CITY OF NEW ORLEANS
Historic District Landmarks Commission

Guidelines for Masonry and Stucco

Masonry and Stucco

Exterior masonry includes stone, brick and stucco. Historically, a building's exterior masonry surface serves both visual and functional purposes. Visually it is an important design feature that establishes the rhythm and scale of a building. Historic exterior masonry:

- Acts as an important design feature, helping to define a building's architectural style
- Establishes a building's scale, mass and proportion
- Adds pattern and casts shadows on wall surfaces

Functionally, historic exterior masonry typically acts as the principal load bearing system for the building, as well as its "skin", shedding water and typically deflects sunlight and wind. Historic exterior masonry:

- Acts as a principal element in the structural system
- Establishes a weather-tight enclosure, providing protection from rain, wind and sun

Section Index

The HDLC reviews all modifications to exterior masonry and stucco. This section includes:

All applicants must obtain a Certificate of Appropriateness (CofA) as well as all necessary permits prior to proceeding with any work. Please review this information during the early stages of planning your project. Familiarity with this material can assist in moving a project quickly through the approval process, saving applicants both time and money. Staff review of all details is required to ensure proposed work is appropriate to the specific property.

Additional *Guidelines* addressing other historic building topics are available at the HDLC office and on its web site at www.nola.gov. For more information, to clarify whether a proposed project requires Historic District Landmarks Commission (HDLC) review, to obtain property ratings or permit applications, please call the HDLC at (504) 658-7040.

Using These *Guidelines*

The first step in using these Guidelines is to understand the rating. The rating corresponds to the historical and/or architectural significance of properties and determines what will be permitted within local Historic Districts or at local Landmarks under the jurisdiction of the HDLC.

S *Significant Properties – Retain the highest degree of architectural and historical merit.*

C *Contributing Properties – Contribute to the overall District and city character.*

N *Non-Contributing Properties – Do not contribute to the overall District character.*

Types Of Masonry and Stucco in New Orleans

The photographs below represent some common types of masonry and stucco found in New Orleans. For more information on the care and maintenance of local brick, please refer to the *"Vieux Carré Masonry Maintenance Guidelines"* published by the Vieux Carré Commission.

19th Century Brick *–A soft, fired-clay, fairly regularly shaped building component; often with color and surface variations; used primarily in walls, piers, foundations and exterior pavers.*

20th Century Brick *–A hard, dense, fired-clay, regularly shaped building component; sometimes with a glazed surface; used primarily in walls, piers, foundations and exterior pavers.*

Wire Cut Brick *–A dense, fired-clay, regularly shaped building component; with a ridged surface; used primarily in 20th century building walls.*

Limestone *– A sedimentary rock; used for building walls, window sills and lintels, ornamental stone trim, sculpture and for producing lime.*

Granite *– A hard rock, consisting of small, yet visible, grains of minerals, which can be highly polished or textured; used for walls, piers and street curbs; commonly in gray, black and pink.*

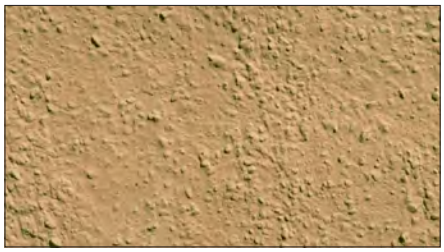
Marble *– Typically fine grained and able to be highly polished; it has a wide range of colors and patterns; used for steps and stoops, statuary and fine masonry.*

Terra Cotta *– Fired-clay, non-structural building components, often with colored glaze, used for decorative, ornate details and wall finishes.*

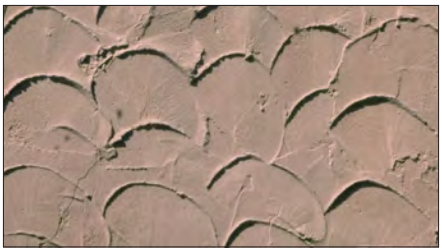
Concrete Block *– A structural building material made by mixing water, cement, sand and aggregate, placing the mix in forms and hardening; commonly used for foundations, walls and piers.*

Textured Concrete Block *– A structural building material made by mixing water, cement, sand and aggregate, placing it in forms and hardening; commonly used for foundations, walls and piers, popular in the early to mid-20th century.*

Scored Stucco *– Smooth finish with scoring to simulate stone joints.*

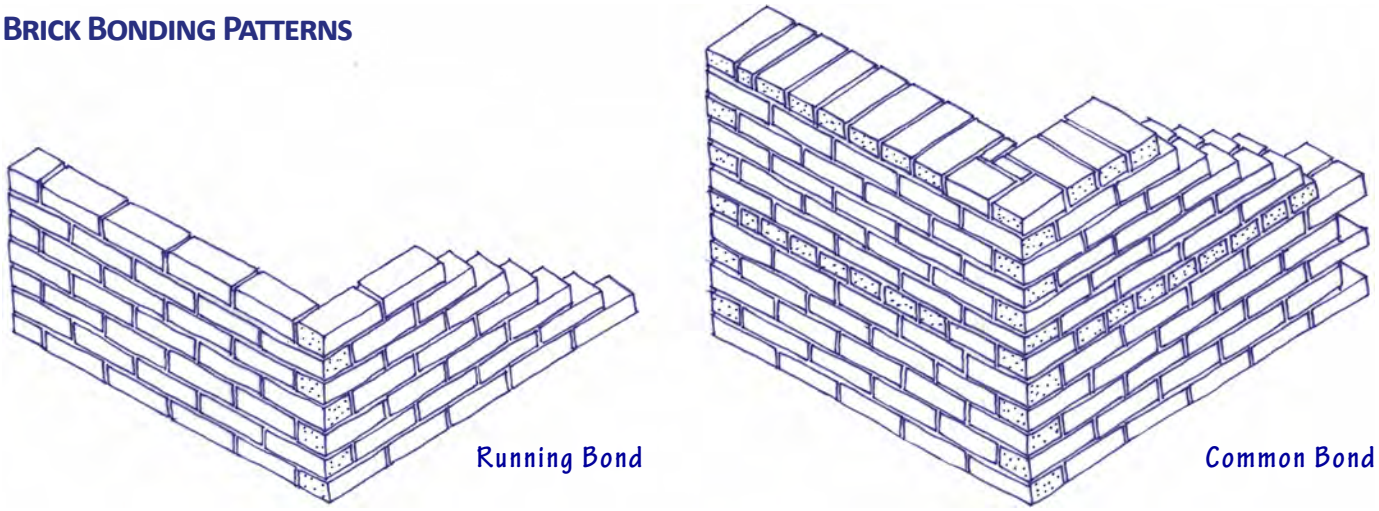


Dash Finish Stucco *– Textured finish with pronounced aggregate at the surface.*



Trowel Finish Stucco *– Highly stylized finish with pronounced ridges and shadows from trowel application.*

Brick Bonding Patterns



The most frequently constructed brick bonding pattern is common bond, which is built of stretcher courses with header course every sixth row. Another familiar bonding pattern is running bond, comprised only of stretcher courses.

Components of Masonry Walls and Piers

Masonry walls and piers were historically constructed of either bricks or stones, stacked on top of each other. The individual units are bonded by mortar, which serves to hold the masonry units together and fill the gaps between them. Historically the masonry was bearing, meaning it carried its own weight to the ground as well as the load of other building elements such as walls, floors and roofs.

Bricks

Brick is by far the most common masonry material in New Orleans and can be found at some of the City's earliest buildings as well as those constructed today. Bricks are made by inserting clay into a mold and then firing or baking the brick at very high heat. The result is a standardized unit, generally 8" by 4" by 2-1/4" in size.

The color of brick can vary, but red is by far the most common. Other colors include yellow, orange and brown. The color is determined by the chemical and mineral content of the clay, and the temperature and conditions of the kiln or oven. Similar to the color, the strength or hardness of brick is determined by the clay ingredients and the firing method, but it is also affected by the way the brick is manufactured.

- Lake bricks, also known as mud bricks, tend to be very soft and can be found on buildings and structures built during the 19th century. They were made by pressing wet clay into a wood or metal mold, historically by hand; the shaped clay was dried and then fired. In the process, small air pockets and impurities were trapped in the clay, and the bricks were often slightly irregularly shaped with holes or voids and rounded edges and corners. Because lake bricks are very soft, they were often covered with stucco to protect them from the weather.
- Dry pressed bricks are similar to lake bricks except the clay used is drier, is pressed into the molds with greater force and fired longer. The result is a harder brick with sharper corners and edges. Dry pressed bricks gained in popularity in the second half of the 19th century.
- Extruded bricks were popularized in the early 20th century and are the hardest bricks. Unlike mud bricks and dry pressed bricks which tended to be made near the construction site, extruded bricks are typically made in large factories and shipped to the site. To make extruded bricks, very dry clay is forced through a form to create a long ribbon before being cut into individual bricks. With large-scale production it is easier to achieve higher quality control of the color and hardness.
- Veneer bricks are thin layers of bricks, often about 1/4" thick, adhered to an underlying surface. Brick veneers have no structural capacity.

Concrete Masonry Units

Concrete masonry units (CMUs), also known as concrete blocks, are similar to bricks in that they are formed structural elements. They are made by mixing water, cement, sand and aggregate, which is placed in forms to harden. The blocks are typically 8" by 8" by 16" in size and typically include voids. Similar to brick, they are typically stacked and bonded with mortar. They are most often laid in a running-bond pattern, and should not remain exposed in historic settings. Instead, CMU walls should be parged or stuccoed when visible from a public way.

Stone

Stone buildings are relatively rare due to the lack of local building stone. The most common type of stone in New Orleans is granite piers and lintels found on Greek Revival buildings. Historically, stone walls and piers were weight bearing and constructed of individual stone units bonded with mortar. In the mid 20th century, stone veneers were popularized, which are thin slabs of masonry, (typically marble or granite) "hung" on an underlying structural support system.

MORTAR

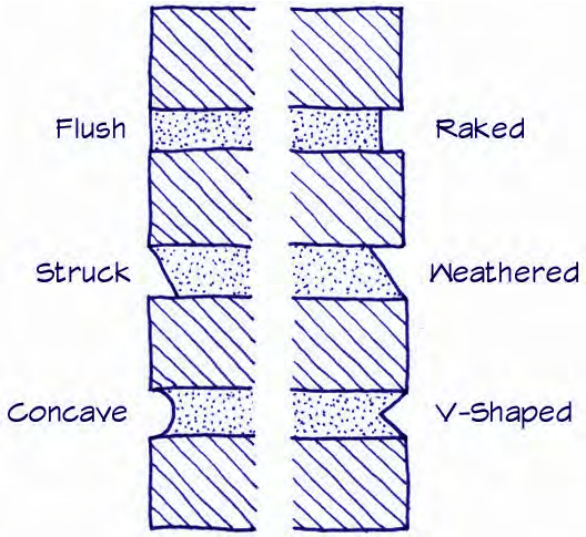
Historically, mortar was generally composed of a few ingredients: sand, lime and water, and possibly additives such as animal hair or oyster shells. Starting in the mid-19th century, a small amount of Portland cement was added into the mix to improve the workability and hasten the setting time. In the early 20th century, the amount of Portland cement in mortar was increased, resulting in harder mortar corresponding with the manufacturing of harder bricks.

Sand is by far the largest component of mortar and defines its color, character and texture. Since masons would use products that were readily available, sand from historic mortars tended to have weathered, rounded edges and was available in a great variety of grain sizes and shades of white, grey and yellow. Most sand available today has sharper edges from being mechanically broken and is sieved into standard sizes. As a result, mixing sand colors and sizes might be needed to match historic mortar.

Lime and Portland Cement act as binders for the mortar. High lime mortar is soft, porous and varies little in volume with seasonal temperature fluctuations. Because lime is slightly water-soluble, high-lime mortars can be self-healing and reseal hairline cracks. By contrast, Portland cement can be extremely hard, resistant to water movement, shrinks significantly upon setting and undergoes relatively large thermal movements. Portland cement is available in white or grey, and the two colors can be mixed to achieve a desired color. **In general, high lime mortars are recommended for nearly all repointing projects at 18th and 19th century construction to ensure a good bond with original mortar and masonry.** It is possible to add a small percentage of Portland cement to a high lime mixture to improve workability and plasticity. Portland cement can generally be increased when repointing 20th century buildings or structures.

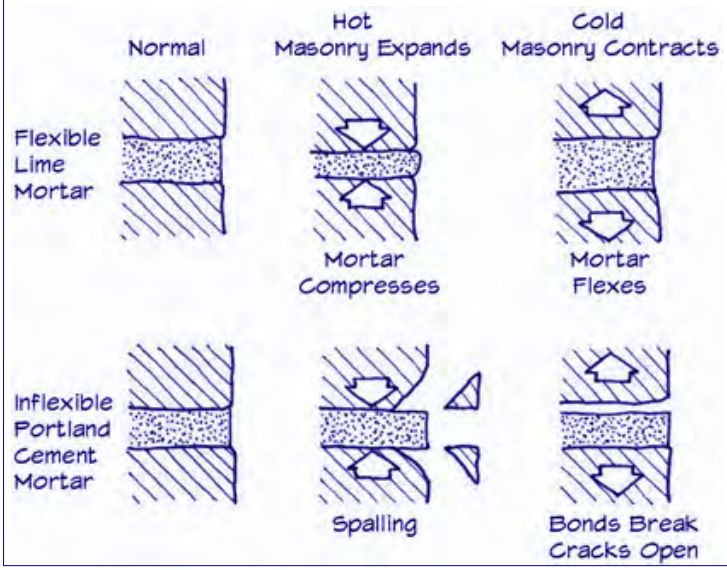
Water needs to be clean and free of salts, harmful minerals and acid. If not, it can break down the mortar and adjacent masonry and discolor finished surfaces.

Historic Additives included oyster shells, animal hair, clay particles, etc. To duplicate the character of historic mortar, it might be necessary to include additives to match the original. (Refer to Page 07-9 for mortar analysis information.) It should be noted that there are several types of chemical additives available today including those that increase or reduce the setting time or expand the recommended temperature installation ranges. The use of newer chemical additives is strongly discouraged unless they have been specifically tested over an extended period of time with similar historic materials as the proposed installation conditions.



There are numerous joint profile types, with each producing different shadow lines and highlights. When repointing an area of masonry, it is important to tool the mortar to match the existing joint profile for a consistent appearance.

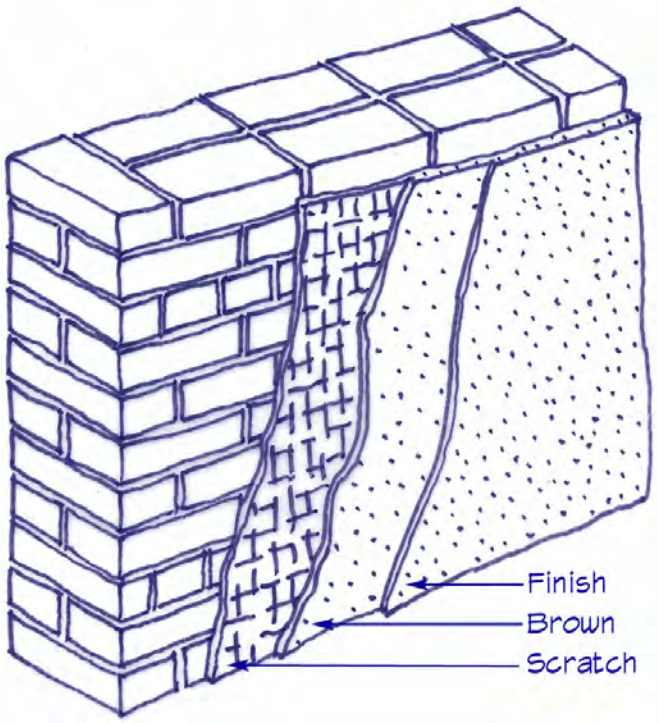
MORTAR HARDNESS AND MASONRY



Temperature changes cause masonry units to expand when heated and contract when cold. The expansion and contraction of the masonry units results in compression and flexing of the adjacent mortar joints.

Lime based mortar is pliable and is more likely to compress and flex through temperature cycles. If properly installed, it should also be softer than the adjacent masonry.

Portland cement based mortars are significantly harder than lime based mortars and far less elastic. In addition, cement mortars tend to be substantially harder than historic masonry. When masonry units expand in warm temperatures, they press against the harder cement mortar and tend to spall at the edges. During colder temperatures, masonry units tend to pull away from mortar, resulting in open cracks that can allow moisture penetration.



Traditionally stucco was applied in 3 layers; the scratch, brown and finish coats.

Stucco

Stucco is a relatively inexpensive material that can provide a more finished appearance to brick, stone or wood framed buildings. In some cases, the surface was scored to look like stone. It acts as a weather repellent coating, protecting the building from the elements including rain, snow, sunlight and wind, and can moderately increase its fire resistance. Stucco can also provide an insulating layer to a wall, reducing the passage of air, as well as improve a building's fire resistance.

In New Orleans, stucco was traditionally applied at the time of construction over "lake brick" as a protective coating. Beginning in the 20th century, it was also applied on wood framed buildings in revival styles of architecture. It was also applied on some buildings and structures, years after the original construction, as a remodeling material to vary the original appearance or to conceal deterioration.

The components of stucco are similar to pointing mortar and include sand, lime, Portland cement, water, and possible binders like animal hair or straw. In some cases, pigments were added to the mix, to alter the finished color.

Stucco Application

Stucco is essentially a layer of mortar held in position by the bond formed with the underlying material. Historically at masonry walls, one of the best ways to achieve a bond was to "rake-out" the mortar joints about 1/2" to form a groove that holds the stucco in place. (Refer to *Raked Joint* at *Joint Profiles*, Page 07-4.) When installed on masonry, stucco becomes an integral part of the wall when it sets. When stucco was installed historically on wood framed walls, the stucco was generally "hung" on strips of wood called lath that were nailed to wall studs. By the mid 20th century metal lath replaced wood lath for stucco application on wood framed buildings.

A stucco wall surface is generally about 1" thick and applied in the following 3 coats:

- The **Scratch Coat** is approximately 3/8" thick and applied directly to the wall surface. It is forced into the raked joints or pushed into the lath to provide a strong bond. The surface of the scratch coat is deeply cross scratched to allow bonding of the brown coat.
- The **Brown Coat** is also approximately 3/8" thick and finished with a wood float for a smoother surface.
- The **Finish Coat** is generally about 1/4" thick with the overall thickness being determined by the finish style.

Synthetic Stucco

The Exterior Insulation and Finish System, or EIFS, is a synthetic stucco system that was popularized in the United States in the late 20th century. It generally consists of 3 layers:

- An inner foam insulation board secured to the exterior wall surface, often with adhesive
- A middle polymer and cement base coat that is reinforced with glass fiber mesh
- An exterior textured finish coat

One of the significant problems with EIFS is that it does not "breathe" and can trap moisture within the wall thickness. This can lead to powdering or melting of soft lake bricks and rotting of wood sills and framing. If the problem persists, mold and mildew can develop in the building, providing a desirable home for termites.

Although the surface of EIFS can be finished to match many types of stucco, there are some differences. In larger areas of wall surface, EIFS is typically installed with control joints or grooves to allow the surface to expand and contract with temperature changes. These joints are typically not needed with lime based stucco and can result in odd wall patterns. Also, EIFS if properly installed should not come in contact with roofing, wood trim or porch and gallery floors to reduce the possibility of moisture infiltration. Instead, these joints are often filled with sealant that can crack and eventually allow moisture to penetrate.

Because of the differences in the visual characteristics of EIFS from stucco and the potential to harm historic building fabric, the HDLC does not permit the application of synthetic stucco or EIFS at any Significant or Contributing building or structure.

Typical Masonry And Stucco Problems [1]

Many problems associated with historic masonry result from the failure to keep masonry mortar joints or stucco coatings in good repair. Deteriorated mortar joints and stucco surfaces allow moisture to penetrate the masonry and cause severe interior and exterior damage. There are five principal causes of mortar joint and stucco failure:

- **Weathering** of mortar or stucco occurs when rain, wind and pollution erode softer historic mortar over time. (Historic mortar and stucco was purposely soft to allow the masonry wall to expand and contract with seasonal temperature changes.)
- **Uneven Settling** of masonry walls and piers may result in cracks of stucco surfaces, along masonry joints or within masonry units.
- **Temperature Cycles** can cause masonry, stucco and mortar to expand and contract at different rates, breaking the masonry's bond with the stucco and mortar. This situation can be worsened if moisture enters an open joint, then freezes and expands, potentially popping out the surface of the stucco, mortar and the masonry, also known as spalling.
- **Poor Original Design and Materials** can cause ongoing problems if the masonry and mortar are incompatible or inappropriate for their installation location, or if the masonry does not properly shed water. Lake brick, which is very soft, erodes if exposed to the elements and not protected by lime-based stucco.
- **Insufficient Exterior Maintenance** may result in water entering a masonry wall and accelerate deterioration. Potential areas of concern are: poorly functioning gutters, downspouts and flashing; rising damp from saturated soil; standing water at foundations; water splashing back off hard surfaces onto walls; or water-entrapping vegetation such as vines or shrubs on or near masonry walls, foundations, piers, chimneys, etc.

Definitions:

Efflorescence: Water-soluble salts leached out of masonry or concrete by capillary action and deposited on a surface by evaporation, usually as a white, powdery surface

Spalling: Chipping of masonry

1 These *Guidelines* are intended to provide an overview of masonry issues and potential repairs. The care of masonry, particularly "lake brick", requires specialized professional knowledge, which is outside of the scope of these *Guidelines*. Please refer to the "Vieux Carré Masonry Maintenance Guidelines" published by the Vieux Carré Commission for additional information.

What to Look for

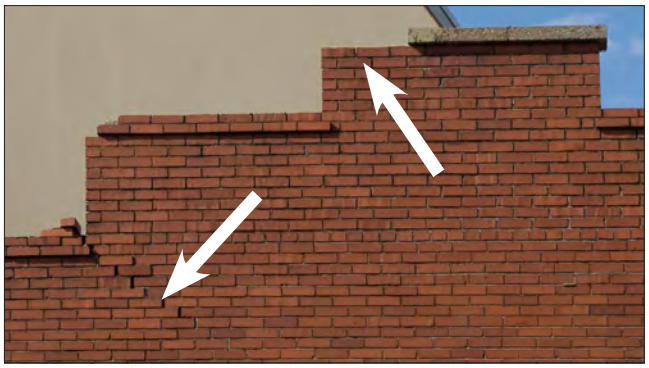
It is important to identify masonry problems early to minimize damage. This is particularly true of masonry that is exposed to moisture. Once water is permitted to penetrate a masonry wall, the rate of deterioration accelerates very quickly, becoming more severe and costly. The following images include some typical masonry problems in New Orleans and possible repairs. Specific conditions might require professional evaluation by an architect or engineer, particularly settlement issues.

Deterioration of bricks and mortar at chain wall – *The surface of the bricks appear to be "melting" suggesting they are lake bricks. The mortar between the bricks is also eroding, increasing the potential for moisture infiltration.*

Recommendation – *Most chain walls, particularly those made from soft lake bricks should have a protective stucco coating. Replace missing brick. Repoint open joints with compatible mortar, as soon as possible, to minimize storm water entering wall. Apply compatible 3-coat stucco. Verify that the ground is sloping down away from the building and storm water is not pooling next to the foundation.*

Open joints at brick pier – *The mortar is missing in the brick pier joints. This may be an indication of settlement or movement in the building.*

Recommendation – *Review the wall structure above the pier to verify whether the wood structure has shifted or is bulging or misaligned in response to pier movement. Repoint mortar joints with compatible mortar. Inspect pier every 3 to 4 months to see if joint has reopened, which would likely suggest the movement is still occurring.*

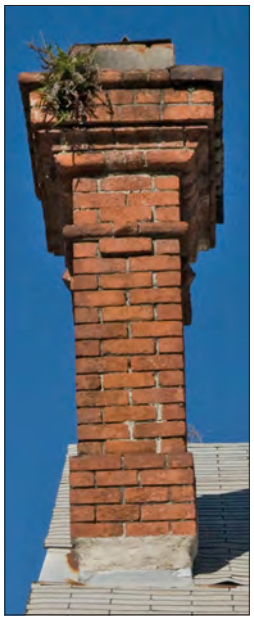


Missing parapet cap stone, stepped crack at wall – *Part of the cast stone cap stone is missing at the top of the wall and there is a step crack following the mortar joints that suggests building movement.*

Recommendation – *Review wall structure to verify whether it has shifted or is bulging in response to movement or settlement. Repoint mortar joints with compatible mortar and install new matching cap stone to keep water from entering the top of the wall. Inspect crack every few months to see if joint has reopened, which suggests the movement is still occurring.*

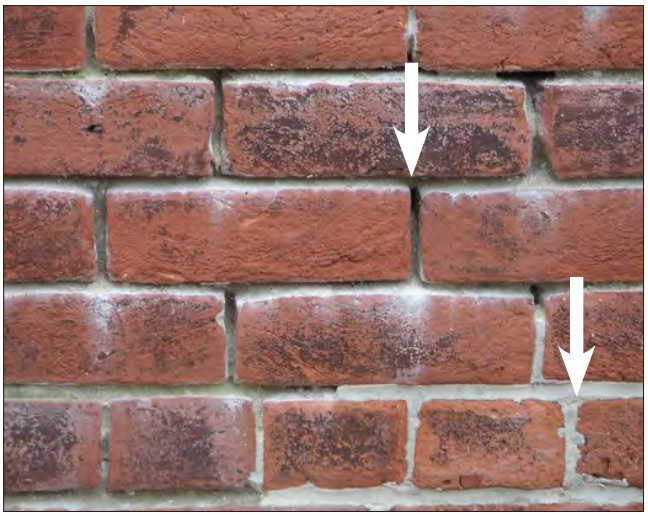
Plant growth and staining at downspout– *Plants are growing in the mortar joints around the top of the downspout and there is dark brick staining below. Both conditions suggest the presence of moisture and saturation of the brick wall.*

Recommendation –*Verify that the downspout is clear and draining. Remove plant growth. Repoint open mortar joints with compatible mortar.*



Leaning chimney– *The chimney is leaning and has deteriorated bricks and eroded mortar.*

Recommendation – *Review chimney structure to verify whether it has shifted significantly and requires rebuilding to match existing. Remove plant growth. Repoint mortar joints with compatible mortar and install inverted "V" chimney cap or mortar wash at top of chimney to reduce water infiltration. Inspect crack every 3 to 4 months to see if joint has reopened, which would suggest continuing movement.*



Disintegration of mortar from masonry surface – *The mortar between the bricks has deteriorated particularly at the vertical joints, increasing the potential for moisture infiltration. The area at the lower right of the photograph has been recently repointed and mortar smeared into joints rather than properly tooled.*

Recommendation – *Repoint open joints with compatible mortar as soon as possible to minimize storm water entering wall. Consider repointing lower right section to ensure a tight bond with compatible mortar.*

Masonry infill areas – *The brick infill area is clearly visible. The infill area uses bricks of a different size and color than the historic bricks and is outlined by a thicker mortar joint rather than being "keyed" into the adjacent brickwork.*

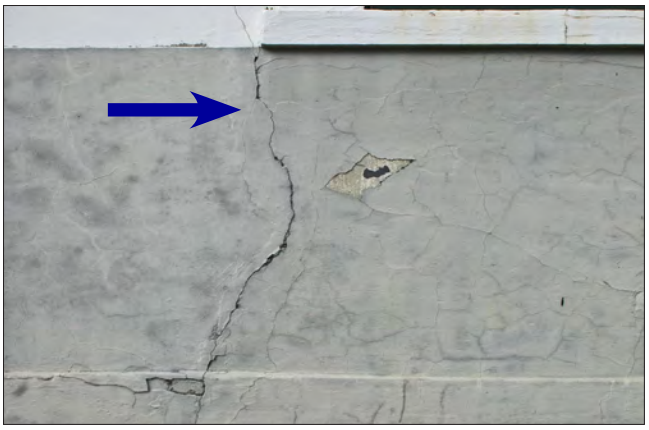
Recommendation – *The bricks and mortar used in the infill areas should be the same size, color, texture, appearance, profile and hardness as the adjacent historic bricks. The repair should also be "toothed" into the adjacent brick to appear continuous with the wall surface.*

Plant growth in stucco crack – *The cracks in the stucco are supporting plant growth suggesting moisture in walls. Also note the rusting lintel above the door.*

Recommendation – *The lintel is likely expanding due to the rust. Repair lintel, remove plants, repair crack and apply lime based masonry paint for a uniform appearance.*

Algae growth at stucco foundation – *The algae along the foundation suggests significant moisture in the ground immediately next to the building. Continued moisture can cause the stucco to delaminate, and fall off the wall.*

Recommendation – *Verify that the slope of the ground next to the foundation is draining away from the building and that no downspouts are discharging next to the area. Clean stucco and if required apply lime based masonry paint for a uniform appearance.*

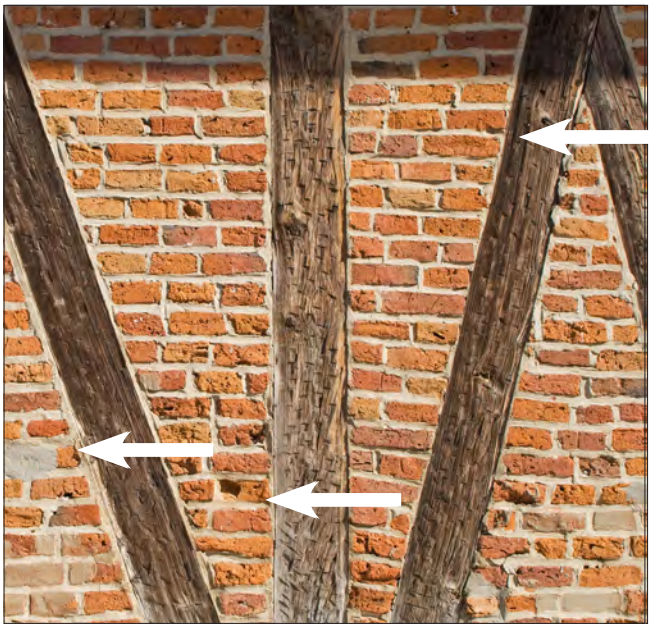


Stucco cracking– *The crack from the window sill might be an indication of building movement.*

Recommendation – *Review wall for other signs of movement and/or settlement. Repair crack and apply lime based masonry paint for a uniform appearance.*

Stucco removed near roof – *Stucco was often used as a less expensive means of achieving the prominence and grandeur of masonry. In this example, the stucco was scored to resemble stones and molded to form the details of the window surrounds and cornice. The failure of the stucco has exposed the soft, underlying brick to the elements.*

Recommendation – *Verify whether there is a roof drainage issue that caused the stucco to fail. Apply compatible stucco to match historic profiles and finish and lime based masonry paint for a uniform appearance.*



Stucco removed at brick between post construction – *The removal of the stucco has exposed the soft, underlying brick to the elements. The brick is deteriorating quickly. Note the spalling and delamination of the brick surfaces, open joints and stucco patches replacing prior bricks.*

Recommendation – *Apply compatible stucco and lime based masonry paint for a uniform appearance.*

Repointing Historic Masonry

Repointing work can last at least 50 years when completed properly. However, it can be time consuming and expensive. Repointing requires a great deal of hand labor by skilled craftsmen to remove the existing mortar without damaging adjacent masonry, achieve the appropriate mortar mix and hardness, apply the mortar, and tool it to match the historic joint style and appearance. As a result, it is generally recommended that repointing projects be limited to areas of deterioration rather than an entire building.

To achieve the best results, repointing work is best completed when the temperature ranges between 40˚F and 90˚F for at least two days after the installation of the mortar to help the mortar bond to the masonry. Mortar should be placed in joints in layers of no more than 3/8" thick and allowed to harden. The final layer should be tooled to match the historic joint profile.

Spalling of the masonry surface – *The center brick surface has spalled. The repointing mortar likely includes too much Portland cement and is harder than the bricks. The mortar should be removed and replaced with soft mortar.*

Widened and extended joints – *A power tool was used to cut-out the joints during repointing, extending vertical joints. The joints have also been widened and are too large.*

Matching Historic Mortar and Stucco

Most pre-mixed mortar available from hardware stores is generally inappropriate for historic masonry as it contains too much Portland cement and is too hard. The most exact method of matching historic mortar and stucco is to have it analyzed by a professional lab. However, there are several mortar mixes provided in the "Vieux Carré Masonry Guidelines" published by the Vieux Carré Commission. The HDLC is also available to provide specific guidance based upon the type, location and condition of the masonry.

Patching Stucco

Similar to repointing mortar, stucco should be applied in moderate weather conditions, avoiding extreme heat, sun and freezing temperatures. The final appearance should duplicate the existing as closely as possible in strength, composition, color and texture. Successful patching of stucco surfaces generally requires the services of a skilled craftsman. Similar to stucco application, stucco repairs are applied in three coats. (Refer to Stucco, Page 07-5.) Similar to pointing mortar, if stucco patches are too hard, they could cause additional damage to the adjacent historic stucco surfaces or lead to the formation of cracks that can allow water migration into the wall.

When repairing stucco, hairline cracks can generally be filled with a thin slurry coat of the finish coat ingredients, while larger cracks need to be cut-out and prepared for a more extensive repair. Similarly, bulging wall surfaces need to be cut-out to a sound substrate. For the best appearance, the area to be patched should be squared off and terminated at a building joint or change in materials such as a window or door frame.

When applying stucco directly to a masonry wall, it is important to rake out the masonry joints to a sufficient depth to allow the stucco mortar to be bonded to the masonry and keyed into the joints. When applied to a wood framed building, the lath should be securely attached to the substrate. The use of metal lath at masonry buildings is strongly discouraged since it can be prone to rust and eventually lead to the spalling of the stucco surface unless it is galvanized.

The peeling paint is likely incompatible with the stucco or caused by moisture. Loose and flaking paint should be removed and the cause for failure addressed before repainting.

Painting Stucco

The HDLC encourages the painting of stucco with lime based masonry paint. Similar to lime based mortar and stucco, lime based paint is "flexible" and "breathes." By contrast, multiple coats of latex paint can act as a barrier, trapping moisture and eventually peeling.

Repaired stucco will often need to be repainted for a uniform appearance. When selecting paint, it is important that the new paint is compatible with earlier coats of paint and the stucco material, and applied following the manufacturer's recommendations.

The rough texture and uneven surface suggest that an aggressive cleaning method was used. Stucco patches replace bricks and efflorescence, a white powdery substance, can be seen on the surface.

Masonry Cleaning

Appropriate masonry cleaning can enhance the character and overall appearance of a building. However, improper cleaning of historic masonry can damage to the historic surfaces and cause more harm than good both physically and visually. Masonry cleaning methods fall within three general categories:

- Low pressure water, with the possible use of gentle detergent and brushing with a natural bristle brush
- Mechanical cleaning including sand blasting, power washing, grinding, sanding and wire brushing
- Chemical cleaning

Because of the potential damage to historic surfaces, cleaning should be completed only when absolutely necessary using the gentlest means possible. In many cases, soaking the masonry with low pressure water can remove much of the surface dirt and deposits. If the soaking method is not successful, it might be necessary to add a non-ionic detergent, such as dish washing detergent, or brush the wall surface with a natural bristle brush.

The use of mechanical methods, including abrasive blasting, power washing, sanding or grinding, can potentially remove decorative details and the protective surface of the masonry, resulting in an eroded surface and permanent damage. Abrasively cleaned masonry usually has a rougher surface that can hold additional dirt and be more difficult to clean in the future. Chemical cleaners can etch, stain, bleach or erode masonry surfaces. Both mechanical and chemical cleaning methods can destroy the protective layer, making the masonry surfaces more porous and deteriorate mortar joints, allowing for increased moisture penetration and acceleration of deterioration.

In instances where a severe stain or graffiti is present, it might be necessary to use a chemical cleaner in specific areas. Caution should be taken to test the effects of the proposed cleaner on a discrete area of the building before using it on a principal elevation. It is recommended that the most diluted possible concentration be used to minimize potential damage of the masonry surface. It should be noted that many chemical cleaners are hazardous and require special handling, collecting and appropriate disposal of the chemicals and rinse water.

Masonry Cleaning Guide

The HDLC Requires:

- Cleaning using the gentlest means possible
- Repointing prior to cleaning to ensure mortar joints are sound and building is water-tight before water cleaning – typically results will be more uniform
- Using clean water without excessive salts, acids, minerals or traces of iron or copper that can discolor masonry
- Conducting water cleaning a minimum of 1 month before freezing temperatures to minimize the potential for spalling
- Minimizing water pressure to reduce potential etching of masonry surfaces (generally no more than 100 psi)
- Using non-ionic detergent and natural bristle brushes when water soaking is not successful
- Hiring a contractor with specialized knowledge of masonry cleaning when gentler cleaning methods are not successful

The HDLC Discourages:

- Using chemical cleaning

The HDLC Does Not Permit:

- Cleaning with harsh chemicals, sand blasting, power washing, metal brushes or grinders that can damage the protective exposed surface

Masonry Coating

Water repellent and waterproof coatings are generally applied to prevent water from entering a masonry wall, but tend to be unnecessary on weather-tight historic buildings and problematic long term. Water infiltration through masonry buildings is often caused by other moisture related problems including open mortar joints and poor or deferred maintenance. In instances where the surface of the masonry has been severely compromised, such as sandblasted brick, the use of water repellent coatings might be appropriate.

Water Repellent Coatings, also referred to as "breathable" coatings, keep liquid from penetrating a surface but allow water vapor to escape. Many water repellent coatings are transparent or clear when applied, but might darken or discolor over time.

Waterproof Coatings seal surfaces and prevent water and vapor from permeating the surface. Generally, waterproof coatings are opaque or pigmented and some include bituminous coatings and some elastomeric coatings and paint. Waterproof coatings can trap moisture inside of a wall and can intensify damage. Trapped moisture can freeze, expand and spall masonry surfaces.

The peeling paint is likely incompatible with the brick or may be caused by moisture. The plant growth indicates moisture trapped in the wall. The paint should be removed.

Masonry and Stucco Painting

If the exterior of the masonry surface has been compromised through previous sandblasting, moisture infiltration or the use of harsh chemicals, appropriate painting can provide a degree of protection; however, applying stucco is typically the more appropriate option. Proper application of a water repellent paint can prevent water from penetrating while allowing water vapor to escape. Waterproof coatings or inappropriate paint can trap moisture within a masonry wall.

When repainting masonry or stucco, proper preparation is critical to a successful project and includes removal of vegetation and loose or flaking paint; maintenance of adjoining materials, such as leaking downspouts or gutters; and repointing of open joints. Finally, it is important to select a type of undercoat and paint that is appropriate for the type of masonry or surface coating on the building and apply them following manufacturer's recommendations.

Murals

Refer to *Murals, Guidelines for Exterior Woodwork*, page 06-16 for additional information.

Removing Paint from Masonry

When considering whether to remove paint from a masonry surface, it is important to determine whether removal is appropriate. In some instances the building might have been meant to be painted or paint was used to hide deterioration, later changes or additions. It might be appropriate to consider stripping paint if the existing paint has failed; the paint was applied to cover other problems such as a dirty building; or to reduce the long term maintenance requirements associated with repainting. Caution should be used since some older paints include lead, requiring proper collection and disposal techniques.

Signs of failed paint include paint that is badly chalking, flaking or peeling, possibly due to moisture penetration. Prior to repainting, it is recommended that the cause of the moisture infiltration be repaired to minimize the potential for future peeling. It is also prudent to review whether the masonry has been "sealed" by excessive layers of paint or by waterproof coatings. The underlying masonry might not be able to "breathe" and dispel the internal moisture and salts. Eventually, pressure from moisture and salts can build up under paint layers and possibly cause the paint to peel and masonry to spall.

If paint is stable, complete paint stripping might not be necessary. However, new paint should be compatible with previously paint layers and surface for best adhesion.

Masonry Coatings and Paint Guide

The HDLC Does Not Permit:

- Applying water repellent or waterproof coatings including paint that can trap moisture and prevent the wall from "breathing"
- Applying waterproof coatings on masonry above the surface grade level
- Painting previously unpainted historic brick or stone because the paint can: damage the historic masonry; alter the visual characteristic of the building and obscure the craftsmanship of the masonry including colors, texture, masonry and joint patterns; and paint on masonry is not easily removed

Hiring a Contractor

- The repair, maintenance, installation and cleaning of masonry and stucco can be potentially dangerous work and should be left to professionals
- All masons are not necessarily experienced in all materials; choose a contractor with demonstrated experience in working with historic masonry, verify warranty for materials and labor, check references to understand how well their work has held up
- Hold final payment, such as 25%-30% of the project cost, until all work has been properly completed

Masonry and Stucco Guide

The HDLC Requires:

- Replacement masonry that matches the historic in type, color, texture, size, shape, bonding pattern and compressive strength
- Repointing mortar or stucco of the same hardness or softer than the original mortar or stucco and always softer than the original masonry – typically of high lime content with limited Portland cement
- Using mortar and stucco that matches the appearance, color, texture, pattern, joint size and tooling of the historic mortar and stucco
- Replacement masonry toothed into existing masonry and continuing the adjacent pattern

The HDLC Recommends:

- Carefully removing algae, moss, vines and other vegetation from masonry and stucco walls and removing shrubs from the building perimeter
- Completing masonry and stucco work in fair weather

The HDLC Discourages:

- Using power tools to remove existing mortar from joints since they can damage historic masonry
- The use of modern chemical additives
- Installing pointing mortar in a single layer greater than 3/8" deep

The HDLC Does Not Permit:

- Widening or extending the existing mortar joints or overlapping the new mortar over the masonry surface
- Removal or covering of historic masonry surfaces or details
- Removal of historic stucco from masonry surfaces or from "brick between post" construction exposing the soft, underlying brick to the elements
- Creating or maintaining the appearance of delaminated stucco, exposing brick behind
- Installing stucco over brick, stone or wood framed buildings that were not intended to be stuccoed unless covering previously damaged masonry
- Installing modern brick for patching historic masonry, even if they are "antiqued", since they are generally much harder and do not match the historic masonry
- Exposing painted or unpainted concrete masonry units
- Using pre-mixed mortar or stucco that contains a high percentage of Portland cement
- Using pre-mixed mortar that does not match the appearance of the historic mortar

Masonry and Stucco Review

Install or replace masonry in-kind to match the hardness, size, color, pattern, texture and porosity with matching mortar joint

S C N HDLC Staff review.

Install inappropriate masonry

S C Commission review.

N HDLC Staff review.

Replace mortar in-kind to match the hardness, appearance, color, texture, tooling and mortar joint size

S C N HDLC Staff review.

Install inappropriate mortar

S C Commission review.

N HDLC Staff review.

Install or repair appropriate 3-coat traditional stucco of hardness, appearance, color and texture for the substrate and style

S C N HDLC Staff review.

Install other stucco including EIFS systems

S C Commission appeal.

N HDLC Staff review.

Paint stucco, repaint previously painted masonry or remove paint from masonry

S C N HDLC Staff review.

Apply coating or paint to previously unpainted brick or stone

S Commission appeal.

C N HDLC Staff review.

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