



CITY OF PATERSON

Downtown Commercial Historic District

DESIGN GUIDELINES

ROOFING



Mansard roofs are typical of the Second Empire style and include a steeply pitched roof, with a low-slope roof above. In this example, the steeply pitched section is covered with slate shingles. The dormer windows provide natural light and ventilation to the top floor level and the stone surrounds are highly ornamented.

Also note the copper flashing at all of the roof edges and the decorative stone balustrade along the base of the roof.

PURPOSE OF GUIDELINES

- Encourage maintenance and retention of visible historic roof materials and elements
- Provide assistance in identifying problems with roofing and roofing elements and recommend potential actions for repair
- Encourage the location of non-historic roof elements in a manner that is not visible from the sidewalk

These *Guidelines* were developed in conjunction with the City of Paterson's Historic Preservation Commission (HPC) and with input of many diverse stakeholders. Please review this information during the early stages of planning your project. Familiarity with this material can assist you in moving a project quickly through the approval process, saving you both time and money. The HPC staff is available for informal meetings and to provide you with valuable information as you consider making improvements to your property.

Additional *Guidelines* addressing other historic building topics are available at 125 Ellison Street, Suite 408 and on the City's website at www.patersonnj.gov. For more information, to clarify whether your project requires HPC review, or to obtain permit applications, please call the HPC Staff at (973) 321-1355.

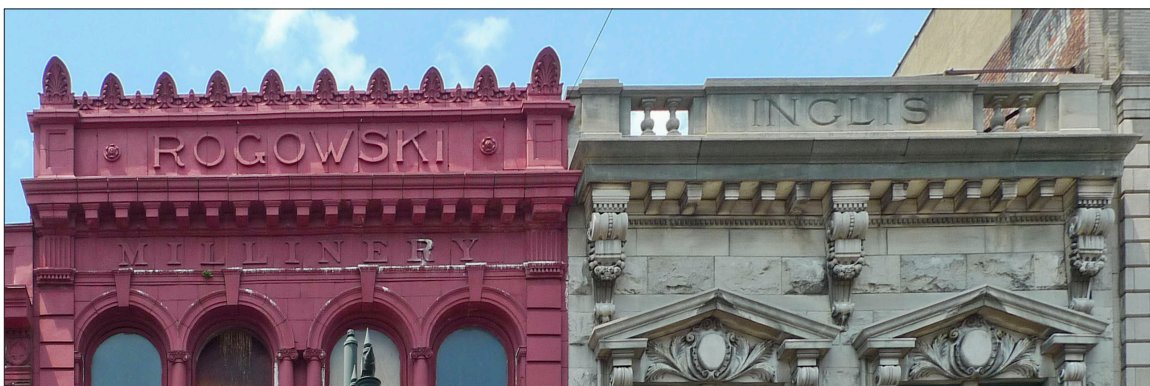
ROOFS

A building's roof provides the first line of defense against the elements while its design greatly affects its overall appearance. Therefore, the following should be considered for projects including a new roof or a roof alteration:

- Weather-tight roofing preserves a building and provides shelter from storm water, wind and sun
- Roofing helps define the building's character, silhouette and architectural style
- The form, color and texture of the roof and its associated features affect the scale and massing of the building
- Roofing variations add visual interest to the streetscape



There are a variety of low-slope roofing systems used in Paterson. Lighter color roofs tend to reflect sunlight and can reduce heat gain during warmer summer months.



In Paterson, most of the roofs are low-sloped, however they can include elaborate cornices and parapets. Both of these examples include the business names, and the shop on the left was a Millinery.

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. Most of the buildings in Paterson's Downtown Commercial Historic District (HCHD) were constructed following the Great Fire of 1902 with flat or low-sloped roofs, although there are a few exceptions. The building's exterior walls typically extend above the roof surface as parapets at the front and rear walls as well as between adjacent building. (Refer to photograph below, right.)

With the popularization of flat roof systems, greater emphasis was placed on the tops of street-facing facades in the forms of decorative cornices and parapets. Cornices project from the face of a building and were often made from decorative metals and terra cotta, and could have highly ornamented brackets, scrolls and projections. Parapets were often decorative and of varying styles and shapes such as an arched or stepped section, and could include the business name, the year of construction, or a balustrade. (Refer to *Guidelines for Architectural Metals* and *Guidelines for Masonry, Stucco & Concrete* for more information about cornice and parapet materials.)

HISTORIC ROOFING MATERIALS

Historically, roofing materials were selected based upon practical and aesthetic criteria, including pitch, weather conditions and availability of materials and craftsmen. With industrialization at the end of the 19th century and beginning of the 20th century, new roofing materials were introduced, including metal roofing, asbestos and asphalt based shingles, as well as varieties of rolled or built-up roofing for flat or low-sloped installations. As time progressed, the variety of metal roofing was also expanded to include copper, galvanized sheet steel and aluminum.

ROOF PITCH & MATERIALS

The pitch or slope of a roof helps define the appropriate materials for the roof. Although very few roofs are truly "flat", low-sloped, generally defined as a pitch below 3:12 slope, (3" rise for 12" run), require a watertight roofing system.

Low-pitched to flat roofs depend on a continuous or nearly continuous roof surface to minimize moisture infiltration. Material options for low-pitched roofs include soldered flat-seam metal roofing; built-up roofing, single-ply roofing, and modified bitumen roofing. Possibilities for moderately to steeply sloped roofs include unit materials such as slate, terra cotta, wood, metal and asphalt shingles.

To choose the most appropriate roofing materials for a building in the DCHD, it is important to first investigate existing conditions, such as how the roof is attached, how is drainage handled, and what weight limitations might exist.

DEFINITIONS

Cornices: Projecting horizontal moldings towards the top of the building wall.

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



Parapets often have a wood cant strip (sloped edge) at the rear to allow installation of roofing. Also note the metal bracket is peeling away from the wall.

Both cornices and parapets should be covered with a coping, or cover, to protect water from coming into wall structure. For cornices, the coping is often metal flashing. For parapets, it can be metal, stone or terra cotta.

METAL ROOFING

The use of metal for roofing became more common after the mid 19th century after sheet metal production techniques were expanded. Metal roofing was historically used on commercial, industrial and residential buildings. Traditional sheet roofing metals include lead, copper, zinc, tin plate, tern plate and galvanized iron. Many metal roofs require regular painting with traditional colors including silver, grey or green to minimize the potential for corrosion.

On decorative shallow pitch roofs, including cupolas or domes, small rectangular pieces of flat seam metal roofing were installed with edges crimped together and soldered to form a weather-tight surface.

Deterioration of the metal tends to occur from wearing of the protective painted or galvanized surface, chemical action, rusting, pitting or streaking, caused by 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 and non-adjacent metals, such as roof cresting via rainwater.

If the metal roofing 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 necessary. If considering replacement, applicants are encouraged to make every attempt to match seam patterns and color with the replacement material.

EVALUATING LOW-SLOPED ROOFING

Since many of the roofs in Paterson's Downtown Commercial Historic District have low slopes that are not visible from the streets and sidewalks, the following information is provided for reference. The HPC only reviews roofing materials and elements that are visible from the public way. When evaluating options for low-sloped roofing, it is important to consider the following:

- Whether the installation of the new roofing requires removal of all or portions of the existing roofing, or other preparation such as the installation of cant strips (sloped edges) where the roof surface meets the parapets
- Whether the existing roof structure can support the weight of the new roofing
- Whether it would be beneficial to add insulation to the roof system to improve thermal performance or to re-taper the slope to allow for proper drainage
- The maintenance requirements for the roofing including regular coatings, etc.
- The warranty for both the materials as well as the installation - these can often be different



The alligatorated roof surface indicates deterioration and is in need for replacement.

LOW-SLOPED ROOF OPTIONS

In addition to flat-seamed soldered metal, there are five basic types of low-sloped roofing materials that are readily available:

- **Single-Ply Membrane Roofs:** Commonly known as rubber roofing or EPDM, is often made of recycled materials such as tires and requires propane torch heat to install the seams - *Can be easily cut or torn, and since it is a single-ply system, a damaged membrane can lead to a water leak*
- **Built-up Roofing:** Also known as BUR, is overlapping rolls of treated felt using hot tar or asphalt that is also fire retardant - *Can become brittle and crack up over the years and is heavier than other roof systems and might require structural enhancement of roof*
- **Sprayed Polyurethane Foam:** Spray foam can be applied to a roof surface and acts as an insulating layer and can act as a roofing surface or be covered by another material or coating - *Care should be taken during installation since health issues can result from contact*
- **Asphalt Roll Roofing:** A single layer of asphalt-treated, granule coated felt is cold cement sealed or hot sealed to the primed decking or to a base sheet - *Because it is light-weight and highly likely to tear in expansion and contraction, it is typically considered a temporary roofing material*
- **SBS, APP or Modified Bitumen Rolls:** The roofing is made from asphalt, modifiers and solvents and can be connected with heat or adhesive - *Can be installed without seams, or have seams as strong as the body and are also attached directly to the top of a building, eliminating need for gravel weight above*

ROOFING & ROOFING RELATED ELEMENTS CHECKLIST

As a general rule, roofing and the associated components should be inspected every spring and fall, corresponding with the regular cleaning of leaves and debris from gutters and downspouts. In addition, it is best to inspect the gutters, downspouts and attic areas during a rainstorm to determine whether they are functioning properly. Flat roofs are best inspected immediately after a rainfall to determine whether standing water or ponding is present. Care should be taken when inspecting or maintaining roofs since they are potentially dangerous, especially when wet. If there are questions about if roofing elements should be replaced due to deterioration, consultation with a professional is recommended. It is usually less costly to fix a small problem than to delay action resulting in more extensive deterioration and repair needs.

MATERIAL / LIFE SPAN	INSPECTION REVIEW	RECOMMENDED ACTION
Roofing - General	<ul style="list-style-type: none"> Sagging or bowing of roof ridge, surface or rafters 	<input type="checkbox"/> Can indicate significant structural problems - consultation with an architect or structural engineer is recommended, particularly if condition worsens
	<ul style="list-style-type: none"> Loose or missing fastener at metal, tile and shingle roofing 	<input type="checkbox"/> Replace with compatible and appropriate fastener
Flat Roofs 10+ years	<ul style="list-style-type: none"> Bubbles, separation or cracking of the asphalt or roofing felt Feels loose, spongy or bouncy underfoot Water ponding on roof Mineral granules or gravel worn away Roofing felt looks dry or cracked 	<input type="checkbox"/> Consider patching of seams with compatible materials if area is isolated <input type="checkbox"/> Consider roof replacement if deterioration is substantial or leaking is observed - verify condition of roof substrate
Metal Roofs 60+ years	<ul style="list-style-type: none"> Substantial number of rust or corrosion spots Signs of previous tar patches 	<input type="checkbox"/> Tin, terne-coated steel and terne-coated stainless all need regular repair and painting every 5-10 years and can last for decades if properly maintained <input type="checkbox"/> Consider patching with compatible materials if area of deterioration is isolated - verify condition of substrate <input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent - verify condition of substrate
	<ul style="list-style-type: none"> Punctures in the metal Broken joints or seams 	<input type="checkbox"/> Consider patching or re-soldering with compatible materials if area is isolated <input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent - verify condition of roof substrate
	<ul style="list-style-type: none"> Bounce in surface of flat metal roof Ponding or standing water on surface 	<input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent
Flashing (Formed sheet metal at joint intersections to prevent moisture penetration)	<ul style="list-style-type: none"> Loose, corroded, broken or missing flashing Roofing cement or tar on flashing Un-caulked gaps at the tops of flashing Vertical joint does not have both base and counter flashing 	<input type="checkbox"/> Consider patching or replacement with compatible materials if area of deterioration is isolated, such as around a chimney <input type="checkbox"/> Consider roof replacement if deterioration is substantial
Roof Projections (Dormer, TV dish, antenna, vent, pipe, skylight, solar or mechanical equipment, cupola lightning rod, etc.)	<ul style="list-style-type: none"> Connections around roof projections are not properly flashed and watertight 	<input type="checkbox"/> Consider patching with compatible materials if area of deterioration is isolated <input type="checkbox"/> Consider flashing replacement if deterioration is substantial

MATERIAL / LIFE SPAN	INSPECTION REVIEW	RECOMMENDED ACTION
Chimneys	<ul style="list-style-type: none"> • Flashing around chimney is not watertight • Mortar joints in chimney are open or badly weathered • Masonry or stucco coating is cracked or crumbling • Chimney is leaning 	<ul style="list-style-type: none"> □ Consider patching with compatible materials if area of deterioration is isolated □ Re-point deteriorated or open mortar joints □ Consider replacement if deterioration is substantial - replacement might necessitate chimney rebuilding from the roof surface up - replicate all chimney detailing in reconstruction
	<ul style="list-style-type: none"> • Chimney is not properly capped • Chimney is not properly lined 	<ul style="list-style-type: none"> □ Install an appropriate chimney cap for the building style □ Install a chimney liner if wood-burning fireplaces are used or if masonry inside of flue is crumbling
Parapets	<ul style="list-style-type: none"> • Parapet is leaning • Components or parapet are loose 	<ul style="list-style-type: none"> □ Can indicate significant structural problems - provide sidewalk protection and notify Paterson's Division of Planning and Zoning who can recommend consultation with an architect or structural engineer
	<ul style="list-style-type: none"> • Flashing around parapet is not watertight • Mortar joints in parapet are open or badly weathered • Masonry is cracked or crumbling • Metal elements are rusting 	<ul style="list-style-type: none"> □ Consider patching with compatible materials if area of deterioration is isolated □ Re-point deteriorated or open mortar joints □ Consider replacement if deterioration is substantial - replacement might necessitate parapet rebuilding - replicate all parapet detailing in reconstruction
Gutters & Downspouts	<ul style="list-style-type: none"> • Clogged gutters or downspouts 	<ul style="list-style-type: none"> □ Review roof drainage during a rainstorm - water should collect in gutters and flow through downspouts without "spilling over" roof edge or ponding or pooling on the roof surface □ Inspect internal downspouts with a camera to see if the interior of the pipe is rusting and restricting water flow □ Clean out debris at least twice each year, in the spring and fall, or more frequently based on debris accumulation □ Install screens and/or strainers over downspout locations
	<ul style="list-style-type: none"> • Rusty, loose, askew or tilting gutters or downspouts • Open or missing seams in hanging gutters • Missing sections of gutter or downspouts 	<ul style="list-style-type: none"> □ Consider repair or patching with compatible materials if area of deterioration is isolated □ Consider gutter or downspout replacement if deterioration is substantial or sections are missing
	<ul style="list-style-type: none"> • Water ponding adjacent to foundation 	<ul style="list-style-type: none"> □ Re-grade area at foundation to direct water away from building □ Verify water exiting from downspouts is directed away from building foundation - install splash blocks or downspout extensions at base of downspouts

FLASHING, GUTTERS & DOWNSPOUTS

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 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. The life span of each material is based upon its thickness, how fast it deteriorates 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. The HPC strongly discourages the application of tar to coat flashing.

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 and are typical in the DCHD. Built-in gutters are formed of flashing materials typically wrapped around or within wood forms. Hanging gutters are located just under the roof slope edge and are usually metal with a half-round or profiled cross sections. Gutter materials have different life spans. New gutters should match historic gutter type and material. The installation of a hanging gutter in place of a built-in gutter is strongly discouraged.

Downspouts, also known as rainwater conductors, can be inside a building or mounted to exterior walls and conduct a gutter's water down from the roof to the ground or an underground storm water drainage system. Interior downspouts were often made from cast iron and the interior surface of the pipe can rust over time and reduce the water flow. Similar to gutters, exterior mounted downspouts can be fabricated of a variety of materials, in a round or rectangular profile, while interior downspouts tend to be cast iron. It is generally recommended that new exterior downspouts be made from galvanized metal. The HPC strongly discourages PVC downspouts, even if they are painted.



Rooftop features, such as this chimney, need regular maintenance, particularly to prevent storm water from entering a building.

ROOF FEATURES

Roof features are decorative and sometimes functional elements that help define the profile of a roof against the skyline and should complement the building's style. Historic rooftop features include finials, roof vents, water towers, chimneys, bell towers, turrets and monitors. More recent additions include skylights, mechanical and television equipment and solar panels.

Water towers were a common rooftop feature on commercial buildings in Paterson. They provided water for occupants and were used for fire fighting.



Water towers were historically placed on rooftops to both provide water to building occupants and to aid in fire fighting efforts. Although with improvements to public water systems and are no longer required, they are distinctive elements and a tribute to Paterson's past, and therefore should be maintained. Removal of existing water towers in the DCHD, even if not in use, is strongly discouraged.



Some skylights were historically located in warehouse and commercial buildings, providing natural interior light and ventilation. The visibility of new skylights should be minimized.

Skylights are sometimes historically found in commercial buildings. The installation of new skylights should minimize alteration of the roof structure, and should not be visible from the public way.

Rooftop mechanical equipment should not be visible from the street.



Restaurant ventilation systems typically provide exhaust for cooking equipment. The installation of restaurant ventilation systems is subject to building code requirements as well as HPC review. **Restaurant vents and exhausts should be installed in a location where they are not visible from the public right of way and within the building boundaries.**

Cellular collocation equipment, which includes **flat panel antennae, catwalks, railings, equipment sheds, and wiring raceways** are discouraged from the DCHD. If they must be located in the DCHC, the HPC encourages that their visibility from the public way be limited.

Roof mounted equipment including **mechanical equipment, vents, television dishes and antennae** 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.

The installation of all rooftop equipment where visible from the is public way strongly discouraged.

MAINTAINING ROOFTOP FEATURES

Many historic rooftop features are made from masonry including elevator penthouses, parapets, balustrades and cornices. In addition, rooftop features include metal elements such as cornices and water towers. Refer to the *Guidelines for Masonry, Stucco & Concrete* and *Guidelines for Architectural Metals* for additional maintenance information.

ADDING ROOFTOP FEATURES

Prior to installing new rooftop features, all required approvals must be obtained from the Division of Planning and Zoning. In addition, the following should be reviewed:

- Whether the rooftop equipment be visible by pedestrians and will require HPC review
- Whether the existing roof structure can support the new rooftop feature

ROOF SUSTAINABILITY OPTIONS

Property owners are more frequently looking towards their roofs when considering sustainable improvements to their buildings. Roof sustainability options can generally fall into the following categories:

- **Reducing Solar Heat Gain:** Because a roof surface is typically exposed to the sun for large portions of the day, the roof surface temperature, and often the attic below, can easily exceed 120° Fahrenheit. Although the added warmth may be appreciated in the winter, it can result in higher cooling needs in the summer. Possible ways to reduce solar heat gain include installing an attic fan or vent, or installing attic insulation to limit effect of heat gain in habitable portions of building. Another option is to install lighter colored, more reflective roofing if the roof surface is not visible from the public way, or to coat existing roofing.
- **Capturing Solar Energy:** Solar collector panels provide a renewable energy source for space heating, hot water and electricity. However, solar collectors should be located where they are hidden from public view. Verify seasonal shading of neighboring buildings should be considered to ensure sufficient year-round solar exposure to justify the expense of installation.
- **Improving Natural Lighting:** New skylights should be hidden from the public view, and should not disturb historic roof materials such as parapet walls.
- **Managing Storm Water Run-Off:** The rain that falls on a roof surface is typically diverted to a gutter, then a downspout, and discharged at the perimeter of a building or into a storm sewer. By reducing the amount of water that reaches the downspout, the sewer system is less likely to become overwhelmed in a significant storm. One way to reduce the water diverted to a gutter system is to install a green roof in a manner that the planted material is not visible by pedestrians.



Green roofs are becoming increasingly common in new construction, providing both an insulating layer of soil and reduced storm water runoff. They may be an energy-upgrade option for buildings with flat roofs and sufficient structural capacity.

ROOFING GUIDE

THE HPC ENCOURAGES:

- Replacing visible roofing material in-kind, and if in-kind is not possible, replacement material should appear the same as historic by pedestrians
- Considering quality, longevity and warranties for proposed replacement roofing materials
- Verifying whether existing roof structure can support additional roof layers, or if removal is required
- Maintaining, cleaning or repairing of roofing, roof accessories and historic rooftop features
- Securely installing fasteners and flashings with a similar expected life span to the roofing material
- Regular repainting of metal components susceptible to rusting and wood elements susceptible to rot and deterioration
- Cleaning of gutters and downspouts regularly, typically every spring and fall
- Inspecting of attics or top floors periodically after a storm or freeze to catch small leaks early to minimize the potential for interior damage

THE HPC DISCOURAGES:

- ✗ Removing or altering historic gutters and downspouts
- ✗ Installing visible PVC downspouts
- ✗ Removing roof features such as parapets, chimneys, dormers, cupolas, finials, etc.
- ✗ Adding or altering rooftop features or equipment at areas visible from a public way including skylights, antennas or dishes, solar collectors, water towers, mechanical equipment, roof decks, chimney stacks and dormer windows
- ✗ Using tar for major roof repairs or as a substitute for flashing
- ✗ Adding rooftop features that create a false historical sense without supporting documentary evidence such as cupolas or mansard roofs
- ✗ Adding new features that are out of character, scale, materials or detailing to the historic building
- ✗ Encapsulating decorative elements such as cornices, parapets and brackets with vinyl or aluminum capping or siding

ADDITIONAL AREAS OF CONSIDERATION:

- 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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PREPARATION

All components of the *City of Paterson Downtown Commercial Historic District Design Guidelines* including all text, graphic design, photography and illustrations unless noted otherwise were prepared by:

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