

TECHNICAL ADVISORY NOTE

#202C 2

Basic Guide For Installing Molded Brick

Redland

BRICK

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Molded brick have some important characteristics that may affect bricklaying techniques. The most important of these are:

- strong absorption (Initial Rate of Absorption, "IRA", "Suction")
- lipped edges
- frogs
- sanded finish

First, however, there are important points required for all masonry work, no matter what the type of brick.

Flashing & Weep holes: All brick veneer walls must be designed on the premise that water will enter the wall system. This may occur through the masonry joints (typically at the interface between brick and mortar) or any number of places where cracks, openings, or deteriorated caulking occur. Therefore, all brick veneer walls must incorporate a drainage cavity, flashing where the drainage will be interrupted, and weep holes to direct the drainage back out of the wall. If these elements are not properly designed into the wall system, it is the Mason's responsibility to bring this to the attention of the G.C., Architect, or Owner. (Doing this in writing will help protect the Mason from liability later if leakage problems occur.)

Workmanship: Basic good workmanship techniques can help slow, and reduce the amount of, water that will penetrate through mortar/brick interfaces. This can reduce the frequency and severity of potential water problems, although flashing and weep holes must still be the main line of defense against water penetration to the interior side of the wall.

- (1) Full head joints are especially important, and must include using significant pressure against both brick heads by the mortar in order to get good bonding. Weakly placed and unfilled head joints are notorious for allowing rapid and severe water penetration into walls.
- (2) Moving or adjusting brick units after being placed can destroy the bond with mortar. After only a few seconds, mortar can become dry where it contacts the brick, and movement will create a broken bond, allowing easy access for rain penetration. These paths can be invisible to the eye while being surprisingly open to water.
- (3) The cavity behind the wythe of brick masonry, and the weep holes, must be kept open to allow drainage to occur properly. Blockages by mortar droppings or debris can prevent water from reaching the flashings, which could divert water to the inside of the building. At best, such blocked water may keep wall materials damp for long periods, leading, perhaps, to mildew or deterioration of wall finishes.
- (4) Through wall flashings should be installed so that:
 - a. all flashing joints are sealed, not just lapped,
 - b. the ends of lintel and sill flashings are turned up into dams, and
 - c. the back of the flashing is firmly attached (for block backup, turn into a bed joint; for stud wall, mechanically attached, then covered by the building paper or wrap).

Construction Practices: Poor construction practices can lead to temporary or permanent damage to the appearance of the finished masonry. Good practices required on any brick project include:

- (1) Cover all wall openings which could provide access for precipitation to enter the wall system during construction, including the period of time after masonry is finished but wall openings are not all sealed up. Water which gets into the cavity, or into concrete block cells, will probably cause efflorescence, may lead to permanent staining, and could take years to dry out (that's right, years!).
- (2) Protect the brick masonry from excessive mortar droppings. For example, water tables and sills should be covered with plastic until the masonry work above is completely finished.
- (3) Protect the brick masonry from mortar "splatter" caused by rain falling on mortar-covered scaffold boards.
- (4) Store brick on pallets or boards, off the ground, and away from saws and mixers, which could allow efflorescing dusts to settle onto, and absorb into, the brick. Do not set cubes of brick on concrete, because water will dissolve efflorescing impurities in the concrete, which could be absorbed into the brick.

MOLDED BRICK – UNIQUE PROPERTIES:

MOLDED BRICK; WORKING WITH HIGH IRA'S:

Because sand-mold brick typically have relatively strong IRA's the mortar selection and the mortar application techniques are especially important for obtaining good bond. Even though proper flashing and weep holes should divert penetration water to the outside of the wall, it is important to reduce the frequency and severity of water penetration through the brick veneer. The warmer and drier the weather during laying, the more important these issues and techniques become.

- (1) **Mortar Selection.** Read the Redland Brick "Technical Advisory #95B, Mortar Selection for Molded Brick." Type N mortars are the only mortars recommended by Redland Brick for use with molded brick products. Type N masonry cement mortars can be used when the specifier is experienced with a certain brand. Type N Portland-lime mortar (PCL) field mixed at 1:1:6 proportions only can be used. Never specify mortar by ASTM C270 Property Specification, only by Proportion. Type N mortar-cement is also good with our brick. Type S mortars should never be used with molded brick unless extraordinary circumstances require it.
- (2) **Mortar Spreading Technique.** Strong IRA brick will pull moisture out of fresh mortar more rapidly than low IRA brick. In order to obtain good bonding, mortar must be wet and "plastic" during laying. If mortar is dry and stiff, bonding will suffer. Therefore, the time between spreading mortar and laying the next brick into it should be kept to a minimum. To do this, mortar should be spread for only one or two brick at a time.
- (3) **Filling Head Joints.** The head joints must be filled with enough mortar such that excess will be squeezed out of the top and face of the head joint when the brick is laid. The head joints should be "shoved", not slushed from the top. The shoving technique is proper for all types of brick, but is critical for molded brick. Head joints are the toughest place to get good bonding, so, with high suction and sanded surfaces, molded brick head joints require attention to workmanship.
- (4) **"Wetting Brick".** One method suggested to reduce IRA is to wet brick with clean water. This

satisfies some of the “thirst” so that the brick units will not dry out the mortar as fast. This procedure is extremely difficult to control and may actually cause more problems than it can resolve. Theoretically, wetting can be accomplished in several ways, as long as each brick ends up surface dry when it is laid, while the body of the brick is wet behind the surface. Practically, this is impossible to do this consistently on any project. When done inconsistently, which is almost certain, wide variations in actual IRA values occur, and bonding will be inconsistent. Masons will have difficulty laying these brick. Tooling of the joints will always cause joint color variations under these conditions.

Wetting brick prior to laying is impossible to specify properly. On cool damp days wetting should NOT be done, while on hot dry days it might. Daily testing is not practical, so this becomes a field judgment call. Also, since less water in a wall is better than more water (because of potential efflorescence and staining), wetting should be avoided whenever possible. Type N mortar and good mortar spreading technique (“pick and dip”) will allow masons to obtain good workmanship and bond without wetting the brick.

Because of high IRA's and the methods required to obtain good bond, molded brick are not “high production” brick. Masons must be deliberate in their laying techniques, and speed must be a lower priority. And, “pre-conditioning” (wetting) is NOT recommended.

See Redland's Technical Advisory “IRA, Mortar and Workmanship”.

MOLDED BRICK: LIPS AND FROGS:

The molding process inherently creates a lip along the “struck” bed of each brick. The lip is usually the straightest edge on the brick and can help masons lay to the line if placed up. In addition, the frog in the other bed of the brick helps the mason place the brick into the mortar bed if placed down. Masons must be consistent in placing brick lip-up/bed-down throughout the wall, or the appearance of the masonry will be affected negatively.

MOLDED BRICK: CLEANING NEW MASONRY:

The best method for cleaning new molded brickwork is not cleaning. All of the chemicals used for cleaning will dissolve mortar, and if absorbed into the masonry, will deteriorate the mortar joints to some extent. Avoiding their use can save money as well as preventing potential damage to the wall.

If chemical cleaning is required, follow the Redland Brick Technical Advisory #94A4 “Cleaning Molded Brickwork”. Be certain to get all of the cleaning solution off of the walls as rapidly and completely as possible. We recommend the use of NMD-80 by Eacochem as the best cleaner for our molded brick, as it requires less water and less aggressiveness, helping to reduced the potential for efflorescence and other damages.

INSTALLING MOLDED BRICK ADVISORY 202C - REVIEW OF MAJOR POINTS:

1. Provide complete through-wall flashing and weep holes.
2. Completely fill head joints.
3. Don't move brick after initial placement.
4. Keep cavity and weeps open.
5. Cover all wall tops and openings during construction.
6. Protect masonry from mortar droppings and mortar splatter.
7. Store brick on wood pallets.
8. Prevent saw dust and cement dust from settling on stored brick or new masonry.
9. Use Type N mortar, preferably PCL 1:1:6 proportions.
10. Do not "string out" mortar. Use "pick and dip" method.
11. Do not pre-wet brick.
12. Lay brick lip up, frog down.
13. Follow cleaning instructions carefully. Better yet, don't clean.

If you have any questions, contact Redland Brick Technical Services Department, your Redland Brick Sales Representative or your local Redland Brick Distributor.

REFERENCES:

Redland Brick Technical Advisory:

- #93A Efflorescence in Masonry*
- #94A3 Cleaning Molded Brickwork*
- #95B Mortar Selection for Molded Brick*

Brick Industry Association (BIA) Technical Notes:

- #28 Brick Veneer over Wood Stud Framing*

Masonry Construction Magazine articles (Available from Redland Brick):

- "Flashing Residential Brick Veneer"*
- "Mortar, Brick and IRA"*
- "Detailing Windows to Keep Moisture Out"*
- "Proper Drainage for Weep Holes"*
- "Lime's Role in Mortar"*