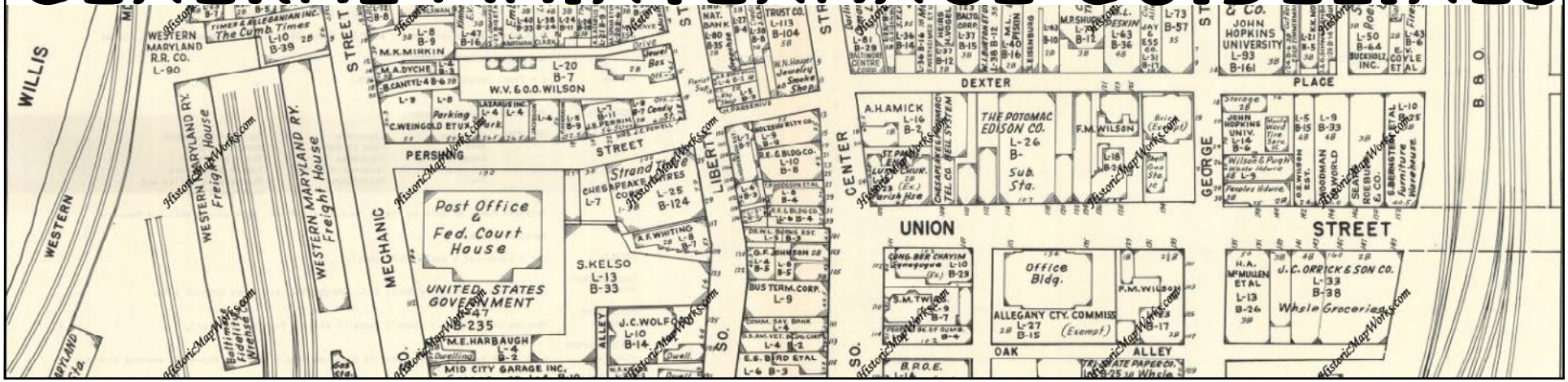
APPENDIX A

GENERAL MAINTENANCE GUIDELINES



Maintenance Guidelines

One of the primary preservation principles emphasized in these guidelines is the maintenance and repair of existing historic material. To the extent possible, property owners are encouraged to retain the material original to the construction of their building. When this is not possible, careful repair and conservative replacement should be done to restore the historic building to its historic design.

Property owners do not need to seek approval from the Historic Preservation Commission for general maintenance activities on their buildings (replacement does require approval). The best way to preserve your historic building and avoid costly replacement is with regular maintenance using methods involving the least amount of intervention. Often the simplest and cheapest approaches, such as a good cleaning of a masonry wall with mild soap and water, are overlooked in favor of costly and complex high tech methods. Many historic buildings have been rehabilitated by well intentioned but uninformed owners and contractors, which has resulted in short term cost saving but larger long term costs in terms of material deterioration and consequent repair bills.

This chapter is intended to describe to the layman the processes involved in maintaining, repairing, or restoring masonry, wood, or metal features. To the owner, architect and contractor it recommends a series of materials to use (and not use) and procedures to follow. These should serve as the basis for contract document specifications, but should not be a substitute for them.

Masonry

Virtually all of the buildings in the downtown business district and many of the buildings in the historic residential neighborhoods are constructed of masonry (stone and/or brick).

CAUSES OF DETERIORATION

Moisture

Masonry is by its nature a porous material and it is natural for moisture to penetrate the surfaces of the material. Problems occur when this moisture is excessive, or when it becomes trapped within the wall beneath a layer of sealant or paint, or when soluble salts from the masonry or the mortar itself are dissolved and redeposited on, or just beneath, the surface of the wall. Masonry materials of high porosity and low strength are particularly vulnerable to deterioration caused by moisture.

Rising damp can be a problem causing deterioration of masonry units at the base of a building just above the ground. This condition can be noticed usually by an area of masonry made darker by moisture above which a line of white colored efflorescence often appears.

Efflorescence on other parts of a wall may help to identify the location of a problem. The condition of the roof flashing, gutters and downspouts should be checked for leaks. Moisture can also enter a building because of improperly tooled or deteriorated mortar joints, caulking, sealants, and other details in the wall itself. In addition, recent changes in interior uses, or in the nature of insulation or interior finishes may result in condensation inside the wall, appearing as efflorescence on the surface. (New masonry, particularly if laid with conventional mortars rich in Portland cement, is subject to efflorescence during the first year or so.) The application of sealers and paint to a brick wall

can also serve to trap moisture not only causing the paint surface to fail, but also causing "blowing off" of the surface of the softer bricks. Masonry should be protected from excessive moisture by proper flashing and overhangs. The application of sealers or impermeable paints to previously unpainted surfaces should not be done without the professional advice of a conservator.

Hard Mortar with Soft Brick or Stone

One of the most common errors in maintenance and renovation work on historic masonry buildings is the use of Portland cement-based mortar. Mortars with large amounts of Portland cement have a compressive strength which is commonly much greater than the surrounding brick or stone. Rather than serving to strengthen the wall, they can cause rapid deterioration for a number of reasons. As a masonry wall expands from hotter temperatures, hard mortar tends to cause a concentration of loads on repointed joints, often causing a fracturing (spalling) of the edges of brick or a crumbling of stone.

Historic lime based mortars are softer, and allow the building to expand (and contract). Cement mortars also shrink and crack, whereas lime mortar is able to reseal itself through the slow movement of its components. Finally, cement mortar is less permeable than historic mortars or masonry, thus forcing moisture to penetrate the adjacent brick or stone. This makes the masonry subject both to efflorescence and damage by freezing. Mortar for repainting or rebuilding masonry should never be stronger than the masonry units themselves. It is a common mistake to assume that hardness or high strength is a measure of durability. A good starting point for most buildings constructed in the 19th century is a repointing mortar mix containing a ratio of 3:4:8 (Portland cement: lime: sand).

PREPARING FOR REPAIR WORK

Problems such as leaking gutters, downspouts, flashing, or vapor penetration from the inside should be identified and repaired before working on the masonry itself.

If the building is to be cleaned, this too should occur before minor repair work or repointing. This will enable a better evaluation of the extent of the damage and the proper matching of materials for repairs. On the other hand, problems extensive enough to permit water or chemical intrusion into the wall cavity itself during cleaning should be dealt with on a localized basis prior to cleaning. Then the building should be cleaned and the remaining masonry repaired or replaced, and repointed as required.

CLEANING AND PAINT REMOVAL

For a thorough introduction to the cleaning of masonry structures, refer to "Preservation Brief 1: The Cleaning and Waterproof Coating of Masonry Buildings" and "Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings," published by the Preservation Assistance Division of the National Park Service. These sources should be consulted before work is undertaken.

The improper cleaning of masonry is a major cause of deterioration of historic buildings. While it may yield positive short-term visual effects, the action can lead to irrevocable material damage. Few buildings, if any, require cleaning in their entirety. The most important guideline is that cleaning should not be undertaken unless necessary to remove excessive localized staining, or a deteriorating paint surface. Cleaning should never be used to remove the natural patina which gives older structures their visual interest and quality.

If it is decided to clean the building, the nature and source of the dirt

must be identified, and a series of patch tests conducted to determine the most effective yet least harmful method of cleaning. Proper evaluation of these tests requires a decision on the level of cleanliness desired. A "brand new" appearance is generally inappropriate for an older building and requires overly harsh cleaning methods. Always use the gentlest means possible:

1. *Water*: Low pressure water from a garden hose and use of a natural bristle brush is the preferred method, followed by the use of a mild nontoxic detergent. These often overlooked, simple, cheap, and non-polluting methods are surprisingly effective.

2. *Chemicals*: Chemicals should only be considered after it has been proved soap and water will not work. They are available in a wide range of types with rather specific uses. It is important that all chemicals under consideration are thoroughly tested and allowed to weather in excess of one month to insure that there are no negative side effects, such as discoloration or erosion of the base material. Special precautions must be taken to safeguard adjacent property and parts of the building not being cleaned from chemical pollution.

3. *Mechanical Methods*: Methods using sandblasting, grinders, or sanding disks should never be used. No matter how skilled the operator, erosion of the surface will take place giving it an unsightly appearance and leaving it significantly more susceptible to erosion.

4. *Poultices*: Localized, hard to remove problems such as rust, spray paint, or other deep penetrating stains may be removed by using a poultice. A poultice is made by mixing a solvent with an absorbent material such as talcum, Fuller's Earth, or Whiting to form a paste which is then held in place in a manner that allows evaporation of the solvent. As the process proceeds, the stain is slowly drawn out of the stone and deposited in the absorbent material ("Pampers," or shredded paper are often used). The process may need to be repeated several times and may not be 100% effective.

5. *Removal of Mastic*: In many instances, mastic will have been used to attach newer materials onto the masonry, making it difficult to remove and often leaving stains. If the mastic has become brittle, it may be possible to simply pop it off using a flat chisel, but care must be taken to avoid breaking off part of the surface of the masonry along with it. Chemicals such as acetone can sometimes be used to soften the mastic and allow it to be scraped off. Care should be taken to keep the process from staining surrounding masonry. Applying a poultice a second time may prove effective for removing the remaining stains. If the stains are severe and prove impossible to remove, it may become necessary to replace the damaged stone or brick.

REPOINTING

Repointing is a time consuming, labor intensive and therefore expensive task that is of vital importance for the protection of the building. Poor mortar joints left unattended will lead to much more costly and damaging problems such as the failure of sections of brickwork, or moisture penetration into the interior of the building. Only those areas which require repointing should be repointed. Repointing of the entire facade of a building, especially with a new joint profile, should be avoided.

The following comments are condensed from "Preservation Brief: 2", published by the Preservation Assistance Division of the National Park Service.

Visual Examination

All repointing work on historic masonry buildings should be preceded by an analysis of the mortar and by an examination of the bricks and

the techniques used in the original construction of the wall. For most projects, a simple visual analysis of the historic mortar is sufficient to allow an appropriate match for the new mortar. The exact physical and chemical properties of the historic mortar are not of major significance as long as the new mortar:

» matches the historic mortar in color, texture, and detailing;

» is softer (measured in compressive strength) than the brick;

» is as soft, or softer (measured in compressive strength) than the historic mortar.

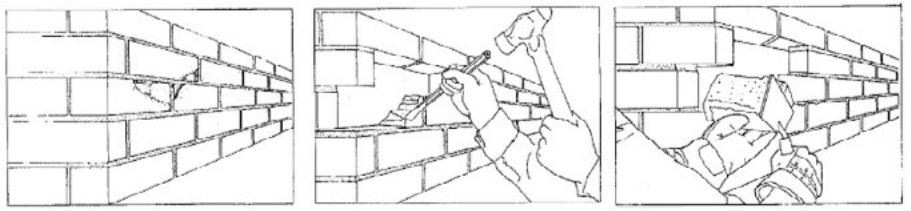
A simple method of analyzing the historic mortar to aid in developing an appropriate repointing mortar for many restoration jobs and most rehabilitation work is outlined in the full document "Preservation Brief: 2".

Historic sand was not screened or graded by size as it is today. Therefore, when specifying sand for repointing mortar, consideration may need to be given to obtaining sand from several sources and then combining them in order to approximate the range of sand colors and grain sizes in the historic mortar sample. Pointing styles and the methods of producing them should be examined. It is important to look at both the horizontal and the vertical joints to determine the order in which they were tooled and whether they were the same style. Pointing styles often differed from one facade to another. Front walls often received greater attention to mortar detailing than side and rear walls.

Masonry Replacement

Replacement brick should match the full range of the historic brick rather than a single brick. Within a wall there may be a surprising range of colors, textures, and sizes, particularly with hand-made brick. Although many bricks can be matched from existing stock, they must often be custom-ordered, a lengthy process that can seriously affect the project budget and schedule. The use of recycled brick from demolished buildings for replacement brick often results in an excellent color and texture match; however, it is important to remember that historic brick was manufactured in varying grades, ranging from high-fired exterior brick to low-fired interior "bat" or "clinker" brick. This low-fired brick was never intended to be exposed to the weather, and, when used for replacement brick on an exterior wall, will deteriorate at a rapid rate, often needing replacement within a year or two. Great care, therefore, should be taken in choosing the proper type of recycled brick.

Replacement of large areas of masonry are to be discouraged. Even with a close material match and careful craftsmanship, it will be very difficult to replace a large section of brickwork without affecting the appearance of the building.



Masonry replacement

Properties of Mortar

In general, mortars for repointing should be softer (measured in compressive strength) than the masonry units and no harder than the historic mortar. This is necessary to prevent damage to the masonry units. It is a common error to assume that hardness or high strength is a measure of durability. Stresses within a wall caused by expansion, contraction, moisture migration, or settlement must be accommodated in some manner; in a masonry wall, these stresses should be relieved by the mortar rather than by the bricks. A mortar that is stronger or harder than the bricks will not "give", thus causing the stresses to be relieved through the bricks, resulting in cracking and spalling. Stresses can also break the bond between the mortar and the brick, permitting water to penetrate the resulting hairline cracks.

Matching Color and Texture of Mortar

In matching the repointing mortar, the new mortar should match the unweathered interior portions of the historic mortar. The simplest way to check the match is to make a small sample of the proposed mix and allow it to cure; this sample is then broken open and the broken surface is compared with the broken surface of the largest "saved" sample of historic mortar. If it is not possible to obtain a proper color match through the use of natural materials because locally available sands are not a close match to the original sand, it may be necessary to use a modern mortar pigment, and, in fact, some historic mortars did use such additives. Pigments are available as separate ingredients or already mixed with mortar; however, the premixed mortars normally are not suited for use on repointing projects because of their high Portland cement content. Only chemically pure mineral oxides, which are alkali-proof and sun-fast, should be used in order to prevent bleaching and fading.

Execution of the Work

It is seldom necessary to repoint an entire wall of a building. Only those areas in actual need of repointing should be done.

The first step is to thoroughly and carefully clean mortar joints requiring work to a depth of approximately 1" using hand tools only. Power tools such as saws, impact hammers, or disk grinders inevitably result in damaging the brick and should be prohibited.

Just prior to repointing, the joints should be rinsed with a jet of water. At the time of filling, the joints should be damp, but with no standing water present. To minimize shrinkage and insure waterproof joints, they should be filled in 1/4" increments allowing them time between to begin setting up before the next layer is added. When the final layer is thumb print hard, the joint should be tooled to match the historic joint. The mortar should be slightly recessed so as to avoid a visual widening of the joint.

Patching

Many buildings retain their old iron fittings which were used to support awnings, signs or other fixtures. If not seriously obtrusive, these should be retained whenever possible. If they have corroded to the point of damaging the surrounding masonry, they should be removed with great care. Usually the fittings will be anchored in the masonry joints between bricks and will be fairly easy to remove and then repointed. Occasionally, however, they will be anchored directly into a brick or stone necessitating partial removal of the masonry itself. Holes in the stonework may be patched with a composite patching compound manufactured specifically for that purpose. Test samples should be made to insure a close match in color. Poorly done patching can affect the entire appearance of the building.

Treatment of Exposed Party Walls

Often interior walls were built of brick which was inadequately burned in the kiln, and thus is too soft to withstand the weather. Such brick will tend to be easily penetrated by moisture, and eventually suffer from spalling and decay caused by freezing. The mortar may also be very rough, which would tend to leave many channels for the entry of water into the building. The owner should inspect the wall to determine its condition, noting such things as the hardness of the brick, the density and evenness of the mortar, and the overall ability of the wall to shed water.

If the brick is sound, but the mortar is too rough, the joints should be raked out by hand, and repointed in a way compatible with the historic character of the building.

If the brick is soft, or otherwise too rough to be left exposed, a decision has to be made whether the wall should be 1) repointed, 2) resurfaced with an entirely new width of bricks over the old surface, or 3) covered with stucco.

Wood

CAUSES OF DETERIORATION

Most problems with wood are caused by moisture, insect attack, or excessive wear. All the problem areas should be identified, their causes determined, and the proper steps taken to repair them. Paint failure should not be mistakenly interpreted as a sign that the wood is in poor condition and therefore unable to be repaired. The wood itself is frequently in sound condition beneath unsightly paint or only in need of slight repair. To test for the soundness of wood, poke the areas in question with an ice pick or awl and lift up. Decayed wood lifts up in short irregular pieces, while sound wood separates in long fibrous splinters.

The following recommendations are adapted from "Preservation Briefs: 9, 10, & 11", published by the Preservation Assistance Division of the National Park Service. These sources should be consulted before work is undertaken.

REPAIR AND REPLACEMENT

Partially decayed wood can be patched, built up, chemically treated or consolidated and then painted to achieve a sound condition, good appearance, and greatly extended life. To repair wood showing signs of rot, it is advisable to dry the wood; remove all paint, wood filler, and caulking; carefully apply a fungicide such as pentachlorophenol (a highly toxic substance) to all decayed areas; then treat with two or three applications of boiled linseed oil (24 hours between applications). Afterward, fill cracks and holes with putty; caulk the joints between the various wooden members; and finally prime and paint the surface. Partially decayed wood may also be strengthened and stabilized by consolidation, using semi-rigid epoxies which saturate porous decayed wood and then harden. The consolidated wood can then be filled with a semi-rigid epoxy patching compound, sanded and painted.

Where wood components are so badly deteriorated that they cannot be stabilized, it is possible to replace the deteriorated parts with new pieces. These techniques all require skill and some expense, and can be accomplished by cutting the decayed piece back to sound wood; splicing in a new piece, using a waterproof resorcinol-formaldehyde glue, and shaping and sanding the new piece to match the old exactly. In some cases, missing edges can be filled and rebuilt using wood putty or epoxy compounds. When the epoxy cures, it can be sanded smooth and painted with an oil-based primer and two coats of paint to achieve a durable and waterproof repair.

Storefront Reconstruction in Wood

An unfortunate trend in storefront design is the construction of a plywood pseudo Victorian shop front. They are often constructed poorly, using plywood butt-end joints in the horizontal and vertical directions. Within two years, one can usually find that the paint at every joint has separated from the wood and begun to curl, exposing raw wood. In time the plywood will begin to warp at these joints and pull away from the supporting structure. There is unfortunately no cure for this problem. In essence, plywood has been asked to substitute for cast iron or solid pieces of wood that historically left no exposed joints.

Wood siding traditionally has repelled water through overlapping shingles, or capped siding, vertical siding with tongue and groove joints, or vertical siding with butted joints covered by wood battens, each backed by wood sheathing. Even Texture 111 plywood should utilize 2"x 4" blocking at horizontal seams which in turn should employ vertical shiplap joints or galvanized or aluminum flashing. Vertical joints in Texture 111 plywood are normally either shiplapped with the stud acting as a reverse board and batten, or covered with a vertical batten. Where these techniques are ignored, water will penetrate and

the facade will have to be replaced at significant cost. The preferred way to construct these "piers" and fascia is to use solid wood pieces cut to appropriate lengths and sealed in an acceptable fashion. Molding strips should be primed on the back as well as front surfaces. While the initial cost will be higher for such an installation, the cost is more than amortized over the life of the storefront.

Repainting

Wood has historically been painted to deter the harmful effects of weathering (moisture, UV rays from the sun, wind, etc.) as well as to define and accent architectural features. Repainting exterior woodwork is thus an inexpensive way to provide continued protection from weathering and to give a fresh and historically compatible appearance to the building.

Removal and Repair

As a general rule, removing paint from historic exterior woodwork should be avoided unless absolutely essential. For example, conditions such as mildew, excessive chalking, or staining (from the oxidization of rusting nails or metal anchorage devices) generally require only thorough surface cleaning prior to repainting. Inner-coat peeling, solvent blistering, and wrinkling require removal of the affected layer using mild abrasive methods such as hand scraping and sanding. If there are many scraped areas where thick paint layers leave an edge, these may be "feathered" or flattened using an orbital sander.

In all of these cases of limited paint deterioration, after proper surface preparation the exterior woodwork may be given one or more coats of a high quality exterior oil finish paint. If painted wood surfaces display continuous patterns of deep cracks or if they are extensively blistered and peeling so that bare wood is visible, the old paint should be completely removed before repainting. (Peeling to bare wood - the most common type of paint problem - is most often caused by excess interior or exterior moisture that collects behind the paint film. The first step in treating peeling is to locate and remove the source of moisture. If this is not done, the new paint will simply peel off).

Acceptable methods for total paint removal include such thermal devices as an electric heat plate with scraper for flat surfaces such as siding, window sills and doors, or an electric hot-air gun with profiled scraper for solid decorative elements, such as gingerbread or molding. Open flame "blow torches," however, should never be used. Chemical methods play a more limited, supplemental role in removing paint from historic exterior woodwork; for example, caustic or solvent-base strippers may be used to remove paint from window muntins where thermal devices could easily break the glass. Detachable wooden elements such as exterior shutters, balusters and columns, can probably best be stripped by means of immersion in commercial dip tanks because other methods are too laborious. All elements should be clearly marked to insure that they can be returned to their proper places. Care must be taken in rinsing all chemical residue off the wood prior to painting or the new paint will not adhere.

If the exterior woodwork has been stripped to bare wood, priming should take place within 48 hours (unless the wood is wet, in which case it should be permitted to dry before painting); application of a high quality oil type exterior primer will provide a surface over which either an oil or latex top coat can be successfully used.

Metals

Metal is found in the decorative cornices and brackets of the Victorian and early 20th century storefronts. As with wood, all metal architectural features, such as columns, capitals, window hoods, cornices, storefronts, etc., should be identified, retained and preserved along with their finishes.

Prior to starting any work, it is necessary to identify any problems causing deterioration and repair them. It must also be determined what metal each element is made of and its conditions so a proper treatment can be prescribed. Architectural elements were fabricated using cast iron, bronze, copper, tin, galvanized sheet iron, cast zinc, and stainless steel. Determining metallic composition can be a difficult process, especially if components are encrusted with paint.

Most of the historic metalwork in Cumberland is either cast iron or galvanized sheet iron, although bronze can be found in a few turn of the century buildings and aluminum appears on storefronts commencing in the 1930's. The following comments are based upon "Preservation Brief: 11", published by the Preservation Assistance Division of the National Park Service and upon field experience.

GALVANIZED METALS

The cornices of commercial buildings are often in the style of the Italian Renaissance or some other classical revival style. Reflecting as they do the changing tastes of late 19th century America, they are usually more imaginative than historically accurate. While they are often thought to be wood or stone, nearly all of them are actually made of thin sheets of galvanized iron or sheet steel, bent and hammered into three-dimensional architectural forms. The galvanizing is a coating of zinc applied to prevent rusting. The stamped sheets are usually fastened to wooden backing with small-headed nails. To clean stamped sheet metal, you can use a rotary wire brush inserted in an electric drill. For details this should be supplemented by a hand-held wire brush, paint scraper, and a gouging tool like a pen knife. Don't try to shake off loose paint by banging on the metal, for this may break old solder joints. Unlike cast iron, never allow stamped metal or galvanized sheet iron to be sandblasted.

Clean the surface of paint flakes and dust. An air compressor and hose like that used for spray painting is the quickest and most thorough method. One can also use a clean, dry paint brush, a rag, or even a vacuum cleaner. Special zinc paints must be used as a primer before painting the outer coats. (Rustoleum, a rust-inhibiting primer often used, is not a good choice). Be sure that the primer used is compatible with the finish paint. If possible, prime the back of the metal also. Paint with two finish coats of flat, oil base, alkyd paint. Flat paint is now thought to be the longer lasting, and its non-glare quality also helps bring out the designs in the stamped metal. Stamped metal facades were usually painted a single color, resembling stone. Tans or grays were used, sprinkled with sand to give a more stone-like appearance.

BRONZE

Bronze storefronts can be cleaned by a variety of methods; since all cleaning removes some surface metal and patina, it should be undertaken only with good reason (such as the need to remove encrusted salts, bird droppings or dirt). Excessive cleaning can remove the texture and finish of the metal.

Since this patina can protect the bronze from further corrosion, it should, as a rule, be retained wherever possible. If it is desirable to remove the patina to restore the original surface of the bronze, several cleaning methods can be used: chemical compounds including rottenstone and oil, whiting and ammonia, or precipitate chalk and ammonia, can be rubbed onto bronze surfaces with a soft, clean cloth

with little or no damage. A number of commercial cleaning companies successfully use a combination of 5% oxalic acid solution together with finely ground India pumice power. Fine glass-bead blasting (or peeling) and crushed walnut shell blasting also can be acceptable mechanical methods if carried out in controlled circumstances under low (80-100 psi) pressure. Care should be taken to protect any adjacent wood or masonry from the blasting. Other metals such as lead, copper, and zinc should likewise not be cleaned in that they develop their own protective patina with age.

CAST IRON

Cast iron storefronts are usually encrusted with layers of paint which need to be removed to restore crispness to the details. Where paint build-up and rust are not severe problems, hand scraping and wire-brushing are viable cleaning methods. While it is necessary to remove all rust before repainting, it is not necessary to remove all paint. For situations involving extensive paint buildup and corrosion, mechanical method such as low-pressure gentle dray grit blasting (80-100 psi) can be effective and economical, providing a good surface for paint. Masonry and wood surfaces adjacent to the cleaning areas, however, should be protected to avoid inadvertent damage from the blasting. It will be necessary to recaulk and putty the heads of screws and bolts after grit blasting to prevent moisture from entering the joints.

Cleaned areas should be painted immediately after cleaning with a rust-inhibiting primer to prevent new corrosion. Before any cleaning is undertaken, local codes should be checked to ensure compliance with environmental safety requirements. Storefronts utilizing softer metals (lead, tin) sheet metals (sheet copper), and plated metals (tin and terneplate) should not be cleaned mechanically (grit blasting) because their plating or finish can be easily abraded and damaged. It is usually preferable to clean these softer metals with a chemical (acid pickling or phosphate dipping) method. Once the surface of the metal has been cleaned of all corrosion, grease, and dirt, a rust-inhibiting primer coat should be applied. Finish coats especially formulated for metals, consisting of lacquers, varnishes, enamels or special coatings, can be applied once the primer has dried. Primer and finish coats should be selected for chemical compatibility with the particular metal in question.

METAL REPAIR AND REPLACEMENT

The nature of the repair will depend on the extent of the deterioration, the type of metal and its location, and the overall cost of such repairs. Patches can be used to mend, cover, or fill a deteriorated area. Such patches should be a close match to the original material to prevent galvanic corrosion. Splicing (replacement of a small section with new material) should be undertaken on structural members only when temporary bracing has been constructed to carry the load. Reinforcing (bracing the damaged element with additional new metal material) can relieve fatigue or overloading in some situations.

To refasten loose metal components, use long dip-galvanized nails with small stove-bolt heads in order to avoid a mixture of metals that may set up a corrosive electrolytic reaction. At the same time, check the wooden backing material; if water, dry rot, or termites have weakened it, it will be necessary to remove some of the stamped metal sheets and rebuild the wooden sections. The top of the storefront should be securely flashed to keep water from seeping behind the metal. Flashing should be of galvanized metal. Caulk all seams between components with long-lasting architectural-grade oil based caulk. Sometimes, an architectural element may be completely missing or too deteriorated to be repaired, and must therefore be replaced. Many metal elements were mass produced and it may be possible to find a compatible component in a salvage yard.

Failing this, reproduction is the next step. Metal elements can be made in their original materials such as cast iron or galvanized sheet metal. Reproduction of cast iron units is often difficult and expensive. Less costly methods that have proven successful employ such materials as aluminum, wood, and plastic (using vacuum-formed process similar to that used by sign makers today), painted to match the metal. Simple sheet metal forms can be recreated at a sheet metal shop. Complicated details can be done by removing an existing piece that matches the missing one, making a plaster mold of it, then using the mold to create a fiberglass replica.

At some point, if substantial sections of the original storefront are missing or damaged beyond repair, particularly where inadequate documentation of the original condition exists, a decision based upon cost and historical accuracy will need to be made as to whether to attempt a recreation or to compose a proportionally compatible, but contemporary storefront. This decision should be based upon the criteria set forth in the commercial storefront section of these guidelines.