Detailing brick corbeling

The total horizontal projection shouldn't exceed one-half the thickness of brick veneer or one-half the thickness of a solid masonry wall

By Walter Laska

Architects can enliven buildings with interesting shadows and forms by projecting brick from the wall surfaces. To create corbels that look good and perform well, simply follow the maximum allowable horizontal projections that have been developed empirically (Ref. 1).

For veneer walls, the total horizontal projection should not exceed one-half the thickness of the masonry wythe. For solid masonry walls, the total horizontal projection should not exceed one-

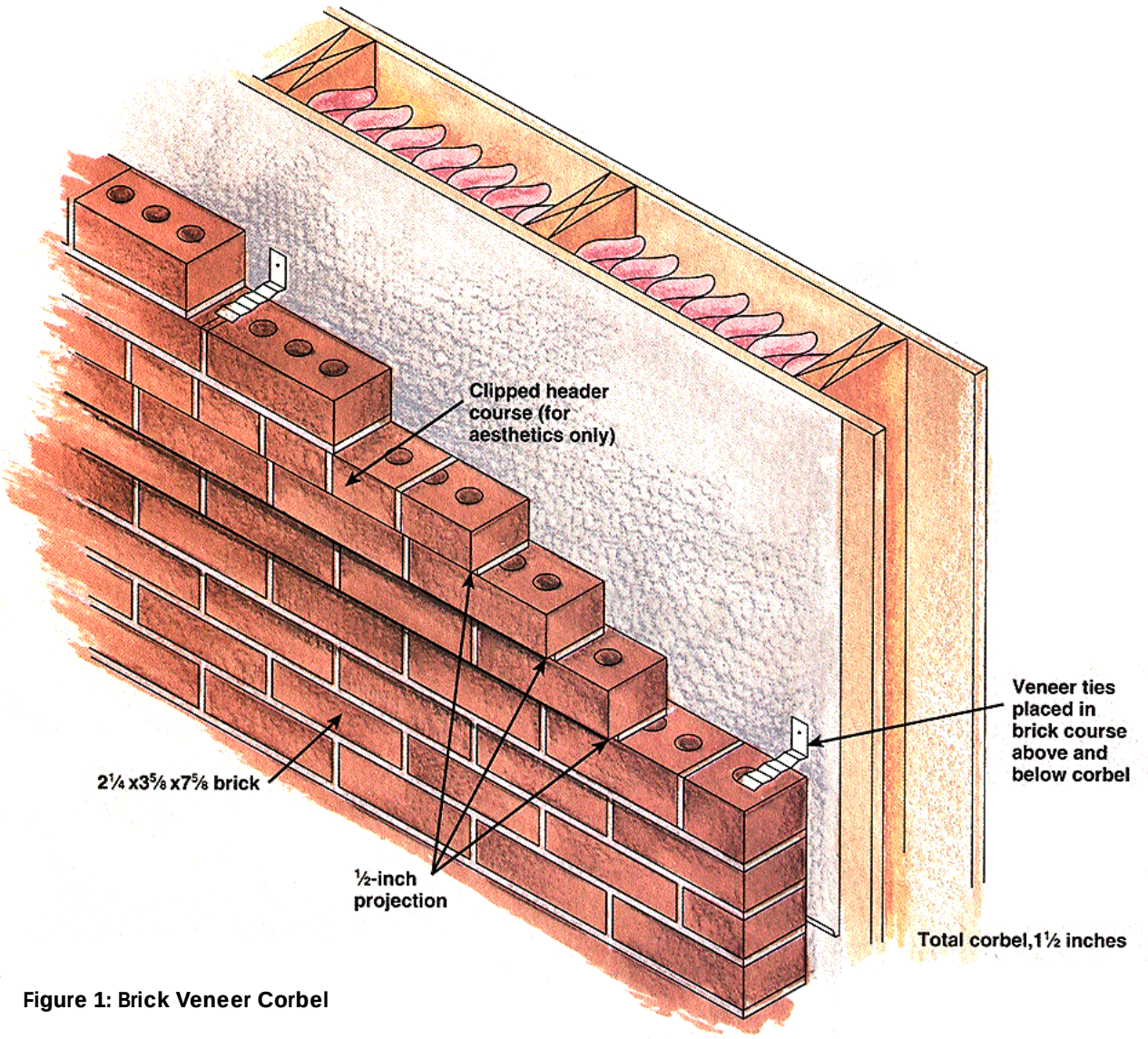

Figure 1: Brick Veneer Corbel

Total allowable corbel = ½ (wythe thickness) = ½ (3⅝ inches) = 1$^{13}/_{16}$ inches

half the actual wall thickness.

Each course of brick also can be corbeled only so much. A single brick course projection should not exceed one-half of the sum of the unit height and mortar joint thickness. In veneer walls, a single brick course projection also shouldn't exceed one-third the nominal unit bed depth. In a solid masonry wall, it also shouldn't exceed one-third of the sum of the unit bed depth and collar joint thickness.

Corbeling brick veneer

Based on the rules given above, for a corbel in a nominal 4-inch brick veneer wall (Figure 1), the total horizontal projection should not be more than 1 13/16 inches. A single course of utility or standard brick shouldn't be projected more than 1 3/16 inches.

Architects also should know the approximate size and location of the brick cores. Unless otherwise specified, ASTM C 216, the standard specification for facing brick, allows cores to be ¾ inch from any edge of the brick. Thus the architect shouldn't let any C 216 cored unit project more than this ¾-inch outer face thickness. Projecting such brick more than ¾ inch would expose the cores, which could be aesthetically displeasing.

The amount an individual brick course is projected also is influenced by the number of brick courses the architect wishes to project. For brick veneer walls, three projections are common. If each projection is about ½ inch, a total corbel of 1½ inches is achieved. This dimension (when considering variations in construction tolerances) falls within the allowable 1 13/16-inch limit. Individual course projections can be made greater than ½ inch, but then only one or two projections can be made. The number of individual courses projected can be increased by decreasing the amount of each projection. However, decreasing the amount each brick course projects may produce a less dramatic corbel.

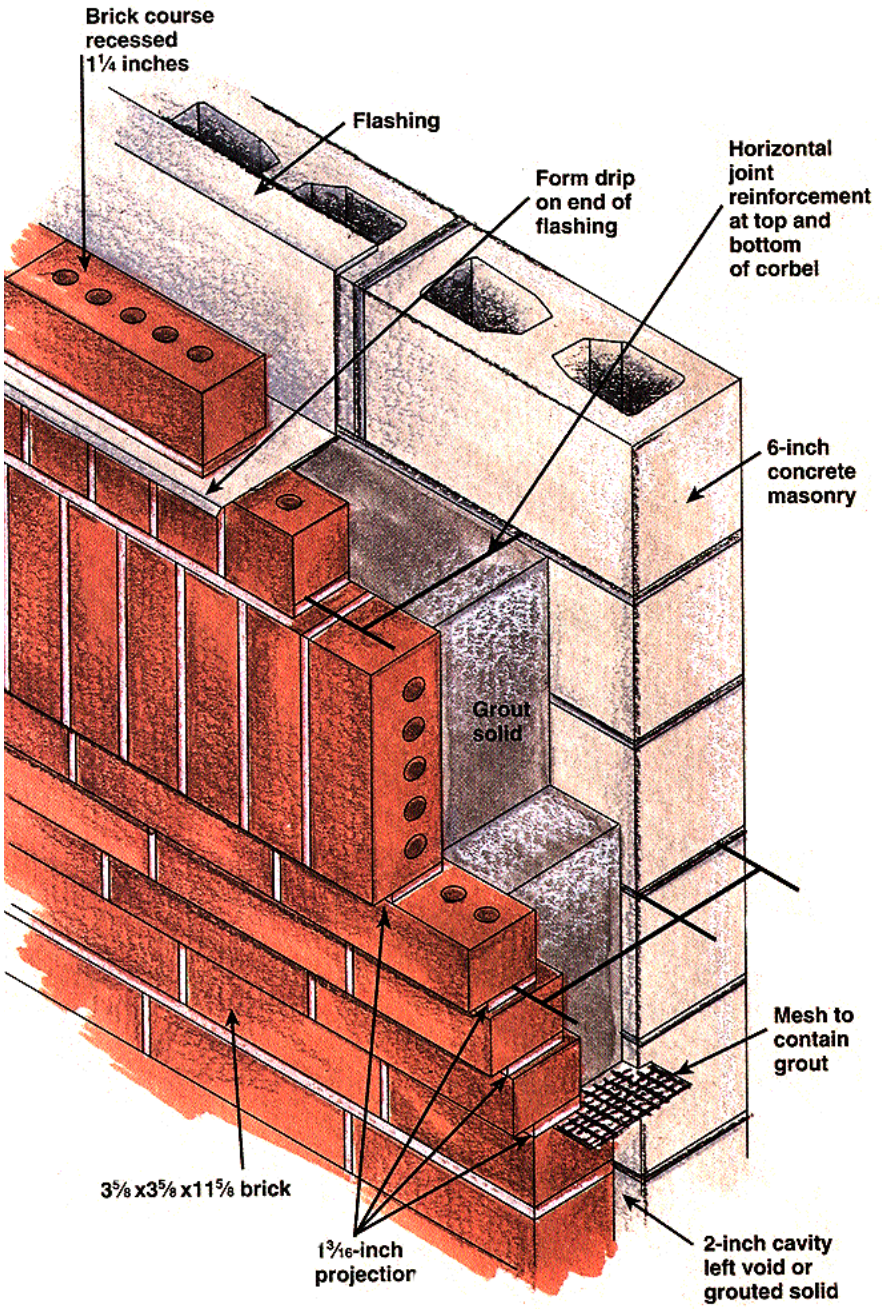

Figure 2: Cavity Wall Corbel

Total allowable corbel = ½ (wall thickness) = ½ (3⅝" + 2" + 5⅝") = 5⅝ inches

Corbeling cavity and solid walls

Using a cavity or solid masonry wall (Figure 2), the architect can create a corbel with an overall projection one-half the wall thickness. This allows for more individual projections, each of which might be greater than what is possible in a brick veneer wall—as long as none exceeds the limits mentioned previously (one-half the nominal unit height or one-third the nominal unit bed depth).

A few additional requirements do exist. The corbeled wall section must be completely solid. In cavity walls, the corbeled section

should be grouted.

Also, the slope of corbeling, measured from the horizontal to the face of the corbeled surface, should be at least 60°. If the corbel slope is less than this, the increased eccentricity will introduce additional stresses into the wall. If that occurs, these stresses should be resisted by reinforcing the wall or taking other precautions.

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Reference

1. "Brick Masonry Details: Caps and Copings, Corbels and Racking," *Technical Notes on Brick Construction,* 36A Revised, Brick Institute of America, 11490 Commerce Park Dr., Reston, VA 22091.

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