Residential Building Code

Masonry, Chimneys and Fireplaces - Areas Frequently Misunderstood

Allegany County Division of Permits and Land Development Services
Residential Information Sheet # 21
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General Masonry

- Masonry walls shall be supported in either the horizontal or vertical direction against lateral forces at intervals as shown in IRC Table R606.8. For bearing walls which are solid, use 20 as the ratio of wall length to thickness when bracing vertically (cross walls, pilasters, buttresses, structural frame members), or wall height to thickness when bracing horizontally (floor, roof). For hollow bearing walls the ratio is 18. **[**For example, a 10" hollow concrete block bearing wall would need vertical *or* horizontal support against lateral forces spaced no further than every 15'(180" length or height divided by 10" thickness = the ratio factor 18). This could be provided with a roof diaphragm at 15', or with a series of pilasters 15' on center along the length of the wall**]**. For non-bearing walls the ratio is 18 for exterior walls and 36 for interior walls.
- All masonry veneer walls require flashing and weepholes in accordance with IRC Section R703.7.5, R703.7.6, and Figure 703.7. Flashing shall be placed beneath the first course of masonry above finish grade above the foundation or slab, and at other points of support such as lintels. Weepholes shall be located immediately above the flashing, shall be at least 3/16" in diameter, and be spaced a maximum of 33" on center.
- The unsupported height of masonry piers shall not exceed ten times their least dimension. When supporting girders or beams, cores shall be filled with concrete or Type M or S mortar, except hollow cores may be used if their unsupported height is not more than four times their least dimension, in which case a 4" solid cap shall be used.

Chimneys

- Masonry chimneys must not support loads other than their weight unless designed to support the additional load
- Footers for masonry chimneys shall be minimum 12 inches thick and have 6 inch projections
- Chimneys shall extend 3 feet above the high point of roof penetration, and at least 2 feet higher than any portion of the roof within 10 feet, measured horizontally
- Chimneys will require crickets when their dimension parallel to the ridge exceeds 30 inches. Clearance to combustibles must be maintained at the cricket. Crickets must be properly flashed and counter-flashed. The height of the cricket is determined by the roof slope (see IRC Table R1001.17)
- Masonry chimneys shall be constructed of minimum 4 inch thick solid masonry outer units; if flue block are used, cores shall be filled with mortar or concrete
- Masonry chimneys shall be lined with fireclay flue liners not less than 5/8 inch thick, or with other approved liners made of material that will resist, without cracking or softening, a temperature of 1800 degrees F.
- Flue liners shall extend at least 8 inches below the lowest inlet to a point above the enclosing masonry wall. Fire clay liners shall be laid with tight mortar joints of medium refractory mortar left smooth on the inside and installed to maintain a half inch air space separating the flue liner from the interior face of the masonry walls. Liners shall be supported on all sides by squeezing out to surrounding walls only enough mortar from the liner joints to stabilize them
- Masonry chimneys completely outside the building wall must have a 1 inch clearance to combustibles (from wall sheathing, from framing passing thru soffit, etc.). Masonry chimneys inside must have a 2 inch clearance to combustibles.
- Where masonry chimneys pass thru floors and ceilings, a non-combustible firestop

must be placed across the clearance air space to prevent passage of fire between floors/attics. Required depth of fireblocking material is 1", supported by metal strips or metal lath laid across the spaces between combustible material and the chimney, and securely fastened. Fire clay mortar is typically used as fireblock.

Fireplaces

- Minimum distance from top of fireplace opening to throat (opening) is 8"
- All fireplaces must have an exterior air supply, which shall not be located within the garage of a dwelling; the air passageway must be minimum 6 sq. inches, but not more than 55 sq. inches, and be covered at the intake with a corrosion-resistant screen
- Masonry fireplaces shall be constructed of solid masonry units, and be 8 inches thick when lined with 2 inches of firebrick, or not less than 10 inches thick when no lining is provided
- Steel fireplace units with a minimum ¼ inch steel firebox liner and an air chamber may be installed with 8 inches of masonry, 4 inches of which must be solid
- Minimum bearing length of the fireplace lintel at ends of opening shall be 4 inches
- Wood or combustible framing shall not be placed within 2 inches of the outside face and sides and not within 4" of the back face of a masonry fireplace;
- There shall be a minimum distance of 36 inches from the back of the firebox to the end of the hearth extension. Hearth extension shall extend at least 16 inches in front of, and 8 inches beyond each side of the fireplace opening. When the fireplace opening is 6 sq. ft. or larger, the hearth extension shall extend at least 20 inches in front of, and 12 inches beyond, each side
- The hearth extension shall be minimum 2" thick concrete or masonry, supported by non-combustible materials, and reinforced to carry its own weight and all imposed loads, except when the bottom of the firebox opening is raised at least 8 inches above the top of the hearth extension, the extension may be not less than 3/8" thick brick, concrete, stone, tile or other approved non-combustible material
- The builder or designer of masonry fireplaces can find, on page 259 of the IRC Code, 2000 Edition, design criteria for required sizes of flue liners based on the fireplace opening area and the height of the proposed flue – see Fig. 1001.12.2