

Design Information for Architectural Concrete Masonry Walls

Nature of Product

Architectural Concrete Masonry units are principally used on the exterior of buildings where they are exposed to the elements. They are designed to give structures a façade of lasting beauty.

Architectural Concrete masonry Units (as manufactured by members of the MAF) are made from natural and manufactured aggregate, sand, limestone, gravel, cement and natural and synthetic coloring pigments. These are primarily products of nature varying in size, shape, texture and particle color. Due to the inherent nature of the materials and manufacturing process the specifier shall have a reasonable expectation of:

Some color variation:

Some variations in color, texture and uniformity should be anticipated in the final product. Lighter pastel shades generally exhibit less color variation than do the darker deeper colors. Darker colors seem to accentuate color variations with results appearing more pronounced. Smooth (mold finish) CMU's will exhibit more variations in reflectivity than split-face or other fractured units. Usually the color of the wall built of smooth block will be fairly light and flat appearing. This is due to the rich cement content and the high percentage of fines or laitance which are brought to the surface by the action of vibration during the manufacturing process. This color can be modified by aging and erosion of the surface. The process can be accelerated by sandblasting or by the use of acid or detergent cleaners.

Occasion of efflorescence:

Products of nature have salts that may contribute to efflorescence. Therefore, the occasion of efflorescence might be anticipated. The MAF producers of Architectural Concrete Masonry Units in Florida use specific care to select aggregates and other ingredients that will not contribute to the development of efflorescence. The producers include an integral water repellent in all Architectural Units; however, even with these safeguards there are no guarantees that efflorescence may not develop.

Because Architectural Masonry Units become the exterior façade of the building there are two additional cautions that should be observed. These cautions go beyond the requirements of the concrete masonry units (cmu) that are used for interior construction or those that are to be covered by other materials such as paint, stucco or plaster.

These cautions are:

- Keep walls clean – *Because the finished color of the wall is very important, keeping the wall clean as the work progresses will result in a better project and save cleanup. We strongly advise that cleaning action be of sufficient strength to remove some of the surface laitance so that the fine sands and aggregates will be exposed and contribute to the true aged color of the wall.*
- Waterproofing - *No wall should be considered completely waterproof. There are however, compounds that seal, reduce water penetration, and/or make the wall more water resistant; we refer to them as "waterproofing". Your MAF producer uses an "integral water repellent admixture" in the manufacture of the Architectural Block, which helps water penetration. However, it must be understood that this does not produce a "waterproof" block. Exterior block are subjected to hydrostatic pressure and require special consideration.*

Performance

Architectural Concrete Masonry Units require a high level of performance. To increase this performance, consideration shall be given to:

Mortar:

A type "S" mortar, meeting the requirements of ASTM C 270, is recommended to be used with Architectural Concrete Masonry Units. A colored mortar enhances visual appeal and is recommended when used with colored Architectural Concrete Masonry Units. Coloring material may be added on the jobsite; however, pre-blended mortar colors may produce more uniform results.

Mortar Joints:

Mortar joints in most Concrete Masonry walls represent about 7% to 10% of the wall area. Care must be exercised to achieve a joint that functions properly. It is recommended that a water repellent admixture be added to the mortar at the jobsite. This water repellent admixture should be compatible with the Concrete Masonry Units. Care must also be exercised in the tooling of the joints. A concave joint is considered the desired joint for weather-tightness because it compresses the mortar at the surface. Raked joints of any type should be avoided as they provide a ledge for water to accumulate. A non-staining tool should be used for the tooling of Architectural Concrete Masonry Units.

Product Tolerances:

The tolerances are detailed in the Architectural Concrete Masonry Units Specification.

Chips or Cracks:

Objectionable imperfections should not be evident when viewed at a distance of 60 ft in diffused lighting.

Sample Panel:

A 4ft by 6 ft wide sample panel should be constructed on the jobsite for viewing by the Owner or architect and is required to be a representative of the material and workmanship. These sample panels are very important and should be left intact until the job is completed and accepted by the owner.

Design Details:

MAF has a manual of Architectural Design details that include the flashing of a single-wythe wall and other designs that may be helpful in the detailing of Architectural Concrete Masonry Walls. A copy of the booklet entitled "Architectural Concrete Masonry Construction Details" is available from your local MAF representative or on our website: [http://www.floridamasonry.com/technical/Architectural Concrete Masonry Construction Details.pdf](http://www.floridamasonry.com/technical/Architectural%20Concrete%20Masonry%20Construction%20Details.pdf)

Jobsite Recommendations

The Mason:

It should be noted that the laying of Architectural Block requires much greater attention to detail by the mason.

Stocking the Job:

Adequate space on the jobsite should be provided by the General Contractor for unloading and staging the CMU's. The mason should stock the job blending the units from three or more cubes to take advantage of the subtle tone variation found in the units. CMU's delivered to the jobsite should be single stacked as double stacking causes staining from wood pallets. CMU's may have pallet covers applied on the jobsite as covering units may reduce the amount of dirt and other adulterants that the units might be exposed.

Installing Architectural Block:

The mason should take care not to place into the wall any block inhibiting cracks through the outside face shell in any climatic area subject to wind driven rain.

Cleaning:

The mason should maintain a clean wall. Cleaning shall be done daily. Additionally, the mason should clean the Architectural Block walls with a solution of mild detergent prior to the application of any water repellent sealer.

Surface Applied Sealer:

As with all quality masonry, it is recommended that a sealer be applied to protect the completed wall assembly. This process provides an additional safety feature to your project protecting the wall(s) from the elements. Your concrete masonry manufacturer can recommend specific sealers that have been found to perform in acceptable fashion.

- A. Clear Sealer: Architectural CMU's should have a clear coating of a non-yellowing penetrating sealer, a non-yellowing hydrophobic acryloid base product, or a suitable xylaxane compound applied to protect the completed wall assembly.
- B. Tinted Sealer: A tinted sealer can be used to bring some of the color variations which may be exhibited in the finished wall closer to uniformity. However, the anticipated use of a tinted sealer shall not be used to diminish the overall quality of material or workmanship.

Flashing:

The integral water repellent present in the unit will allow any water making its way through the face shell to run down the inside of the cell without soaking into the block. Advantage should be taken of this feature by flashing the wall and directing this water through weeps to the outside. New products are available which make this simple and affordable.