



Gary Porter, Executive Director of the Masonry Advisory Council is called upon with questions about construction concerns and for masonry advice from a variety of Architects, Engineers, Contractors, Developers and Distributor sources. He is dedicated to ongoing education of masonry and shares helpful tips from his professional experience that may be beneficial to you.

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The Acceptability of Masonry

The Masonry Advisory Council gets several calls each year regarding the acceptability of masonry. An owner or architect thinks that something, about the masonry, does not look right! Was it installed correctly? Is it within the specification? Where are the guidelines for what is acceptable masonry?

The answer for this is found in a combination of several different references.

The first reference is from a group called the American Society of Testing and Materials, better known as ASTM that has worked over many years to develop and publish voluntary consensus technical standards for a wide range of construction materials and products.

When it comes to masonry, and more specifically brick, the specification ASTM C216 – Standard Specification for Facing Brick (Solid Masonry Units made from Clay or Shale), is the recognized standard for brick intended for use in masonry. This is a rather lengthy specification and covers many aspects of brick. It covers the classification of brick, grades of brick, type of brick, ordering information for brick, physical properties of brick, manufacturing of brick, efflorescence, dimensions and permissible variations.

Within the ASTM C-216 spec, there is a section called, Finish and Appearance. There is a table that indicates the limits of chips allowed in the face of a brick. This section then describes that other than chips, the face of brick is to be free of cracks or other imperfections when viewed from 15' for a FBX classified brick or 20' for a FBS or FBA classified brick.

The number of brick in a delivery that are broken or fail to meet the chippage requirements shall not exceed 5%.

After the brick are placed, the manufacturer or its' agent are not responsible for compliance of brick to the chippage or tolerance requirements of this specification.

If brick have a particular color, color range or texture, these must be specified by the purchaser. One end of the majority of brick shall have the same texture or color tone as the approved sample. The texture must match at least 4 brick from an approved sample. The color range shall be indicated by the approved sample.

All these items contribute to the ASTM C-216 spec for Finish and Appearance and this specification has been approved, it is routinely "tweaked" and sets the standard for how brick are to look.

In a similar way when a concrete block or concrete brick are being evaluated for appearance, there are currently seven ASTM specifications that cover various concrete brick and concrete block types. One of these specifications, ASTM C-90, Loadbearing Concrete Masonry Units, has its' own Finish and Appearance section, similar to what ASTM C-216 has for brick. This section talks about permissible cracks and chips when viewed from a distance of 20' under diffused lighting. Color and texture of the units are as specified by the purchaser with a sample of 4 units being representative of the range of color and texture for conformance.

The other reference that contributes to acceptable masonry is the TMS 402/602 Code. This code is loaded with many technical details for the architect, engineer and contractor to be aware of and sets a minimum standard of acceptable construction practices.

The Acceptability of Masonry (cont.)

One of the most important items concerning the appearance of masonry is that a sample panel needs to be prepared on site showing the full range of unit and mortar color. Each procedure that is specified for a wall, cleaning, application of coatings or sealants, should be demonstrated in the sample panel. This sample panel will act as an example of the finished work and is intended to be used to compare the actual work to it. Many times there is no sample built to show everyone involved what is expected. The sample panel should be maintained on the jobsite till all the work is accepted. A section of the completed wall may serve as a sample panel or a separate stand-alone panel as agreed upon.

The other item specified in the TMS 402/602 Code is the site tolerances. Some of these tolerances are established for structural performance and some are for aesthetics. These tolerances are listed below:

SPECIFICATIONS

Site tolerances - Erect masonry within the following tolerances from the specified dimensions.

1. Dimension of elements

- a. In cross section or elevation...
-1/4 in. (6.4 mm), +1/2 in. (12.7 mm)
 - b. Mortar joint thickness ... $\pm 1/8$ in. (3.2 mm)
- bed joint between flashing and masonry... -1/2 in. (12.7 mm), +1/8 in. (3.2 mm)
- head -1/4 in. (6.4 mm), + 3/8 in. (9.5 mm)
- collar..... -1/4 in. (6.4 mm), + 3/8 in. (9.5 mm)
- glass unit masonry see Article 3.3 B.7.c (TMS 402)
- AAC thin bed mortar joint thickness... -0, + 1/8 in. (3.2 mm)
- Grout space or cavity width, except for masonry walls passing framed construction... -1/4 in. (6.4 mm), + 3/8 in. (9.5 mm)

Elements

Variation from level: bed joints

- $\pm 1/4$ in. (6.4 mm) in 10 ft (3.05 m)
 - $\pm 1/2$ in. (12.7 mm) maximum
- top surface of load-bearing walls
- $\pm 1/4$ in. (6.4 mm) in 10 ft (3.05 m)
 - $\pm 1/2$ in. (12.7 mm) maximum

Variation from plumb

- $\pm 1/4$ in. (6.4 mm) in 10 ft 3.05 m)
- $\pm 3/8$ in. (9.5 mm) in 20 ft (6.10 m)
- $\pm 1/2$ in. (12.7 mm) maximum

True to a line

- $\pm 1/4$ in. (6.4 mm) in 10 ft (3.05 m)
- $\pm 3/8$ in. (9.5 mm) in 20 ft (6.10 m)
- $\pm 1/2$ in. (12.7 mm) maximum

Alignment of columns and walls (bottom versus top)

- $\pm 1/2$ in. (12.7 mm) for load-bearing walls and columns...
- $\pm 3/4$ in. (19.1 mm) for non-load-bearing walls

Location of elements

Indicated in plan

- $\pm 1/2$ in. (12.7 mm) in 20 ft (6.10 m)
- $\pm 3/4$ in. (19.1 mm) maximum

Indicated in elevation

- $\pm 1/4$ in. (6.4 mm) in story height
- $\pm 3/4$ in. (19.1 mm) maximum

If the above conditions cannot be met due to previous construction, notify the Architect/ Engineer.

Do you have questions about this or other masonry related topics?

Call MAC at **847-297-6704** for FREE Masonry Advice!

Check out Gary Porter's other masonry tips:

[What's Happening in Masonry >](#)

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