



# Masonry Technical Bulletin

August 2010

## Tolerances for Masonry Bed Joints.

If the tolerance for the bed joint exceeds one inch, what is the basis for the  $\frac{3}{4}$  inch maximum tolerance? Is there a rationale for this limit? How does it affect the compressive strength of the wall system?

The current 2003IBC standard states: “the thickness of the bed joint of the starting course placed over the foundation shall not be less than  $\frac{1}{4}$  inch and not more than  $\frac{3}{4}$  inch.”



Under the UBC 97 specification, the section for Placing Masonry Units reads: “The initial bed joint thickness shall not be less than  $\frac{1}{4}$  inch or more than 1 inch...” This specification was used in Hawaii for 30 + years.

The rationale for changing this maximum has not been documented but a study made by the Concrete Masonry Association of California and Nevada and the Masonry Institute of America shows that the  $\frac{3}{4}$  inch thickness of the initial bed joint has no significant difference in compressive strength from the 1 inch mortar bed. This led to the State of California to change the maximum allowable bed joint

thickness from  $\frac{3}{4}$  inch to 1  $\frac{1}{4}$  inch maximum.

In reviewing the test, the average compressive strength for the  $\frac{3}{4}$  inch and the 1 inch initial bed joint resulted in the 1 inch being higher than the  $\frac{3}{4}$  inch joint and the 1  $\frac{1}{2}$  inch being about 7% lower than the averages of the  $\frac{3}{4}$  inch joint. (attached is the study by Smith-Emory Laboratory).

For a concrete wall, the maximum allowable variance for the footing is +/-  $\frac{1}{2}$  inch. An overall concrete tolerance difference of 1 inch with a minimum joint thickness makes a 1  $\frac{1}{4}$  inch maximum initial mortar bed joint thickness compatible with concrete.

We hope that this bulletin gives structural engineers some basis of evaluating situations where the bed joints exceed the limit stated in IBC 2003 and IBC 2006.