

MASONRY— BRICK AND STONE

The Least You Need to Know:

- Most brick and stone will require very little maintenance work. It is a very durable material and will generally not require extensive cleaning. In all cases, harsh methods such as sandblasting are NOT appropriate.
- Most problems with masonry come about because of deteriorated mortar joints. Missing or crumbling mortar joints allow moisture to get into the brick and stone causing further deterioration.
- The repointing of brick and stone should be done carefully and in consultant with a masonry expert. Please contact the Borough for advice and assistance.

Introduction

Brick and stone are used extensively in Mercersburg. The color and texture of individual bricks and stones, the pattern in which the units are laid, and the consistency, color, size, and shape of the mortar joints between the units all give character to masonry. Ornament and detailing in masonry contribute greatly to the character of a building. Although masonry is typically viewed as a very strong building material, excess water can literally turn it to dust. Other major causes of masonry deterioration include general neglect, improper maintenance, inappropriate repair, and harsh cleaning methods. The most common problems with masonry include the crumbling and flaking of individual bricks and



the loss or loosening of individual bricks. This type of deterioration is typically caused by excess moisture penetrating the masonry wall - a problem that is worse if the building was ever sandblasted. This removes the protective coating on the brick, exposing the softer interior and leading to more rapid deterioration.

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Cleaning Masonry

Masonry should be cleaned as needed by the gentlest means possible. This means non-abrasive low pressure water washes. A garden hose, soft nylon brush and a mild detergent will often be very effective.

If water washing cannot produce the desired result, proceed with chemical washing under the guidance of an experienced professional. Use the weakest possible solution and neutralize afterwards. Be sure to follow manufacturer's directions, particularly regarding the range of appropriate temperatures for working with chemicals, and the potential hazards.

Sandblasting is not allowed under any circumstances. Abrasive materials and tools remove the protective outer layer of brick and expose the soft inner area to moisture. Repeated years of freeze and thaw cycles can literally turn the brick to dust.



Sandblasting can remove the protective outer layer of brick allowing it to absorb moisture and quickly deteriorate.

Other Damaging Conditions for Masonry

Efflorescence: Efflorescence is a spotty, white haze appearing in a horizontal pattern in brick. It is created by salts that are deposited after water evaporates inside the wall and means there is excess moisture present. The moisture enters through a defect, or by rising damp, and then evaporates at the interior or exterior.

Rising Damp: Rising damp is the condition that exists when suction pulls groundwater into a masonry wall from the bottom up. Rising damp can result in spalling, efflorescence, and other deterioration.

Biological Growth: Mold, algae, fungus, and vegetation can grow on a masonry wall when excess moisture is present. The moisture may be a result of faulty caulking or mortar; cracks created by building settlement; faulty gutters, downspouts, and flashing; improperly ventilated interior spaces; or excessive shade. This growth encourages moisture to remain in the masonry, thus making it more susceptible to deterioration.

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Repointing

Mortar is composed of sand, water, and lime or Portland cement. Historic mortar may also contain ash, horse hair, oyster shells, or other additives. The process of using mortar to bond masonry units - brick or stone - to form a wall is called POINTING. REPOINTING is the process of removing deteriorated mortar and applying new mortar to restore the strength and appearance of the wall.

Repointing masonry where the mortar has deteriorated or is missing is a common repair. However, it requires a very careful mixture of ingredients to be sure that the new mortar matches the original. It is recommended that only an experienced mason undertake this type of work.

Always determine the appropriate mortar formula for historic masonry. Always test the existing mortar to determine its composition, then base the new mortar composition on the old. Mortar mixes historically are much softer than the current standard mixes available commercially today.

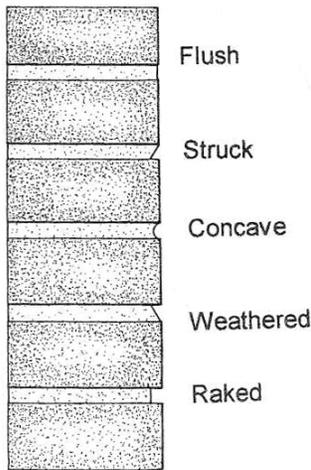
Mortar Types (Measured by volume)			
Designation	Cement	Hydrated Lime or Lime Putty	Sand
M	1	1/4	3 - 3 3/4
S	1	1/2	4 - 4 1/2
N	1	1	5 - 6
O	1	2	8 - 9
K	1	3	10 - 12
"L"	0	1	2 1/4 - 3

Suggested Mortar Types for Different Exposures			
Masonry Material	Exposure		
	Sheltered	Moderate	Severe
Very durable:	O	N	S
Moderately durable:	K	O	N
Minimally durable:	"L"	K	O

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Guidelines For Repointing

1. New mortar must match the strength of the historic mortar, and must be softer than the surrounding masonry.
2. Mortar to be used for repointing should match the original mortar in color, texture, and composition.
3. Sand color is critical to determining mortar color.
4. Although it will be time and labor intensive, use only hand tools for removing old mortar. Using power tools will damage the edges of the stone or brick. Remove mortar to a depth of 3/4 inch or deeper to reach sound mortar.
5. When flushing the joints after removing mortar, use as little water as possible in a gentle stream.



6. Copy the tooling method and detailing of the historic joints. Be aware that these details may change on different portions of the building. Check for joint profile on protected areas of the building, like under eaves, because weathering may alter the profile.
7. Avoid removing sound mortar to achieve a uniform appearance. Achieve a uniform appearance by properly analyzing the existing mortar and matching it to the original recipe in only the damaged area. New mortar of the historic recipe should weather to the color of the original.

NEVER

- use a synthetic caulking compound.
- use a mortar mixture with a Portland cement content higher than 20% of the total volume of lime and cement combined.
- use a mortar that is harder than the surrounding masonry.

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Should I Paint My Masonry?

The application of paint to previously unpainted brick, stone, or masonry buildings is usually inappropriate. The character of masonry is an important element of a historic building and the painting of these surfaces can alter the integrity of the building.

However, many old masonry buildings are made of soft bricks that were meant to be painted. Some were painted to hide poor quality brick or stone. Removing the paint from these buildings would drastically change their character and cause the bricks to erode.

If you are unsure whether or not your building should be painted, contact the Borough office for help.

* Drawings used with permission from Borough of Gettysburg.