to the *Guidelines for Sustainability* for additional information.

Skylights are sometimes historically found in commercial buildings. The installation of new skylights should minimize alteration of the roof structure with the long dimension oriented down the roof slope. Skylights should be hidden or minimally visible from the public view, and should not disturb historic roof materials such as slate or terra cotta.



PREFERRED LOCATION FOR ROOF MOUNTED EQUIPMENT / ADDITIONS (ALL)

- The NHC/HDC encourage the placement of all dormers, additions and roof mounted equipment (including mechanical equipment, vents, television dishes, solar collectors and skylights) in a manner that is as visually unobtrusive as possible.
- Placement facing a rear yard, wherever possible, is encouraged. If it is not possible, placement as far back on a side slope as possible is preferred.
- Applicants are encouraged to install skylights and solar collectors so that they are parallel to the roof surface and do not extend more than 8 inches above it.

ROOF REPAIR OR REPLACEMENT

The NHC/HDC encourage:

- Retaining original drainage system and appearance (ALL)
- Installing half-round gutters rather than a profiled K-gutter, which often competes with building features (ALL)
- Installing plain round or rectangular downspouts in lieu of corrugated downspouts (ALL)
- Selectively replacing damaged or missing elements inkind, so as to match the material, size, shape, texture, and other visual characteristics of the original (ALL)
- If the level of damage or deterioration is beyond repair, completely replacing damaged or missing materials in-kind to match the material, size, shape, texture, pattern, and other visual characteristics of the original (ALL)
- If replacement in original material is not possible, replacing the damaged or missing materials with new modern material of similar size, shape, texture, pattern and other visual characteristics of the original (ALL)
- Installing roofing rather than typical wall materials on the steep slopes of mansard roofs (ALL)
- Maintaining, cleaning or repairing of roofing, roof accessories and rooftop features (AO)
- Securely installing fasteners and flashings with a similar expected life span to the roofing material (AO)
- Regular repainting of metal components susceptible to rusting and wood elements susceptible to rot and deterioration (AO)
- Cleaning of gutters and downspouts regularly, typically every spring and fall (AO)
- Inspecting of attics periodically after a storm or freeze to catch small leaks early to minimize the potential for interior damage (AO)

The NHC/HDC discourage (ALL):

- Removing or altering historic drainage systems
- Removing roof features such as chimneys, dormers, cupolas, weathervanes, finials, etc.
- Adding or altering rooftop features or equipment at areas visible from a public way that change roof configuration including skylights, television antennas or dishes, solar collectors, mechanical equipment, roof decks, chimney stacks and dormer windows
- Adding rooftop features that create a false historical sense without supporting documentary evidence such as weathervanes, cupolas or wood shingles on an originally slate roof



Overall roof form, detailing and historic roof features are an important element of many of Newton's historic homes, such as this example in Auburndale.

- Adding new features that are out of character, scale, materials or detailing to the historic building
- Encapsulating decorative wood elements such as cornices and brackets with vinyl or aluminum capping or siding

ADDITIONAL AREAS OF CONSIDERATION (AO)

- Roofing work is potentially dangerous and should be left to professionals
- All roofers are not experienced in all materials; obtain references and verify that roofers have appropriately completed compatible work
- Verify the extent of both the material and installation warranties and company histories
- Verify whether removal of existing roofing is required before installation of new roofing; too much weight can damage structural elements
- Verify the condition of substrate for rot or decay and make necessary repairs, including the sheathing or lath, and structural elements
- Use substrate appropriate for roof material and provide adequate ventilation under roof surface
- Use appropriate underlayment including building paper, rosin paper and/or ice shield
- Use a single type of metal compatible with roofing at fasteners, flashing, gutters and downspouts to avoid galvanic action
- Select a flashing material with a longer or comparable life span to the roofing material
- Reference industry standards such as SMACNA, Copper and Common Sense, and Slate for roofing information

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