Masonry and stone veneer

Because of its vulnerability to damage due to earthquake forces, the prescriptive provisions of the IRC place greater limitations on the height, thickness, and weight of masonry and stone veneers in the higher Seismic Design Categories (SDCs). For buildings sited in SDC "A," "B," or "C," the code generally permits veneers up to three stories and 30 feet above noncombustible foundations, with an additional 8 feet for gable end walls. Maximum thickness is 5 inches and the maximum weight is 50 psf. The code reduces the maximum height, thickness, and weight of veneer for buildings located in SDC "D₀," "D₁," or "D₂." See Figure 7-2 for typical masonry veneer details. [Ref. R703.7]

Support

Masonry veneer typically is supported by a continuous concrete or masonry foundation. In SDC "A," "B," or "C," light-frame construction may support exterior veneer weighing not more than 40 psf when designed to limit deflection to $^{1}/_{600}$ of the span of the supporting members. Steel or noncombustible lintels are required above openings and must have bearing support of at least 4 inches at each end. Steel lintels require a rust-inhibitive shop coat on all surfaces or otherwise be protected against corrosion (Table 7-3, Figure 7-3). [Ref. R703.7.3]

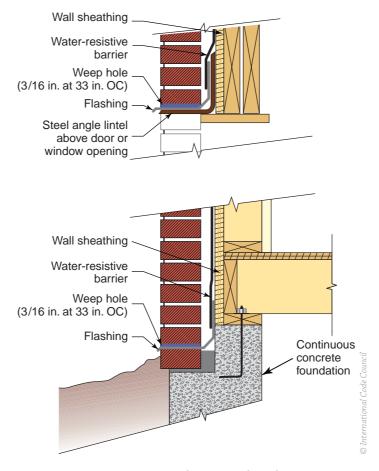


FIGURE 7-2 Brick veneer details

EXAMPLE 7-1

Based on Table 7-3, determine the minimum size of a steel lintel supporting masonry veneer with one story above. The width of the opening is 6 feet 0 inches. The solution is shown in Figure 7-3.

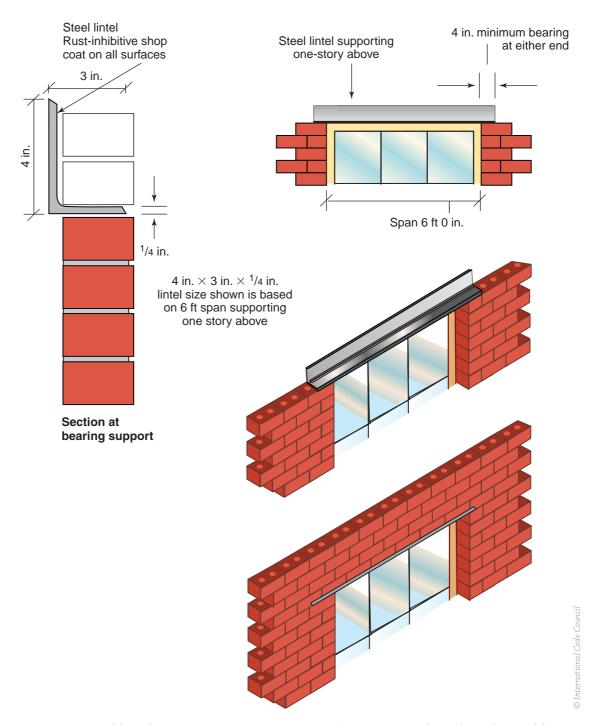


FIGURE 7-3 Steel lintel supporting masonry veneer for one story above based on Table 7-3

TABLE 7-3 Allowable spans for steel lintels supporting masonry veneer

Size of Steel Angle (in.)	No Story Above	One Story Above	Two Stories Above
$3 \times 3 \times \frac{1}{4}$	6'-0"	4'-6"	3'-0"
4 × 3 × ¼	8'-0"	6'-0"	4'-6"
$5 \times 3\% \times \frac{5}{16}$	10'-0"	8'-0"	6'-0"
$6 \times 3\% \times \frac{5}{16}$	14'-0"	9'-6"	7'-0"
$9 - 6 \times 3\% \times \frac{5}{16}$	20'-0"	12'-0"	9'-6"

Note: Long leg of the angle shall be placed in a vertical position.

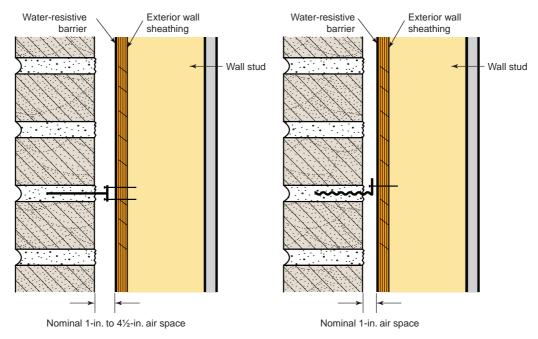
You Should Know

Anchored masonry veneer

- Veneer is not totally impervious to water penetration
- Air space and a waterresistive barrier are needed to keep moisture out of the wall assembly
- Mortar is not permitted to fill the air space
- Air space can be filled with approved grout
- Air space between sheathing and veneer:
 - nominal 1 in. for corrugated ties
 - nominal 1 in. to 4½
 in. for wire ties

Veneer anchoring

Veneer is anchored to the structure with corrosion-resistant metal ties of No. 9-gauge strand wire or No. 22-gauge \times %-inch corrugated sheet metal. The number of anchors is increased for installations in SDCs "D₀," "D₁," and "D₂" and for townhouses in SDC "C" (Figures 7-4 and 7-5). [Ref. R703.7.4]



No. 9 gage wire tie with hook embedded in mortar joint

No. 22 gage x 7/8-in. wide corrugated steel tie

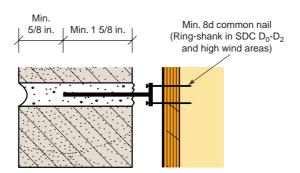


FIGURE 7-4 Brick veneer attachment and air space requirements

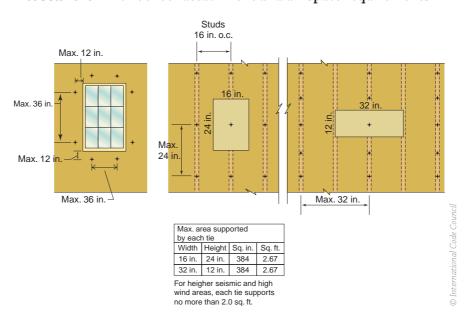


FIGURE 7-5 Veneer tie spacing for all buildings in SDC "A" and "B" and detached dwellings in SDC "C"