EXTERIORS
BRICK

Rarely does brick as a material fail. The challenge is making sure it's supported properly, that it's securely tied to the structural wall, and that the measures have been taken to ensure that moisture won't affect the wood framing behind brick veneer.

ESTIMATING BRICK

Brick sizes vary widely, and so do the costs. When estimating and pricing brick, keep in mind that larger brick may cost more per unit, but it takes far fewer units to complete a job, and the job will require less sand and mortar.

To estimate the number of brick per 100 sq. ft. of wall, refer to Brick Veneer Coverage, below. Or use the following formula (for standard 8x21/4x33/4 brick with a standard 3/8-in. mortar joint):

1 Square Foot of Wall = 6.8 Brick

Wall Height (ft.) x Wall Length (ft.) x 6.8 = Total Brick Needed

FIGURE: BRICK VENEER COVERAGE (PER 100 SQ. FT.)

Mortar Joint (in.)	Brick	Wall Ties	Mortar Required (cu. ft.)
1/4	698	23	4.48
3/8	680	22	6.56
1/2	635	21	8.34
5/8	590	19	10.52
3/4	549	18	12.60

"Mortar Required" assumes 20% waste for all head and bed joints. The brick size assumed is 8 x 2 1/4 x 3 3/4 in. No waste is included for the brick.

EXPANSION JOINTS

Expansion joints in brick masonry will prevent cracking due to thermal movement, moisture-absorption, and load effects. Accumulated movements are usually not large enough in residential construction to warrant expansion joints. However, long walls (over 75 ft.) can have problems.

REPOINTING BRICK

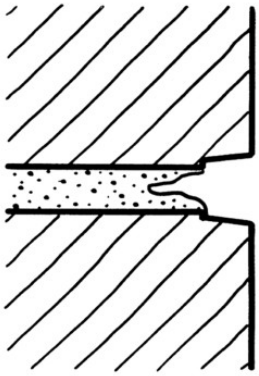
Old brickwork should be repointed to protect it from further damage. Once mortar joints begin to fail, the deterioration can accelerate damage to the brick itself and increase the likelihood of leaks.

Raking Out Mortar

Old mortar should be removed (using a hammer, chisel, and a tuck-point grinder or a pneumatic chisel) to a minimum depth of two-and-a-half times the width of the joint. A depth of about 1 in. deep usually will ensure an adequate bond. Any loose or disintegrated mortar beyond this depth also should be removed. Clean joints carefully; damage to bricks will affect the appearance, and also can lead to accelerated weather damage (Removing Mortar, below).

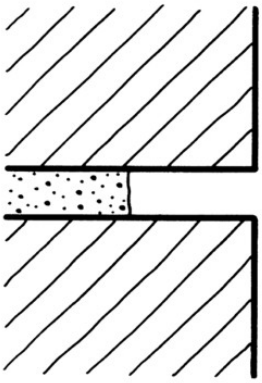
FIGURE: REMOVING MORTAR

Incorrect



Mortar is not cleaned out to a uniform depth. Edges of brick are damaged by tool or grinder, which creates a wider joint.

Correct



Mortar is cleaned out to a uniform depth — about 1" deep. Edges of brick are undamaged.

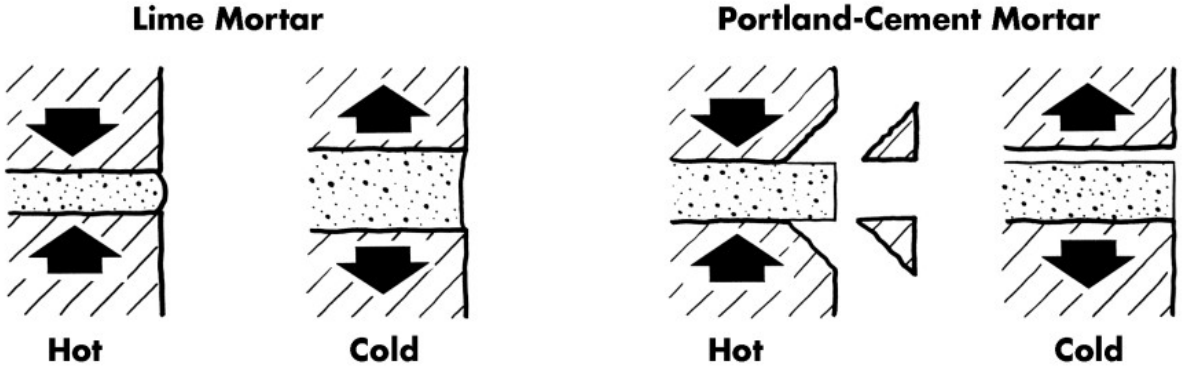
When raking joints, remove mortar to a uniform depth (above) for maximum bond of the new mortar, and take care not to damage the edges of the brick and create an uneven joint (top).

Tuck-Pointing

- Dampen the brick and old mortar before filling the joint to control the rate of hardening, but avoid free water or excessive wetting. Too much water will delay the tooling or cause excessive shrinkage; too little water will reduce bond strength.
- Use only prehydrated lime mortar for tuck-pointing. A hard, Portland cement mortar may cause the brick to spall (Lime vs. Cement Mortar, below). To prehydrate, thoroughly mix dry mortar ingredients. Then add just enough water to produce a very stiff, unworkable mix (it should retain its shape only when pressed into a ball). Let stand for about two hours, and then add enough water to bring it to a good, workable consistency. This will be somewhat stiffer than conventional masonry mortars and will be much easier to work into joints.
- Where existing mortar has been removed to a depth greater than 1 in., compact the new mortar in several 1/4-in.-thick layers to reduce overall shrinkage. Allow each layer time to harden before applying the next layer.

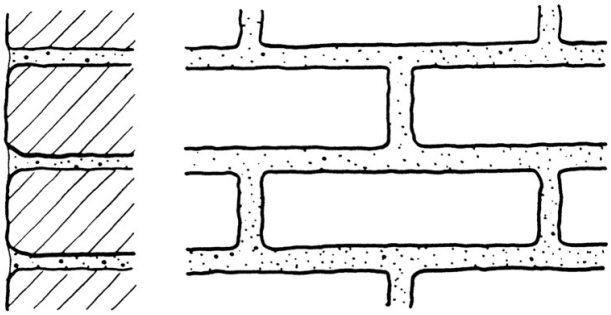
• When the mortar is thumb-print hard, the joint should be tooled to match the existing joint (Tooling Joints, below). Proper timing of the tooling is important. If tooled when the mortar is too soft, the color will be lighter than expected, and hairline cracks may occur. If tooled too hard, there may be dark streaks called "tool burning," and the mortar will not bond tightly to the brick.

FIGURE: LIME VS. CEMENT MORTAR

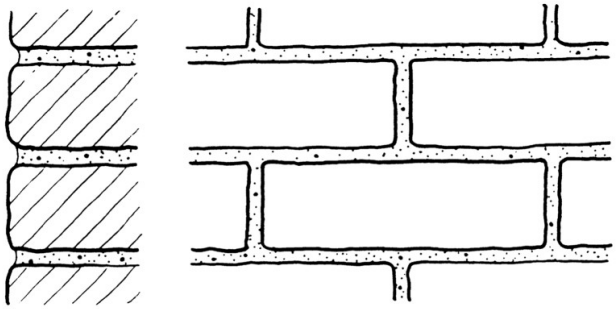


With old brick that is soft, it's important to use a soft lime mortar, which will flex with changes of temperature. If a hard, Portland-cement mortar is used, the brick will spall or joints will open up when the brick moves.

FIGURE: TOOLING JOINTS



Incorrect
Joints are filled too full. Wide feather edge is susceptible to spalling.



Correct
Joints are slightly less recessed, which makes a durable joint.

Do not finish mortar joints flush. The thin edges of the mortar where it meets the weathered brick will be weak and may fail.

Cleanup

If repointing work is done carefully, the only cleaning required after tooling will be a small amount of mortar brushed from the edge of the joint with a stiff bristle brush. This is done after the mortar has dried, but before it is fully hardened (one to two hours). Mortar that has hardened can usually be removed with a wooden paddle or, if necessary, a chisel.

Efflorescence, or "bloom," may appear within the first few months after repointing, but it usually disappears through the normal weathering process. If natural processes do not remove the efflorescence, the safest way to remove it is by dry-brushing with stiff natural- or nylon-bristle brushes and water. Usually, muriatic acid is ineffective and it should be avoided. In fact, it can deposit salts, which can lead to additional efflorescence.