



## ***Boulder Commons***

### **Masonry Contractor**

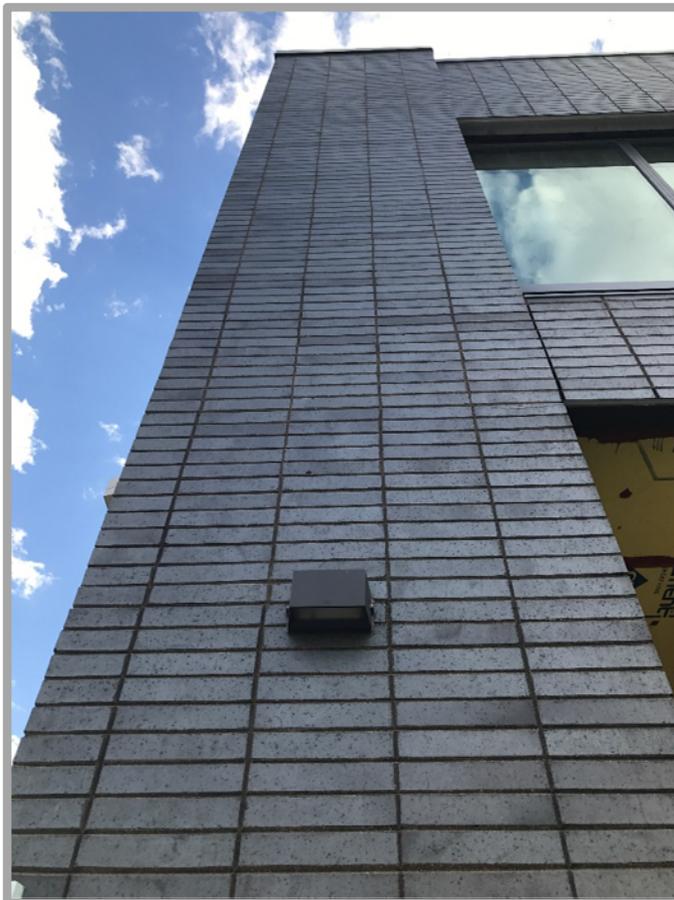
### **Masonry Consultant**

Rocky Mountain Masonry Institute  
Bret Terry, Technical Director  
686 Mariposa Street  
Denver, Colorado 80204

Job Site Visit: September 13, 2017

Report Written: September 26, 2017

The mason contractor requested a site visit by RMMI's technical director to inspect the evaluate their company's recently completed brickwork at the above referenced project. The Project Architect asked for a third-party to evaluate the brick veneer for compliance with masonry industry tolerances for mortar joint variation and the overall alignment of the stacked bond brickwork. The Architect also expressed concerns about the mason contractor using brick from two different production runs because the brick manufacturer accidently released some of the original order to another project.



***Figure 1 shows an example of the material and typical workmanship of the stacked bond brickwork.***

The Masonry Society's (TMS) *Building Code Requirements and Specifications for Masonry Structures (TMS 402/602-13)* is referenced in most Project Specifications and the *International Building Code (IBC)* for the structural considerations of masonry. However, neither the *TMS 402/602* nor the *IBC* address aesthetics of masonry other than the tolerances for out-of-plumb, out-of-level, and out-of-plane. RMMI was not provided with the Project Specifications for Masonry and cannot comment on whether the execution requirements were performed properly.

The specified brick used on this building is Endicott Brick Company's Manganese Ironspot, in a "Norman-size"

***Figure 1***

(actual dimensions are 2-1/4"x 11-5/8"x 3-5/8"). Endicott Brick Company manufacturers only "FBX" (Face Brick Excellent) dimensioned brick.

Meaning the dimensions of the brick used on this project are within 1/16-inch in height, length, and width. This allows for more consistent 3/8-inch wide mortar joints than if the brick was type FBS (Face Brick Standard), which allows the brick dimensions to vary up to 1/8-inch.

The *TMS 602 Specification 3.3 B. Placing mortar and units*, Item 2. *Bed and head joints* states "Unless otherwise required, construct 3/8-in. thick bed and head joints. Item 2.b. states "Unless otherwise required, tool joints with a round jointer when the mortar is thumbprint hard".

Note: The mason contractor's bricklayers maintained 3/8-inch wide mortar joints throughout the brickwork and used a "V-shaped jointer in lieu of the round jointer. All mortar joints appear to be properly sized and tooled.

The *TMS 602 Specification 3.3F. Site tolerances*, Item 1. *Dimensional tolerances* states "Erect masonry within the following tolerances for the specified dimensions.

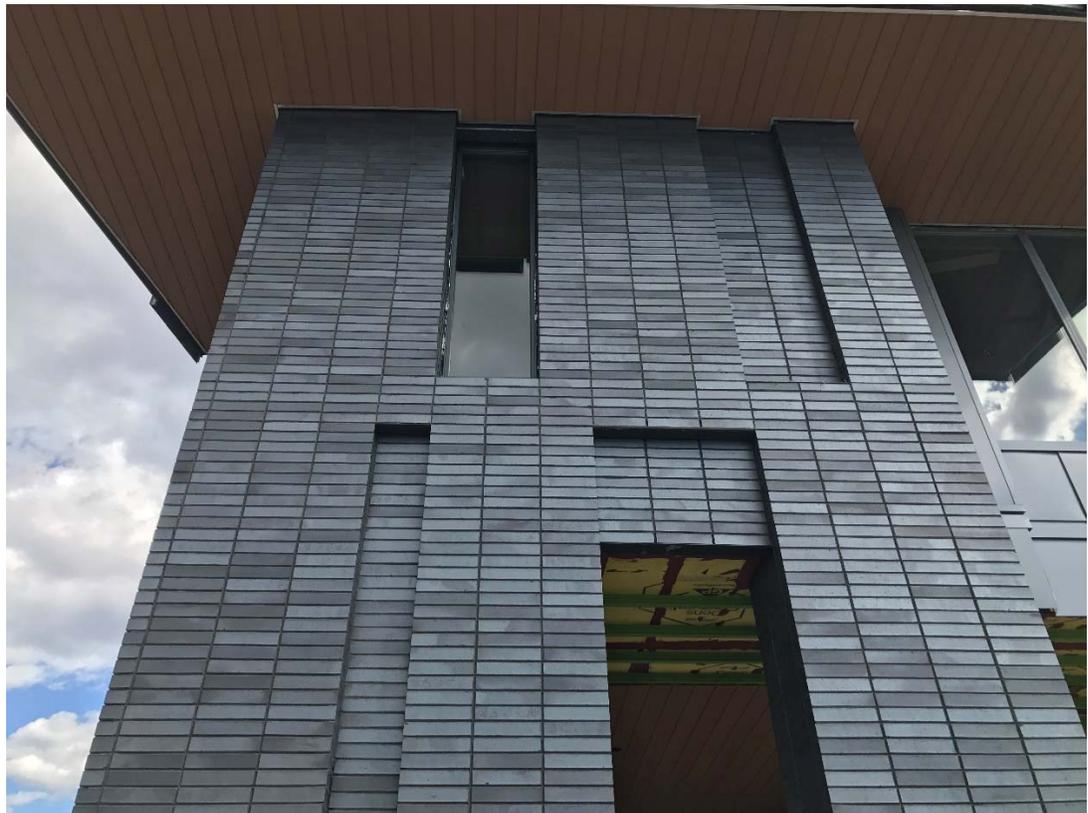
1. Dimensional tolerances

- a. In cross section or elevation, -1/4 in, +1/2 in.
- b. Mortar joint thickness bed joints between masonry courses, +/- 1/8 in.

2. Members

- a. Variation from level, +/- 1/4 in. in 10 ft.
- b. Variation from plumb, +/- 1/4 in. in 10 ft.
- c. True to a line, +/- 1/4 in. in 10 ft.

Note: The mason contractor's bricklayers maintained these tolerances throughout the brickwork.



**Figure 2**

***Figure 2 is an area of the building where two different production runs of Endicott Brick Company's "Manganese Ironspot" brick was used without any apparent color range differences.***

There are slight "squiggles" in the head joints when sighted from below looking straight up the wall and are also detected when standing back from the building at a distance. However, these slight variations are well within industry tolerances and are extremely difficult to avoid in stacked-bond brick patterns, especially when using a dense brick as the kind manufactured by Endicott Brick Company. Endicott brick have a very low initial rate of absorption (IRA) are challenging for most masons to lay because the brick does not absorb much moisture from the mortar and the brick tend to "float" because it takes longer for the mortar to set.

The overall impression of the brickwork on this building is that it was performed in a "craftsmen-like" manner and executed with a high standard for plumb and uniform mortar joints. The final cleaning operations were also executed properly, without using extreme water pressure or aggressive cleaning solutions. The cleaning-technique left the slick joint texture (mortar paste) in place and did not pull the black coloring out of the mortar.

Note: The brickwork executed on the building is superior the mock-up in the lay-down yard. The mason contractor mentioned the mock-up was approved by the Architect.

As mentioned above, the *TMS Specifications* and the *IBC* do not address the aesthetics of brickwork. Most of the tolerances in TMS 602 are for structural walls and are not for masonry veneers. The TMS 402/602 places the onus on the Designer to provide specific tolerances and other workmanship requirements in the Project Specifications or other Contract Documents.

In conclusion, the Endicott brick specified and used on this building is one of the best clay products manufactured in the United States and the workmanship compliments both the brick and the mason contractor.

If you have any questions regarding this report, please do not hesitate to call or email the undersigned.

Sincerely,  
ROCKY MOUNTAIN MASONRY INSTITUTE

Bret M. Terry  
Technical/Executive Director