5 Preserving Building Materials

PRESERVING BUILDING MATERIALS

All buildings are constructed of a variety of materials, each of which requires individualized repair and replacement techniques. When major repairs are required, or even when minor repairs to significant features are needed, using the services of contractor with demonstrated preservation ability is encouraged. Good preservation practices for the most common building materials are summarized below. The *Preservation Briefs* mentioned throughout this section are pamphlets published by the National Park Service that contain technical information about preservation topics. They are listed in Part 8, "References."

Maintenance

Ongoing maintenance is like preventive medicine for buildings. The most important goal of preservation is to retain existing historic materials, and this is only possible if the materials are properly cared for. Although few people would go so far as to take a wreaking ball to a historic property (and this is prohibited in the Northville Historic District) "demolition by neglect" can be just as devastating. Lack of maintenance and improper maintenance lead to loss of historic materials as well as to decreased property values.

The first step in any maintenance program is to make regular (annual) inspections. Water is the biggest threat to building materials, and therefore the roof, windows, and exterior walls should be checked for holes, rot, rust, discoloration, or any indicator that water is penetrating the building shell. "A stitch in time saves nine" is an appropriate and cautious approach to maintaining a historic structure.

Maintenance Guidelines

- Don't put off maintenance until a problem develops. Inspect annually.
- Keep the building weathertight, including all exterior elements such as the roof, walls, mortar joints, windows, chimneys, parapets, and cornices.
- Protect the exterior from deterioration to avoid hazardous conditions that shorten the life of the building and undermine the historic character of the District.

Wood

Wood is by far the most common building material in the Northville Historic District. Wood is a relatively inexpensive, renewable, and versatile material that can be used for building structure, siding, roofing, and ornament.

The naturally occurring cells in wood make it porous, therefore it readily absorbs and releases water. When wood absorbs water it swells; when it dries it shrinks. Water absorption can lead to wood rot. Swelling and shrinking can split or warp wood. Wood is also susceptible to insect damage. A protective coating on wood (for example, paint) helps prevent water and insect damage.

Wood Guidelines

- Retain architectural features such as siding, cornices, brackets, window hoods, columns, and verge boards. These are an essential part of a building's character and appearance.

- Consider epoxy consolidation of material in order to keep it in place.

- Do not resurface wood buildings with new material that is stylistically inappropriate or that was unavailable when the building was constructed, such as artificial stone, brick veneer, asbestos shingles, vinyl siding or aluminum siding. Such materials can also contribute to the deterioration of the structure from moisture and insects.

- Maintain the same exposure (width of board showing) of wood clapboard siding when replacing deteriorated material.

- Maintain paint film to protect wood material from deterioration. Repaint surfaces as soon as they show signs of peeling or cracking.

- Do not sandblast or use other abrasive cleaning techniques which damage the surface of the material.

- Keep gutters and downspouts clean to protect wood siding, trim, and the roof structure from water.

- Keep the building well ventilated to prevent condensation and moisture damage.

Brick Masonry

Brick is a combination of cement, sand, and aggregate which is formed and oven fired to give it a hard exterior. Bricks come in many colors, textures, and sizes. It is a durable, low maintenance, and attractive building material. Mortar is a mix of cement, sand, water, and sometimes lime, which bonds the bricks together to form a wall. The "fired" surface of brick and solid mortar joints are what keeps water out of a masonry wall. It is therefore essential to prevent damage to the brick surface and to maintain the mortar joints.

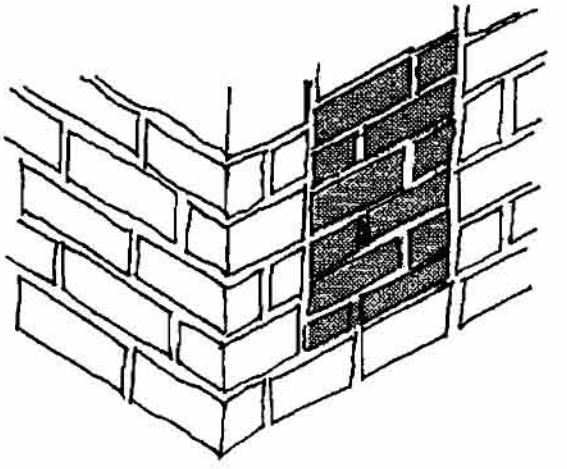
Brick Masonry Guidelines

- Retain original masonry and mortar whenever possible without the application of any surface treatment.

- Clean masonry only when necessary to halt deterioration or to remove graffiti and stains. Use only the gentlest cleaning method possible, such as low pressure water spray and soft, natural-bristle brushes.

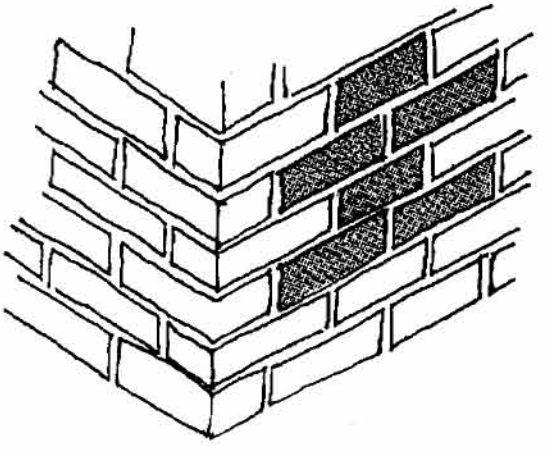
- Do not sandblast, since this method of cleaning erodes the surface of the material and accelerates deterioration. Do not use chemical cleaning products that would have an adverse chemical reaction with the masonry materials. (See Preservation Brief =1, *The Cleaning and Waterproof Coating of Masonry Buildings*, for more information.)

- Do not apply waterproofing or water repellent coatings or surface consolidation treatments unless required to solve a specific technical problem that has been studied and identified. Coatings are frequently unnecessary, expensive, and can accelerate deterioration of the masonry by trapping water vapor.



Improper Repair

New bricks have been cut into the existing brick. The size of the bricks doesn't match, and the coursing is out of alignment.



Proper Repair

Replacement bricks are toothed into the existing masonry. Brick size and mortar joints match the original.

- Repoint only those mortar joints where there is evidence of moisture problems or when sufficient mortar is missing to allow water to stand in the mortar joint. (See Preservation Brief #2, *Repointing Mortar Masonry Joints in Historic Buildings*, for more information.)

- Do not use electric saws or hammers to remove mortar, since this can seriously damage the adjacent brick.

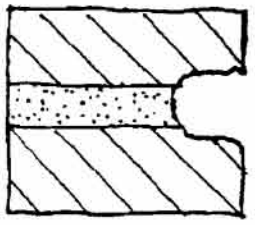
- Duplicate old mortar in composition, color, texture, joint size, method of application, and joint profile.

- Do not repoint with mortar of high portland cement content, thus creating a bond that can often be stronger than the masonry. This can cause deterioration as a result of the differing coefficient of expansion and the differing porosity of the material and the mortar.

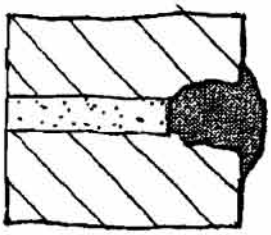
- Select replacement brick to match the existing in color, size and texture. Use existing historic bricks from hidden or secondary facades to make repairs on the front of the building.

- Match the existing joint pattern and coursing when filling in with new masonry. Tooth in new brick; do not cut into existing brick.

- Remove ivy from brick surfaces as it holds water against the surface and hastens deterioration.

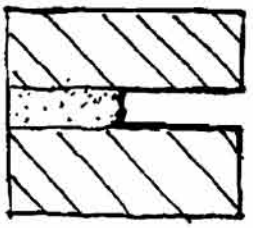


Edges of brick have been damaged by power tools. Not enough old mortar has been removed

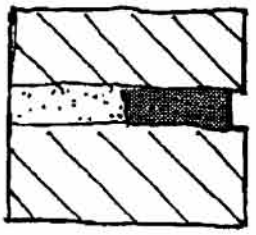


Mortar is applied over the damaged edges. Thin portions will fall off. The joint looks wider than the historic.

BAD REPOINTING



Hand tools leave brick edges intact. Mortar is removed to 3/4" depth.



The new joint is tooled to match the existing depth, width, and texture of the historic joint.

GOOD REPOINTING

Terra-cotta

Terra-cotta is fired clay product, similar to brick, but much harder and compact. Glazed architectural terra-cotta was developed in the 19th century. Terra-cotta units are molded in blocks, which can be very intricate. The density of the clay allows for very crisp edges and fine details. Terra-cotta is more often a commercial building product used in conjunction with masonry to form cornices, window surrounds, and relief panels. In some cases it covers the entire facade.

Water is the most frequent cause of deterioration and the glaze is most prone to damage. If water is penetrates the clay (generally from the back side, or between joints), it can cause the glaze to crack in an alligatored pattern called "crazing." Spalling—where pieces of the clay pop off of the surface is a more severe form of water damage and is the result of freeze/thaw action.

Terra-cotta is attached to a building with a combination of mortar and metal ties. Water can rust the ties, and lead to staining and structural failure. Settling or other structural movement can crack terra-cotta units. (Refer to Preservation Briefs #7, *The Preservation of Historic Glazed Architectural Terra-Cotta*, for more information.)

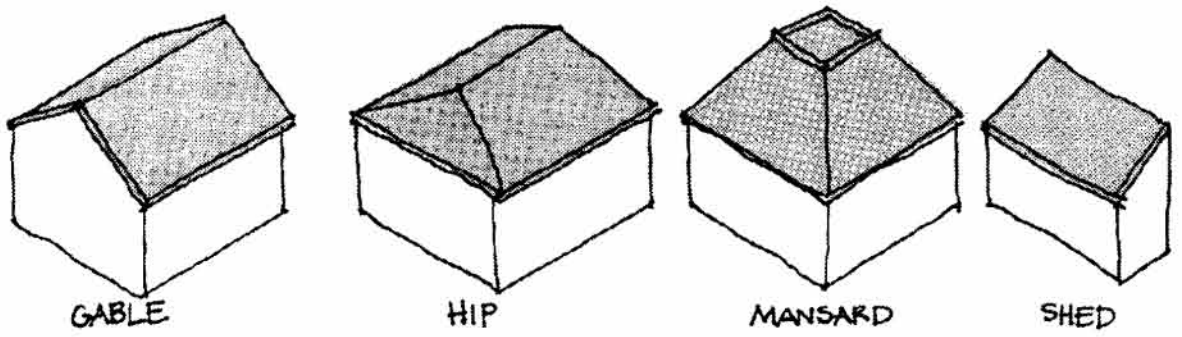
Terra-cotta Guidelines

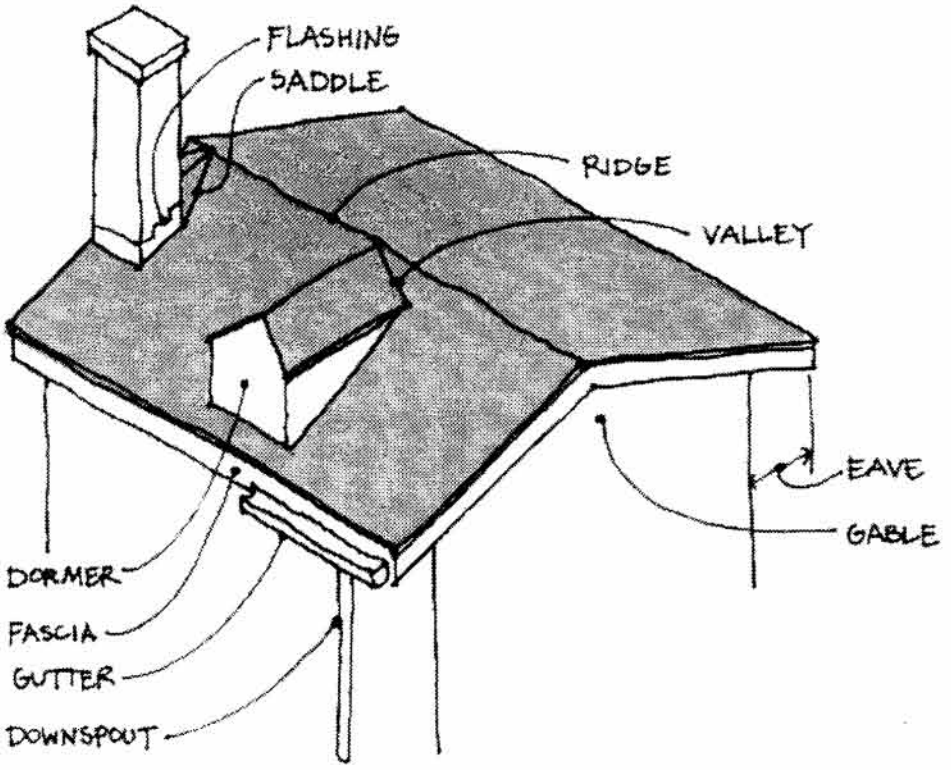
- Do not apply paint or other coatings to terra-cotta.
- Inspect mortar joints, and tuck point or repoint to keep water out of the joints.
- Inspect flashing and caulking, especially around terra-cotta cornices. Repair open joints.
- Replace terra-cotta with units that match the historic units.
- Look for signs that metal ties have deteriorated, such as units shifted out of place or rust stains.
- Clean with a water and detergent wash using nylon brushes. Acid cleaning, high pressure water cleaning, sandblasting, and wire brushes will abrade the surface, damage the glaze, and lead to further water damage.
- Terra-cotta repair and fabrication is a specialty not often performed by masons. Hire a specialized contractor.

Roofing

The roofing system is arguably the most important part of a historic building. It is the first level of defense when it comes to protecting the interior and the exterior materials from the elements. The shape, size and color of a roof are dominant visual features. Some of the common roof types and terms are illustrated below.

Roof Types and Features





Many materials are used to cover the roof structure—straw, tile, wood shakes, clay tile, asphalt shingles, metal, slate, rubber membrane, and others. Asphalt shingles, slate, and metal are the three typical materials seen in the Northville Historic District.

Slate Roofing

Slate is a very permanent and beautiful stone roofing material. It is available rough or smooth in reds, browns, greens, and grays. Slate is a dense, non-porous stone that becomes even more durable as it is exposed to the weather. It is cut into rectangular tiles of about 1/4" thick. Slates are secured to the roof with nails in pre-drilled holes. Slate was a common roofing material from the mid 1800's through the 1920's, until less expensive, mass-produced roofing products (asphalt shingles) came into use.

Deterioration of slate is caused by freeze/thaw action when water (from plugged gutters and downspouts for instance) is trapped under the slates. Water will also rust galvanized nails, and slates will shift or fall off and break. It is necessary to keep water from sitting on the slates, and therefore a somewhat steep slope and smooth, durable, copper flashings are important features of a slate roof. Slate is not a resilient material so damage can also result from the impact of falling branches or walking on the roof.

Slate Roofing Guidelines

- Do not apply coatings such as tar, paint, or substitute roofing material over slate roofs.
- Inspect and clean gutters, downspouts, and valleys at least once a year. Inspect the roof from the attic for signs of leaks.
- Replace broken slates with slates that match the existing color, thickness, texture, and size as closely as possible.
- Use copper slating nails to attach slates.
- Use copper flashing in valleys. Extend flashing at least 6" under the slates.
- Slate roofing is a specialty, and not frequently done by asphalt roofing contractors. Hire an experienced slater.
- Do not walk on a slate roof.
- Clean organic growth such as mold or fungus with a diluted ammonia solution.
- Do not nail through slate to attach antennas, gutters, etc.

Asphalt Shingles

Asphalt shingles are a relatively modern and extremely popular invention. The shingles are inexpensive, easy to install, waterproof, and in some of the better shingles small holes are self healing. They are made by saturating either organic felt or fiberglass with petroleum based asphalt. The asphalt is then imbedded with particles of stone which give the shingles their color.

Asphalt shingles are attached to the roof with nails. As on any roof, it is important to keep water flowing off of the roof. Water from clogged gutters and downspouts can back up under the shingles, saturate the wood decking, and cause water damage to structure and interior finishes. Each place that a shingle is punctured with a nail is a potential spot for water penetration.

Asphalt shingles react to the sun, and can become brittle with age. They need to be replaced approximately every 15-20 years, depending on the shingles.

Asphalt Shingle Guidelines

- Remove old shingles before installing new shingles. There should be no more than two layers of shingles on a roof.
- Don't nail on gutter straps, antennas, etc. through shingles. Hang gutters with straps located under the shingles.
- Inspect and clean gutters, downspouts and valleys at least once a year. Inspect the roof from the attic for signs of leaks.
- Make sure the roofer installs a metal drip along the edge. This will force water to roll off the roof instead of being pulled back up under the singles.
- Select color and pattern to match original roofing.

Metal Roofing

Galvanized sheet steel, tin plate, terne coated steel, copper, and lead coated copper roofing is often seen on porch roofs and balconies. Individual metal sheets are joined together by soldering, or with interlocking bent seams. If the seams are raised from the roof, they are called "standing seams." Traditional metal roofing systems rely on soldering to provide water tightness, however some contemporary versions snap together and are not require soldering. The biggest metal roofing problems are caused by corrosion and joint failure. Even flat roofs need to have a slight slope to prevent water from ponding on the roof. Seams must be tight, and joints must be continuously soldered to keep water out.

All steel based metal roofs are subject to rust to varying degrees. Some metals also experience less obvious, but very serious accelerated corrosion when in contact with "incompatible" materials. This "galvanic corrosion" is a result of mild electrical action between two incompatible materials in the presence of water.

Galvanized (zinc coated) sheet steel roofs offer good resistance to rust. Even if the coating is damaged, the remaining zinc coating reacts chemically to protect small exposed areas, thus slowing the corrosion process. Unpainted galvanized surfaces are subject to corrosion from standing water, acids, (including "acid rain"), contact with acidic wood species (such as redwood, cedar, oak, and sweet chestnut), or contact with concrete and plaster. Runoff from wood shingles can also accelerate corrosion of galvanized steel. When in contact with such materials, galvanized steel should be coated with bituminous paint.

Tin roofs are actually tin-plated steel sheet roofs. Tin and terne plating are very similar to one another in chemical composition and durability. Tin protects the underlying steel sheet as long as the coating is intact. Once the coating is worn away or damaged, corrosion sets in and accelerates rapidly. Painting is a necessity for tin roofs, preferably on both sides. Tin roofs are subject to galvanic corrosion when in contact with incompatible materials such as copper, bituminous and asphaltic roofing materials. Paints and patching compounds containing acids, asphalt, bitumen, or aluminum can also accelerate corrosion.

Copper is a very durable, corrosion resistant, and easily workable roofing material. The familiar green patina seen on old copper roofs is actually a layer of corrosion which forms a protective layer over the underlying metal, thus preventing further corrosion. Lead coated copper combines the workability and economy of copper with the durability and appearance of lead. The lead coating is highly corrosion resistant, and prevents the formation of green copper patina - useful where water running over the green copper may cause staining of surfaces. Lead coated copper weathers to a gray color.

Although copper derives little benefit from painting, it is sometimes painted to improve its resistance to abrasion. However, it is difficult to get paint to adhere to copper because of the grease and oil used in the manufacturing process. Special surface preparation is required to achieve good adhesion. Copper is generally corrosion resistant, but can be attacked by some acids. Copper in contact with "incompatible" materials such as iron or steel (including tin plated materials) will cause galvanic corrosion of the other material, and therefore should not be used with such materials with out protection. Because copper is soft, it is easily worn by abrasive materials.

Metal Roofing Guidelines

- Repair or replace roofing materials with like materials to maintain the material and visual character of the roof including spacing of joints, the height of seams, surface profile, and finish of the replacement material.

- Do not replace metal roofs with unlike materials such as rubber or other membranes when the roof is visible to the public.

- Galvanized metal should be painted as a primary means of protection. Areas subject to abrasion such as roof valleys may be difficult to keep adequately coated. Paint should be inspected periodically to ensure that the coating is sound. Careful and thorough surface preparation is necessary to achieve a sound paint coating.

- Avoid conditions where galvanized roofs are in contact with acidic woods, concrete, and plaster.

- Spot repairs to galvanized steel and tin plated roofs can be made with soldered patches, although replacement of corroded sheets is frequently required. Such repairs require skilled experienced sheet metal workers to achieve good quality craftsmanship. Not all roofers are familiar with such work, so qualifications of should be reviewed to ensure that they are familiar with work on metal roofs.

- Do not coat tin roofs with bituminous roof coatings. These coatings drastically accelerate the corrosion of the underlying tin plate, which will frequently completely crumble away, leaving only the weak coating to resist water.

- Use galvanized iron or steel nails and cleats on tin roofs. Copper should not be used because of the potential for galvanic corrosion.

- Bituminous roofing cements and coatings will cause corrosion to copper and lead coated sheets, and should not be used.

- Copper is subject to cracking due to flexing, including that resulting from expansion and contraction. Soldered patches should not be used unless joints are also mechanically interlocked; copper and solder expand differently, and non interlocked joints will soon fail.

- In general, deteriorated copper elements should be replaced as a whole rather than patched.

- Copper roofs expand and contract greatly with temperature variations, so they should be provided with adequate expansion joints.

Stone

On Northville's late nineteenth through early twentieth century commercial and certain residential structures, architectural stone is generally used as a ornamental accent material complementing overall brick masonry construction. On some mid-century buildings such as banks, it is used as an overall cladding material covering entire surfaces of facades. There are a few examples of American fieldstone construction used on residential porches and retaining walls. Stone is durable, strong, and projects a image of strength and permanence. Even simple ornamental carved stonework represents a rare craft which is seldom used in contemporary construction due to the high costs, and is worthy of preservation.

The stone used most frequently in Northville is limestone, which was easily worked, durable, and readily available in the Midwest. Some sandstone is also seen - a material also readily available in the Great Lakes area, although not as durable as limestone. Stone clad buildings of the mid-twentieth century are generally granite. Marble is also found as an accent material in a few examples. Granite and marble were shipped long distances to Michigan, and are generally considered more luxurious than limestone and sandstone, which cannot be finished as finely as marble an granite. Fieldstone was most often granite and limestone, found locally in fields being cleared for farming.

Although stone is perceived as a nearly indestructible "material for the ages," it is subject to deterioration due to mechanical damage and water. The most frequent causes of stone deterioration are poor detailing, deteriorated mortar joints which admit water between stones, and stone in contact with wet soil. Water absorbed into stone dissolves the cementing materials holding it together, and freezes, causing material to "spall." (Pieces of the surface detach and fall away from the stone.) Soft stone such as sandstone is most absorbent, and subject to the greatest damage from water. Limestone is the next most vulnerable stone. Granite and marble are more resistant to water absorption and its resultant damage, but are not immune to it.

Stone Guidelines

- Avoid stone repair methods such as patching and coating with cement containing materials. Avoid "waterproofing" coatings intended to keep water out of stone. Coatings actually can accelerate deterioration by sealing moisture inside of the stone. Stone should never be "waterproofed" with materials which do not breathe. Generally, even breathable, "water repellent" treatments which allow moisture to escape should be avoided. (Under unusual circumstances, such as on soft sandstone, such treatments may be appropriate.)

- Special care should be given to keeping stone mortar joints adequately pointed to keep water from entering the stone.

- Stone should be repaired rather than removed and replaced whenever possible. Patching with mortar and other cementitious coatings should not be permitted. Patching with specialized materials designed to "breathe" and permit moisture to escape may be acceptable, but technical information should be reviewed to determine their acceptability.

- Sandblasting is not to be used on any stone because it is too destructive to stone surfaces

- Clean stone carefully to avoid damaging stone finishes and destroying detail such as tooling or carving. Power washing should be limited to pressures of 700 psi or less for granite and marble, and 300 psi or less for sandstone. Tests should be performed on an individual basis to determine the minimum pressure required to adequately clean without removing stone material.

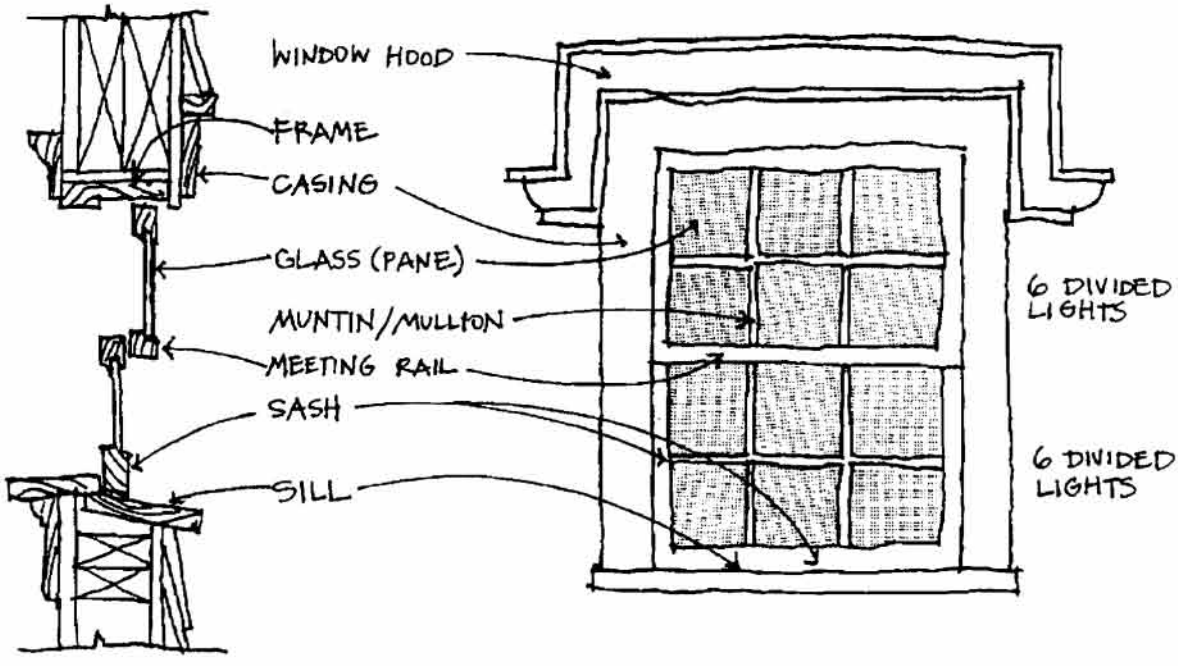
- Use of pressurized water alone to clean stone is not recommended. Use of detergents and chemical cleaners will reduce the amount of pressure required to clean the stone.

- Protect absorbent stone from contact with moist soil or water. Grading of soil to slope away from stone is recommended. Isolating stone with flashing, or impervious damp courses will also help preserve stonework.

Windows

Windows play a major role in both the function and architectural character of a historic building. They are also one of the most frequently removed or altered components. Windows are often replaced or modified because of maintenance concerns, thermal performance, and style preference. The *Historic District Standards* do not always prohibit window replacement, however the goals in the rehabilitation of windows are to retain the size and shape of the original openings so that the configuration of the facade is not changed, and to retain, repair, or duplicate the original materials of the windows.

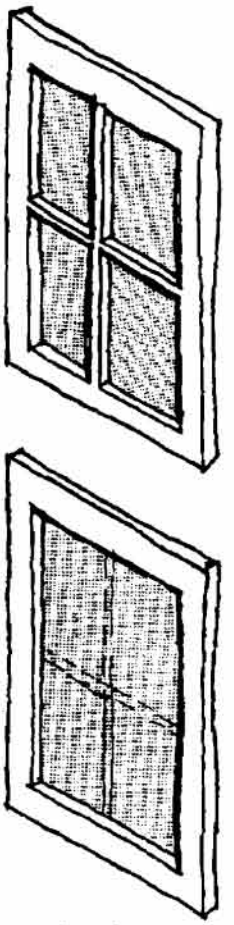
Window Terminology



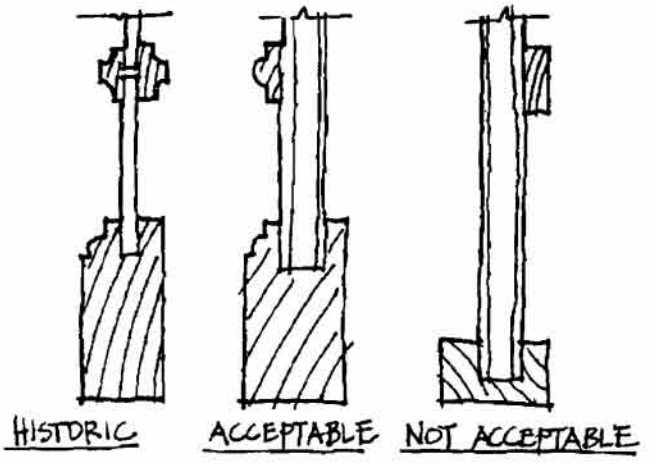
Window Guidelines

- Whenever possible, retain and repair existing window openings including the window sash, glass, lintels, sills, architraves, shutters, hoods, and all hardware.
- Do not introduce new window openings into the principal elevations or enlarge or reduce window openings to fit new stock window sash sizes.
- Replace deteriorated window parts by duplicating the material, design, and hardware of the older window. (See Preservation Brief #9, *The Repair of Historic Wood Windows*, for more information.)
- Consider epoxy consolidation of material in order to keep it in place.
- Do not install security grilles over historic windows.

- Do not install replacement windows flush with the outside wall. Install them in the same relationship as the original sash to the exterior wall.
- Install visually unobtrusive storms or interior storm windows that do not damage existing frames and that can be removed in the future.
- Retain and repair existing original window sash whenever possible. If windows are beyond repair, then any replacement window must match the design, size, proportions, and profile of the existing original windows.
- If vinyl or aluminum clad replacement windows are approved by the Historic District Commission, chose windows that match the size, proportions, and profiles of the existing windows.
- Do not install inappropriate new window features such as aluminum storm and screen windows, insulating glass that requires the removal of original windows, awnings made of plastic or metal stripping, or fake shutters that detract from the character and appearance of the building.
- Do not use tinted or mirrored glass.
- Do not use interior grilles, or grilles between layers of insulating glass in lieu of true divided lights or exterior muntins.



Muntins on the inside, or between layers of glass do not cast shadows like muntins on the exterior. Glare on the glass makes the muntins harder to see. Interior muntins are not an acceptable replacement.



The profiles of replacement sash should match the original. The middle solution is acceptable, even with the added insulating glass and slight variationof the muntin profile. The solution at right is not acceptable because the sash size and profile is significantly different and muntins are on the interior.

Metal

Pressed metal ornament came into common use on commercial storefronts and some residential designs in the late nineteenth century. Stamped metal forms could be purchased "off-the-shelf" and applied to facades to inexpensively simulate carved stone. Uses ranged from cornices to complete building facades. These elements were usually of galvanized sheet metal, and were painted.

Cast metal ornament, most commonly cast iron, also came into popularity in the nineteenth century. Although there are no examples of cast iron facades in Northville, there are some small decorative elements and railings remaining.

Metal Guidelines

- Galvanized metal guidelines have already been covered in the Metal Roofing section, and those guidelines may also be applied to pressed metal ornament.
- Clean using methods that do not abrade the surface.
- Do not expose metals (for instance by stripping away paint) that were intended to be protected from the environment.
- Do not use cleaning methods that alter the color or texture of the metal.
- Cast iron ornament must be protected from rust by painting. Cast iron is very brittle, and is consequently subject to damage by impact. Broken cast iron can be welded, however it is a very difficult process, and should only be undertaken by individuals with demonstrated experience in such repairs. Replacement with substitute materials such as cast aluminum may be a more viable alternative. Several companies offer cast aluminum reproductions of historic cast iron decorative objects such as lamp posts and railings.

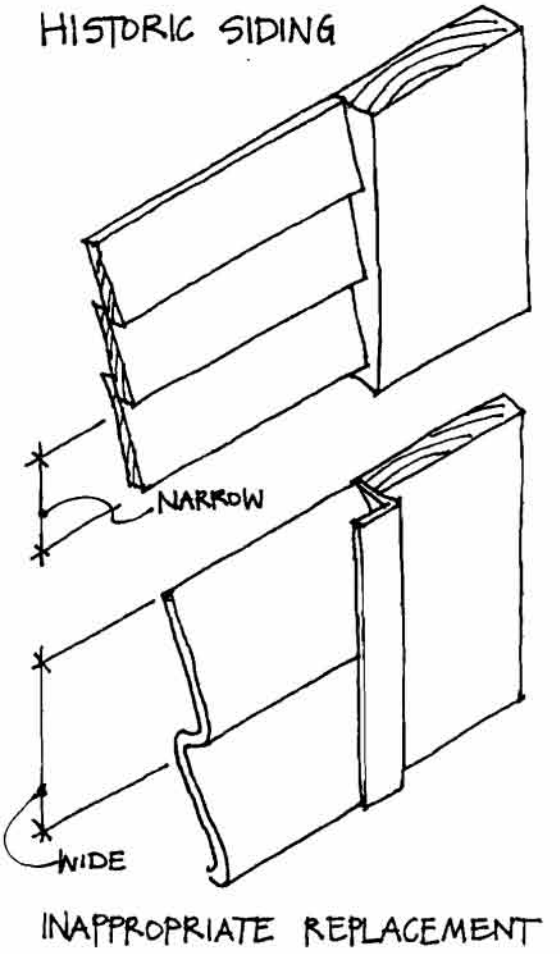
Vinyl, Aluminum, and Asbestos Siding

Installation of new vinyl and aluminum siding is prohibited in the district. Applicants can petition the HDC for an exception. Replacement siding is detrimental to historic aesthetics and materials. The aesthetic problem with substitute siding is that it covers or alters original details. (Refer to "Preserving Historic Residential Buildings" for more on this topic.) There are a number of technical pitfalls associated with siding as well. The siding can trap moist air in the wall if it is not properly vented. The moisture condenses, and accelerates deterioration of the covered materials. Open seams or holes can funnel rain water into the cavity resulting in wood rot or spalling masonry. Insects and rodents can live and proliferate in the small protected spaces.

Asbestos shingles, installed at time when asbestos was not known to be a hazardous material, are a particular hardship for a building owner, and this is recognized by the Historic District Commission. Removal and disposal of the material must be performed by a licensed asbestos abatement contractor.

Siding Guidelines

- Don't install substitute siding over historic building materials.
- Remove substitute siding and restore the original cladding if possible.
- Vinyl and aluminum siding are not permitted in the historic district. Applicants may petition the HDC for an exception.
- If substitute siding is permitted, hire a reputable contractor. Ask about how the siding will be vented. Ask about weep holes (holes through which condensation can drain out of the cavity).
- Covering details, or removing details in order to install siding is not permitted.
- Don't attempt to remove or cut asbestos shingles yourself.



The historic siding has a narrow exposure and a crisp profile. The siding butts up to a corner board. The inappropriate replacement has a wide exposure and a rounded profile. The siding is capped by a trim piece that projects in front of the corner board.

Paint

The obvious function of paint is to provide decoration and color. Additionally, many elements of the historic facade require painting to prevent deterioration. These include wood siding, metal decorations, metal flashing, wood decoration, wood windows, and decorative metal. Unpainted brick and stone should not be painted. In order for paint to serve as a protective coating, it must adhere to the substrate.

Proper application on wood includes:

Removal of all loose paint using scrapers, brushes, or chemicals
Cleaning the surface
Filling cracks or holes
Replacement or consolidation of decayed wood
Sanding
Thorough drying
Application of primer by brushing, rolling, or spraying
Application of one or two finish coats by brushing, rolling, or spraying
Painting in dry weather, at temperatures indicated by manufacturer
Repainting with the same type of paint previously used (latex or oil)

Proper application on brick includes:

Removal of all loose paint using water wash or chemicals (*never* sandblasting)
Cleaning efflorescence (mineral deposits) off the surface
Tuckpointing or repointing if necessary
Thorough drying
Application of primer by brushing, rolling, or spraying
Application of one or two finish coats by brushing, rolling, or spraying
Painting in dry weather, at temperatures indicated by manufacturer
Repainting with the same type of paint previously used (latex or oil)

Color Selection

Historic District Commission review is not required for one-color schemes with one contrasting trim color, yet color choice is an important part of the restoration design. Some owners may like to research the original historic colors and repaint using them. Others will prefer to select colors that are appropriate to the building and the neighborhood. If there is existing historic paint remaining, or evidence of the historic color, repainting to match the historic colors is encouraged.

Color experts recommended no more than three colors, including the color of any natural brick. The first color to be selected is the "base color," which is the color of the facade wall. If the wall is unpainted brick, the choice is already made—the color of the brick. The second color is the major trim, which is used for the defining decorative elements including the cornices, brackets, window and door frames. A minor trim color can also be selected to accent the architectural details such as the window and door sashes. The minor trim color is usually a darker shade of the major trim color. Many paint manufacturers have a historic or heritage color line which is organized according to historic period. (See Preservation Brief #10, *Exterior Paint Problems on Historic Woodwork*, and Part 8, "References," for further sources of information.)

Interiors

Interiors of historic buildings are not subject to review by the Historic District Commission. *The Secretary of the Interior Standards* discourage radical floor plan changes that diminish the historic character of a building. Sensitive treatment of historic interiors is encouraged whenever possible. (See Preservation Brief #18, *Rehabilitating Interiors in Historic Buildings*, and the list of resources in Part 8.)

Where original architectural features can be retained, they will reward the owner for they have lasting value and meaning in relation to the rest of the structure. Examples are stairs, elevators, handrails, balusters, ornamental columns, cornices, base boards, doors, doorways, windows, mantelpieces, paneling, lighting fixtures, parquet, and mosaic flooring.

An owner who wishes to recreate the original character of the building will want to retain the basic floor plan and even discover the original paint colors, wallpapers, and other decorative motifs. Another owner may be satisfied to retain only a few suggestions, or none at all.

Successful and code compliant rehabilitation for modern reuse sometimes requires the shifting of stairways and walls, the addition of barrier free restrooms, widening door openings, replacing door hardware, etc. Many of these issues are discussed in Part 6, "Codes and Building Systems."