

Architectural Concrete Masonry Units in Florida

This guideline has been developed by the Masonry Association of Florida (MAF) as a recommended standard for Architectural Concrete Masonry Units in Florida.

1. Scope

1.1 This specification covers hollow and solid Architectural masonry units. There are three classes of Architectural unit – {1} normal weight, {2} medium weight and {3} lightweight.
1.2 Concrete masonry units covered by this specification are made from lightweight or normal weight aggregates or a combination of both.

2. Reference Documents

2.1 ASTM Standards
C33 Specification for Concrete Aggregates
C90 Specification for Load-Bearing CMUs
C150 Specification for Portland
C140 Sampling and Testing Concrete Masonry Units
C270 Specification for Mortar for Unit Masonry
C331 Specification for Lightweight Aggregates for Masonry Units.
E5 14-90 Test Method for Water Penetration and Leakage Through Masonry
C595 Specification for Blended Hydraulic Cements
C618 Specification for Fly Ash and Raw Calcined Natural Pozzolan for use in Admixture in Portland Cement Concrete
C989 Specification for Ground Blast Furnace Slag for use in Portland Cement Concrete

3. Classification

3.1 Types – There is one type of Architectural Concrete Masonry Unit. It is described as exhibiting higher strength, greater density, lower permeability, and greater ability to resist efflorescence than regular concrete masonry units.
3.2 All architectural concrete masonry units covered by this specification will be manufactured to non moisture controlled criteria having possible moisture content at time of use...exceeding 45% of total absorption (average of three units) thereby requiring the use of control joints as shown in Table 1.

**- Table 1 -
Maximum Horizontal Spacing of
Vertical Control Joints**

Wall	Vertical Spacing of Bed Joint Reinforcement (inches)	Maximum Horizontal Spacing (Feet)
Exterior	None	20
	16	26
	8	32
Interior	None	26
	16	32
	8	36

Masonry Association of Florida, Inc. - MAF Tech Note 899
Architectural Concrete Masonry Units in Florida
Per ASTM C-90 Modified for Florida

4. Materials

4.1 Cementitious Materials – Materials shall conform to the following applicable specification:

- 4.1.1 Portland Cement – ASTM C-150
- 4.1.2 Blended Cements – ASTM C-595
- 4.1.3 Pozzolans – ASTM C-618
- 4.1.4 Blast Furnace Slag Cement – ASTM C-989

4.2 Aggregates – Aggregates shall conform to the following specification, except that grading requirements shall not necessarily apply:

- 4.2.1 Normal weight aggregates – ASTM C-33
- 4.2.2 Lightweight Aggregates – ASTM C-331

4.3 Integral Water Repellent Admixture

- 4.3.1 All units shall be manufactured with an integral repellent admixture, applied at the dosage recommended by the admixture manufacturer.
- 4.3.2 The integral water repellent admixture shall be certified, by the admixture manufacturer, with the wall showing no visible water when tested in accordance with E 514-90.

4.4 Other Constituents – Air entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents shall be previously established as suitable for use in concrete masonry and shall conform to applicable ASTM Standards or, shall be shown by test or experience to be not detrimental to the durability of the concrete masonry units or any material customarily used in masonry construction.

5. Physical Requirements

5.1 CMU's – After 28 days from the time of manufacture the units shall conform to the physical requirements prescribed in Table 3.

5.2 All units shall have a minimum age of 7 days prior to delivery to the jobsite.

5.3 Face Shell (FST) and web (WT) thicknesses for hollow units shall conform to the requirements listed in Table 2:

**- Table 2 -
Minimum Thickness of Face Shells and Webs**

Nominal Width (W) of Units Inches	Face Shell Thickness (FST) min. inches	Web ^A minimum Thickness Inches	Equivalent Web ^B Minimum Thickness Inches
4	¾	¾	1 5/8
6	1	1	2 ¼
8	1 ¼	1	2 ¼
10	1 3/8	1 1/8	2 ½
12	1 ½	1 1/8	2 ½

^A Average of measurements on 3 units taken at the thinnest point, when measured as described in C 140. When this Standard is used for split face units, a maximum of 10 percent of a split face shell area may have thickness less than those shown, but not less than ¾ inch.

^B Sum of the measured thickness of all webs in the unit, multiplied by 12 and divided by the length of the unit.

6. Permissible Variations in Dimensions

- 6.1 Overall dimensions for width, height and length of a smooth surface shall not differ by more than ± 1/8" from the specified standard dimension.
- 6.2 Variations in the initiating point of the split surface shall not vary more than ± 1/8"
- 6.3 The theoretical plane established by the split surface shall not vary more than ± 3/4"
- 6.4 The length of CMU's that are fluted or scored shall not vary more than ± 1/16"

7. Finish and Appearance

- 7.1 All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or would significantly impair the strength or permanence of the construction. Minor cracks incidental to the usual method of manufacture, or minor chipping resulting from customary methods of handling in shipment and delivery are not grounds for rejection.
- 7.2 Chips and Cracks – Five percent of a shipment may contain slight cracks or small chips, not larger than 1 inch in any dimension. Units used in exposed wall construction, the face or faces that are to be exposed shall not show objectionable imperfections when viewed from a distance of not less than 60 feet under diffused lighting.

7.3 Color & Texture – the color and texture shall be specified by the purchaser. The finished surfaces that will be exposed shall conform to an approved sample consisting of not less than two units of each color.

7.4 Test Panel – A test panel shall be constructed at the contractor's expense. The panel is to be not less than 4' high by 6' long and shall be viewed for acceptance at a distance of not less than 60 feet under diffused light. The tooling of mortar, general quality, texture, and color of block shall be as required for the project and by the project documents. The consistency of color cannot be reliably assured from test panel viewing as too few block and mortar batches are involved. Block of each size, style or type may be impractical to construct into a test panel.

8. Other Requirements

- 8.1 Acoustical Rating: When special acoustical properties
- 8.2 Admixture: Admixture shall be compatible with CMUs and mortar.
- 8.3 Fire Rating: When a specific fire rating is required it shall be specified by the architect and certificate supplied by the cmu producer. This certification will show the fire rating based on the equivalent thickness and type of aggregate.
- 8.4 Mortar: A type S mortar shall be used.
- 8.5 R-Value: When energy properties of the cmu and/or wall system are specified, the required density of the cmu and insulation material shall be specified by the architect and certificate supplied by the cmu producer.
- 8.6 Strength: When higher strength cmus are required; the strength shall be specified by the architect/engineer and certified by the manufacturer.
- 8.7 Weight: When a specific weight or density is specified the producer of the cmu shall furnish a recent certification complying with the required weight.

9. Sampling & Testing

- 9.1 The purchase or authorized representative shall be accorded proper facilities to inspect and sample the cmus at the place of manufacture from the lots ready for delivery.
- 9.2 Sample and test units, by a CMEC accredited laboratory, in accordance with ASTM Method C-140.

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- Table 3 -

Strength and Absorption Requirements

Compressive Strength min. psi.		Water Absorption max lb/cf {Av 3 units} With oven dry weight of concrete lb/cf		
Average Net Area		Weight Classification		
Average of 3 units	Individual Unit	Lightweight Max. 105lb/cf	Medium Weight 106 – 127 lb/cf	Normal Weight More than 128lb/cf
2800	2500	14	12	10

- a. Higher compressive strengths may be specified when required by design. Consult with local suppliers to determine availability of units of higher compressive strength.
- b. To prevent water penetration, proper detailing, construction, flashing and drainage should be provided.