

# Roofs

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## Introduction

Although there are numerous shapes, sizes, slopes and styles of roofs, they all play the same vital role as an umbrella for your home. A watertight roof is the most important element for maintaining a building.

A roof is a large component of your building's architectural character, so it is important that a roof's materials and style be respected. Roofs are susceptible to damage caused by severe weather, ongoing exposure to the elements, poor material considerations or installation, and occasional foot traffic. This guide contains information on the various roof styles found in the Region, the components of a roof, and guidelines for roof inspection and maintenance. It is recommended that a professional roofer and/or an architect be consulted before doing any repairs or alterations to a roof. Take the proper safety precautions prior to climbing on a roof and take care not to damage the roofing materials.

## Roof Style

A roof's decorative features and pitch varies based on the structure's architectural style. Architectural styles are often a reflection of the local climate, regional traditions, available roofing materials, and desired living space.

Prior to undertaking a roofing project, understand your building's original roof style and investigate if previous occupants have altered the structure for extra attic room or stylistic changes. If you want to restore your roof to its original design, the original roof may still be intact beneath the current.

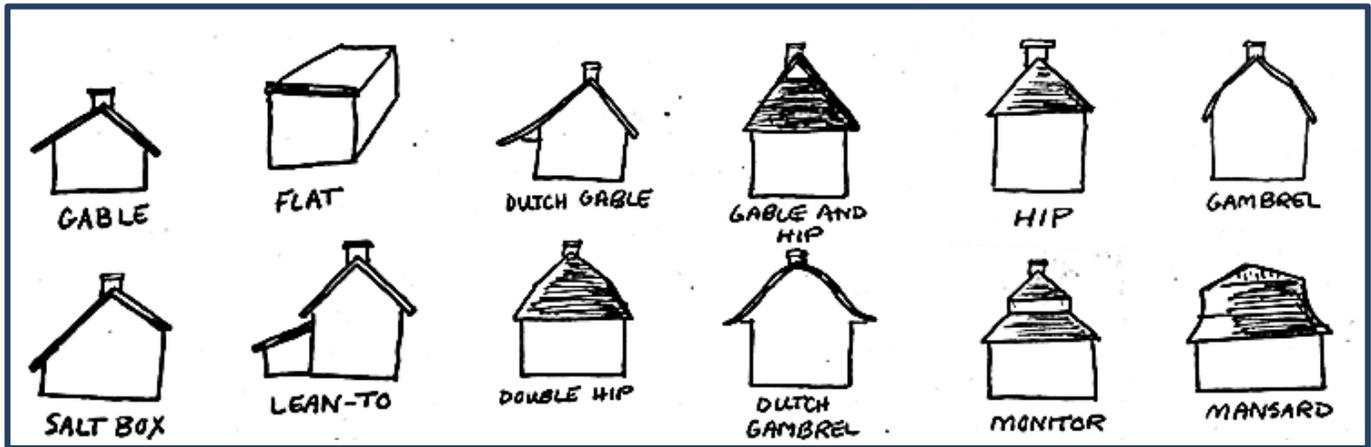


Image: Roof styles representative of a variety of architectural styles (Amanda Sherrington, 2013).

As noted above, roofing is incorporated into the general scheme of a home's style. The following drawings and summaries describe styles present in the Region of Waterloo. They have been published in Saint John's Practical Conservation Guideline.

### Greek Revival 1830-1860

Low pitched gable roof creates a temple-like profile. The cornice under the eaves can be wide, plain or dentilled.



### Gothic Revival 1850-1870

Steep pitched gable roofs usually include dormers, finials, pinnacles, and chimneys. Decorative roof-edge "bargeboards" are common.



### Italianate 1850-1870

Gently sloped hip or gable roofs that are often crowned by a central cupola. This style of roof exhibits deep projecting eaves, supported by large wooden brackets on a wide cornice.



### Mansard 1860-1880

Steeply sloped surface may be straight, curved, convex, or concave. Projecting eaves, supported by large wooden brackets on a wide cornice. Dormers and iron cresting is common.



### Romanesque 1875-1895

Steeply sloping gable roofs that are often intersecting. This style of roof can be enriched with delicate finials and terracotta panels.



### Queen Anne 1880 - 1900

Steep gables and intersecting roofs with dormers, turrets and towers, decorative iron cresting, finials, and patterned and coloured shingles that enrich the roofscape.



### Roof Architectural Details

#### Eaves

An eave is the edge of the roof that typically projects out beyond the building's exterior walls. Eaves are essential in directing water and snow away from the building's façade and foundation, preventing water from entering the building where the roof meets the wall, and can be designed to adjust a building's solar heat gain. Made of wood, eaves are typically enclosed by a soffit and fascia, and the eaves also enable the attachment or installation of gutters. Eaves are sometimes decorated with brackets, providing aesthetic cohesion by creating a distinction between the building's verticality and roof incline.

#### Gutters and Downspouts

Gutters and downspouts are important features of your home that help capture and move water out and away from the building. They can be attached on the exterior or interior (concealed from sight) of an eave or sloping roof. Exterior gutters and downspouts were originally made of copper or galvanized steel, while interior ones are likely terneplate, lead or copper.

It is important to keep gutters and downspouts clear of debris in order to prevent clogging. An electric heating cable can be installed in these units to prevent the freezing of water in the winter months. Downspouts should empty out onto the ground away from the building's foundation or can be connected underground to run into the public sewer or into a dry well.

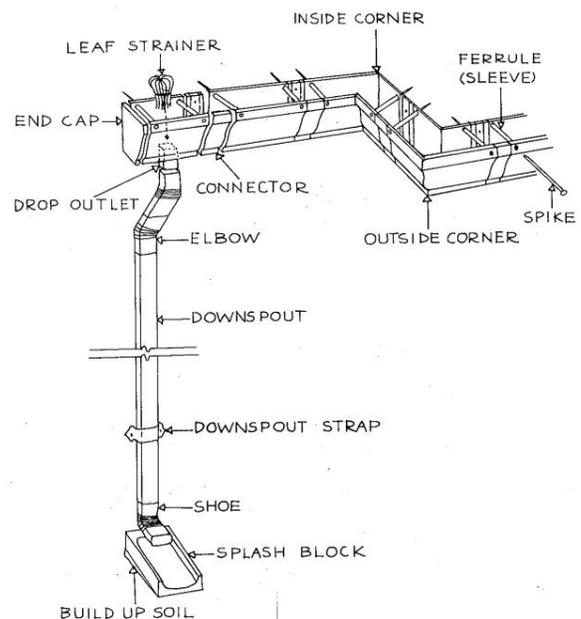


Image: Parts of a gutter and downspout (Betty Anderson, 1983, p.59)

#### Cornices and Parapets

A cornice is the horizontal decorative molding that “crowns” a building and was originally designed to throw rainwater away from a building's walls. In today's residential building practice, this function is handled by projecting gable ends, roof eaves, and gutters. However, house eaves may also be called "cornices" if they are finished with decorative molding.

On a flat roofed building, a cornice serves both an aesthetic and practical function, providing architectural interest while creating a weather tight seam between the façade and roof. The cornice may strictly adorn the main façade, or extend to all sides of the building.

A parapet is similar to a cornice and provides the same weather-tight function, but is most often much simpler and gives the building greater height. A parapet is capped by a single coping made of tile, metal, stone or pre-cast concrete.

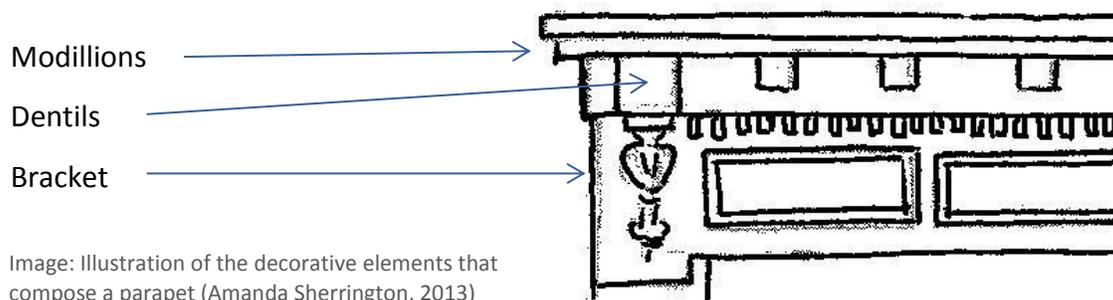


Image: Illustration of the decorative elements that compose a parapet (Amanda Sherrington, 2013)

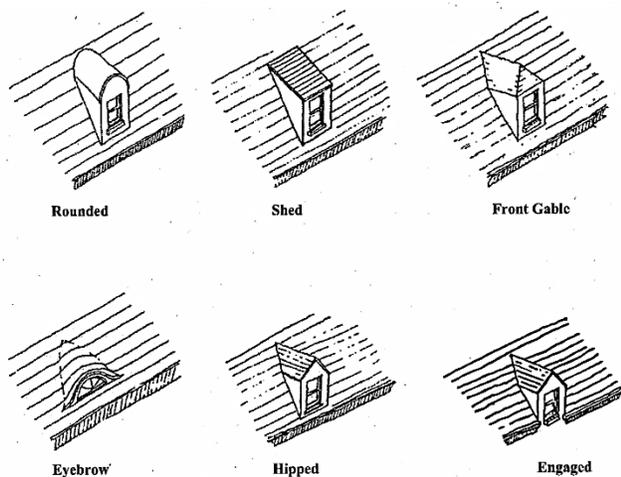


Image: Types of dormer windows (District of Columbia: Historic Preservation Guidelines, 2010, p. 7)

### Dormers

A dormer consists of windows or vents projecting from a sloping roof. The projections are capped with a roof of their own, most often a gable, hipped, shed or round roof. If adding new dormers, ensure that the style and size of the window or vent, as well as the slope of the roof, is consistent with the architectural style of the building. Consider reviewing the design guidelines available in the Region of Waterloo's Practical Guides for Additions and Windows, Shutters & Doors.

### Chimneys

An important character defining element, chimneys vary in quantity, design, materials and dimensions. They are most often constructed of brick, yet stone and stucco may also be used. Refer to the Region of Waterloo's Practical Guide: [Masonry](#) for masonry maintenance and repair information.

### Flashings

Flashings are used to seal joints. These may include roof valleys or places where the roofing material meets obstructions such as chimneys, windows and vent pipes. Flashings are considered the weakest areas of the roof since they are extremely susceptible to deterioration caused by water penetration. The material used for flashing should be compatible with that of the roof.

## Materials

### Wooden Shingles and Shakes

Shakes are made of split wood giving the building a very rustic look due to the inconsistency of sizing and thickness, whereas shingles are typically machine cut and tapered to give a smoother appearance. Locally, historic buildings with wooden roofs would have had shingles, not shakes. The durability and resistance of wooden shingles and shakes to rot and insects heavily depends on the quality of the material. White pine, cypress, oak, redwood and red cedar were often used for roofing. New shingles and shakes currently on the market are typically made out of cedar and will on average last between 30 to 60 years. Since wooden shingles and shakes present a fire hazard, they were often replaced in urban areas with fire-resistant options.

### Asphalt and Fiberglass Shingles

Asphalt shingles are constructed of felt that is saturated with asphalt, and topped with a final coating of ceramic grains. Today, higher quality and more fire-resistant shingles made of fiberglass offer a longer lasting option. Asphalt shingles are often preferred for their relatively low price. Asphalt shingles will typically last for 15 to 25 years before requiring replacement. Asphalt shingles are made that imitate the texture and shadow of traditional roofing materials such as wooden shingles.

### Slate Shingles

Slate roofs are constructed on thin natural slate shingles nailed to wooden cross members. These shingles will typically last for 60 to 125 years before requiring replacement. They require low maintenance and are fire-resistant. Slate was popular on 19th-century Mansard and Gothic, and 20th-century Tudor Revival buildings due to the materials availability in different colours and the ease of creating intricate patterns. Slate's quality and longevity will vary depending on the source of the material and regular maintenance. The nails supporting the shingles will often deteriorate first, requiring frequent inspections to identify corroded or loosened nails and roof fasteners. For this reason, ferrous metals should not be used as fasteners or nails. Copper or zinc-coated metals are recommended.

Slate is prone to cracking under too much direct weight, and will become brittle with age. To avoid cracking slate shingles, you should never directly step on them. Use wooden planks or ladders, and learn how to distribute your weight to limit damages. Other factors responsible for the cracking of slate, such as hail and fallen branches, are more difficult to prevent.

### Sheet Metal

The types of metal used in historic sheet metal roofing vary and include: copper, lead, terneplate, tin plate, galvanized iron and zinc. Existing metal roofs should be maintained and/or replaced in kind. Some roofing companies still specialize in sheet metal roofs.

Non-ferrous metals, such as copper, should never be coated or covered. Sheet metal roofing will most likely last for up to 60 years, and potentially longer if well maintained. Its lifespan will be shortened by deterioration or corrosion, as well as galvanic action and rust. One advantage to metal roofing is that it can be installed on lower sloped surfaces.

### Tile

Tile roofing, either terra cotta clay or concrete (cement) tiles, are installed on moderately pitched roofs. Tile roofing is much heavier than other roofing materials, and will require structural reinforcement. Tile roofing will most likely last for a minimum of 50 years, and will usually have a lifespan of 80 years if well maintained. Similarly to slate, roofing tiles cannot support too much weight. If terra cotta clay tiles were under-fired, their porous surfaces will encourage spalling and cracking caused by freeze and thaw cycles.

## Inspection

Roofs are extremely susceptible to damage caused by weather, water, sunlight, pollutants, animals, insects and occasionally foot traffic. Roofs should be inspected for physical damages and deterioration at minimum twice a year by carrying out a dry and wet inspection. It is important to exercise caution when inspecting your roof and attic. Never attempt to walk on a wet, damp or frost covered roof. Although you will need to directly access a flat roof for assessment, a sloped roof can be inspected from the ground with binoculars. A professional should be contacted if you are unable to perform an inspection.

### Wet Inspection

A wet inspection is conducted during a heavy rain fall, from the ground with binoculars. If you notice any branches knocking the building due to heavy winds, have those branches cut. Check the gutters and downspouts. If the gutters are overflowing with rain water, you will most likely need to clean debris from within or find a better fitting gutter. Ensure that the downspouts are directing water away from the building, and that the site has a good drainage scheme. You will also want to carefully inspect the interior of the attic, to see if there are any leaks. Any damp areas should be noted and measured, and inspected on the exterior of the roof once it has completely dried.

### Dry Inspection

A dry inspection should be conducted once the roof has dried but soon enough after rainfall to be able to see if there is any standing water and/or damaged or deteriorating roofing materials. Pay close attention to areas that are more susceptible to leaks, such as any location with a pitch change, and valleys and joints between the roofing and other materials (siding, flashing, chimney, etc.). Once again, check the attic interior for any damp areas and record findings.

For safety reasons, only access the roof if you are equipped with the proper safety equipment (secured ladder and high traction shoes) and are knowledgeable about your roof's material and design. Ensure that your ladder will not damage the gutter or edge of the roof, and install appropriate brackets if worried. Be cautious of wet leaves as they are slippery.

### Maintenance and Repair

After inspecting your roof, any observed cracked or clogged gutter should be remedied immediately to prevent water damage. If any deterioration is detected, a qualified roofer should be consulted. Temporary patching should be carefully chosen to limit further damage to the building envelope. Repairs should only be conducted on deteriorated or damaged units. Refrain from altering or replacing roofing that is still intact and functional. Regular inspections should not be neglected, as eventual repairs and their expense will often reflect the amount of time that a roof was left unattended. It is important to undertake repairs to the structure, if necessary, before conducting repairs on the roof's surface.

Damages could be made inadvertently by service employees fixing cables, or painters that are not familiar with the weaknesses of your roofing material. It is important that you familiarize yourself with your roofing material in order to inform service employees of the best plan of action so that damages do not occur.

Vegetation growing on or near the building should be maintained to ensure that it does not cause damage.

### Flashings

Small holes in flashings can be mended with roofing cement or solder. Caulking can always be applied to seal gaps between different materials and will permit flexible joint movement.

### Wood Shingles

If wood shingles were sawn across the grain, moisture will eventually penetrate and deteriorate the material. If your wood shingles or shakes have deteriorated, remove and replace only the affected area with like materials. If corrosion stains and streaks are apparent, copper nails might have been used in combination with cedar shingles. These materials are not chemically compatible.

### Asphalt Shingles

Roofing cement can be used to glue down asphalt shingles that have curled out of place and to cover nails once hammered into place. Deteriorating shingles will need to be replaced once mineral granules start to shed from the surface.

### Slate Shingles

If slate shingles have cracked or have detached due to corroded anchors, remove and replace them with like material. Minor cracks may be remedied with roofing cement.

### Sheet Metal

Deterioration of all metals is encouraged by pollutants and moisture. These pollutants can come from the air, acidic rainwater, more acidic wood (red and white cedar, chestnut, oak, Douglas fir), moss, and certain materials in Portland cement and lime mortar. Mixing of different metals will also enable electro-chemical corrosion.

Ensure that all metals used are compatible and that paint used to cover ferrous metals is well maintained to inhibit the metal from rusting. If the metal has corroded slightly, a soft bristle wire brush can be applied to clean the surface before re-priming and painting. Extensive corrosion, abrasion and pitting will require replacement. Only the corroded metal should be removed and replaced with like material and application techniques. A drop of solder will usually fix small holes, and will not require full scale replacement.

### Tile

If terra cotta clay or cement tiles have cracked or have detached due to corroded anchors, remove and replace them with like material.

## Replacement and Substitute Materials

All roof materials will eventually need to be replaced in whole or in part. If original, replace the roof of your heritage home in kind, with the same roofing material, colour and design (roofing pattern). If it is not possible to replace the existing material with like materials, assess your other options carefully. Consideration should be given to the material's longevity, colour, chemical composition, compression and expansion potential, price and compatibility. Rather than installing your new roof on top of the old, remove the old roof before installation to give the new roof's materials greater flexibility. While the roof is bare, inspect underlying materials for potential deterioration.

## Insulation

A roof's performance is not limited to its ability to shed water, it should also possess the capacity to prevent heat loss during winter months and heat gain during the summer months. A uniform snow build-up on the roof is desired. If irregularities in snow melting patterns, icicles or ice dams are noticeable, the roof most likely lacks adequate insulation or ventilation. It is important to remember that your heritage home needs to breathe and that unsympathetic insulation can actually deteriorate

your roofing materials. To find out about ventilation and insulation options for the attic, speak to a professional about correcting these problems and refer to the Region of Waterloo's Practical Guide: Insulation.

## Skylights and Solar Panels

The installation of these features should be done in a way as to not alter your home's character. Although your heritage home may have utilized skylights to illuminate interior spaces, contemporary skylights should also respect the home's character and architectural style. Design considerations for new skylights and solar panels recommend that they follow the home's colour palette and that they be installed at the rear of a building where they are not visible from the street. Before applying these features to your home, ensure that their impact on the structure will be reversible and will not damage the original fabric.

For more information on the installation of solar panels, refer to the City of Kitchener's [Guidelines & Checklist for the Installation of Solar Technology on Cultural Heritage Resources](#).

## Summary

As a property owner, it is vital that you are familiar with your roof's components and understand the importance of protecting your home from the elements. Unforeseen circumstances aside, you can regularly inspect and anticipate necessary repairs to limit expensive maintenance and replacement projects. However, do not put yourself in harm's way. Hire a professional roofer for inspections and repairs if necessary. Your home will benefit immensely from an efficient and stylistically sound roof.

## References

If you would like to learn more about conserving your roof, please refer to the following primary sources:

City of Saint John. (2010). "Saint John Heritage Conservation Areas: Roofs." The City of Saint John Practical Conservation Guideline.

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District of Columbia, Historic Preservation Office. (2010). "District of Columbia historic preservation guidelines: Roofs on historic buildings."

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National Trust for Historic Preservation. (2009). "Start with the roof: A guide for keeping weather-tight." [http://www.preservationnation.org/information-center/sustainable-communities/buildings/weatherization/roofing/additional-resources/nthp\\_roofing.pdf](http://www.preservationnation.org/information-center/sustainable-communities/buildings/weatherization/roofing/additional-resources/nthp_roofing.pdf)

Sweetser, S. M. (1978). "Roofing for historic buildings." National Preservation Services: Preservation Briefs #4. <http://www.nps.gov/tps/how-to-preserve/briefs/4-roofing.htm>

Additional sources:

Fram, M. (2003). "Well-preserved: The Ontario Heritage Foundation's manual of principles and practice for architectural conservation." Boston: Boston Mills Press.

Hanson, S. & Hubby, N. (1983). "Preserving and maintaining the older home." New York: McGraw-Hill.

"On the roof: How to inspect and maintain it," in Nuts and Bolts. Reprinted from the Canadian Heritage Magazine (February 1982): 38-40.

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