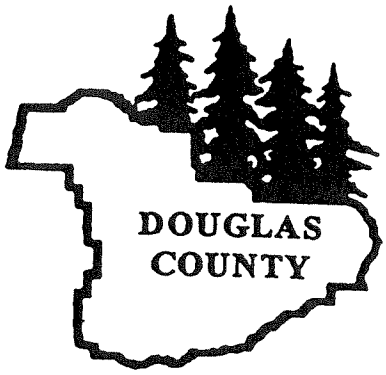

BUILDING DEPARTMENT

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Constructing

CHIMNEYS, FIREPLACES AND BARBECUES

In Compliance With

C.A.B.O.

One and Two Family Dwelling Specialty Code

1995 Edition Effective April 1, 1996

CHAPTER 10
CHIMNEYS AND FIREPLACES

SECTION 1001
MASONRY CHIMNEYS

1001.1 General. Masonry chimneys shall be constructed, anchored, supported and reinforced as required in this chapter and the applicable provisions of Chapters 3, 4 and 6. In Seismic Zones 3 and 4, masonry and concrete chimneys shall be reinforced and anchored as detailed in Section 1003 for chimneys serving fireplaces. In Seismic Zone 0, 1 or 2, reinforcement and seismic anchorage is not required. Chimneys shall be structurally sound, durable, smoke tight and capable of conveying flue gases to the exterior safely.

1001.1.1 Support. Masonry chimneys shall be supported on foundations of solid masonry or concrete at least 12 inches (305 mm) thick and at least 6 inches (153 mm) beyond each side of the exterior dimensions of the chimney. Footings shall be founded on natural undisturbed earth below frostline. In areas not subject to freezing, footings shall be located a minimum of 12 inches (305 mm) below finished grade.

1001.2 Corbeling. Masonry chimneys shall not be corbeled more than 6 inches (153 mm) from a wall or foundation, or a chimney be corbeled from a wall or foundation which is less than 12 inches (305 mm) in thickness unless it projects equally on each side of the wall, except that on the second story of a two-story dwelling, corbeling of chimneys on the exterior of the enclosing walls may equal the wall thickness. The projection of a single course shall not exceed one-half the unit height or one-third of the unit bed depth, whichever is less.

1001.3 Changes in dimension. The chimney wall or chimney flue lining shall not change in size or shape within 6 inches (153 mm) above or below where the chimney passes through floor components, ceiling components or roof components.

1001.4 Additional load. Chimneys shall not support loads other than their own weight unless they are designed and constructed to support the additional load.

1001.5 Termination. Chimneys shall extend at least 2 feet (610 mm) higher than any portion of the building within 10 feet (3048 mm), but shall not be less than 3 feet (914 mm) above the point where the chimney passes through the roof.

1001.6 Wall thickness. Masonry chimney walls shall be constructed of solid masonry units with not less than 4 inches (102 mm) nominal thickness.

1001.7 Flue lining (material). Masonry chimneys shall be lined with fireclay flue liners not less than $^5/_8$ inch (15.9 mm) in thickness or with other approved liner of material that will resist, without cracking or softening, a temperature of 1,800°F. (982°C.).

Exception: Masonry chimneys may be constructed without flue liners when walls are at least 8 inches (203 mm) in thickness of solid masonry.

1001.8 Flue lining (installation). Flue liners shall extend from a point not less than 8 inches (203 mm) below the lowest inlet or, in the case of fireplaces, from the top of the smoke chamber, to a point above the enclosing walls. Fireclay flue liners shall be laid with tight mortar joints left smooth on the inside and installed to maintain a $^1/_2$-inch-wide (12.7 mm) air space separating the flue liners from the interior face of the chimney masonry walls. Flue lining shall be supported on all sides.

1001.9 Multiple flues. When two or more flues are located in the same chimney, masonry wythes shall be built between adjacent flue linings. The masonry wythes shall be at least 4 inches (102 mm) thick and bonded into the walls of the chimney.

Exception: When venting only one appliance, two flues may adjoin each other in the same chimney with only the flue lining separation between them. The joints of the adjacent flue linings shall be staggered at least 7 inches (178 mm).

1001.10 Flue area (appliance). Chimney flues shall not be smaller in area than that of the area of the connector from the appliance. The sizing and installation of a chimney flue to which multiple-appliance venting systems are connected shall be in accordance with Section 2104.3.2.

1001.11 Flue area (masonry fireplace). The cross-sectional area of the chimney flue shall be determined in accordance with Figure 1001.11. For square or rectangular flues, the nominal flue size shown or a size providing equivalent cross-sectional area shall be used. For round flues, the size selected shall be least equal to the effective flue area determined in accordance with Figure 1001.11. The height of the chimney shall be measured from the firebox floor to the top of the last chimney flue tile. Individual flue tiles shall not have a cross-sectional area less than 50 square inches (0.032 m^2) for round flues or 64 square inches (0.041 m^2) for square or rectangular flues. Unlined chimneys shall have a minimum cross-sectional area of 100 square inches (0.064 m^2).

1001.12 Inlet. Inlets to masonry chimneys shall enter from the side. Inlets shall have a thimble of fireclay, rigid refractory material or metal that will prevent the connector from pulling out of the inlet or from extending beyond the wall of the liner.

1001.13 Masonry chimney cleanout openings. Cleanout openings shall be provided within 6 inches (153 mm) of the base of every masonry chimney.

Exception: Chimneys serving masonry fireplaces.

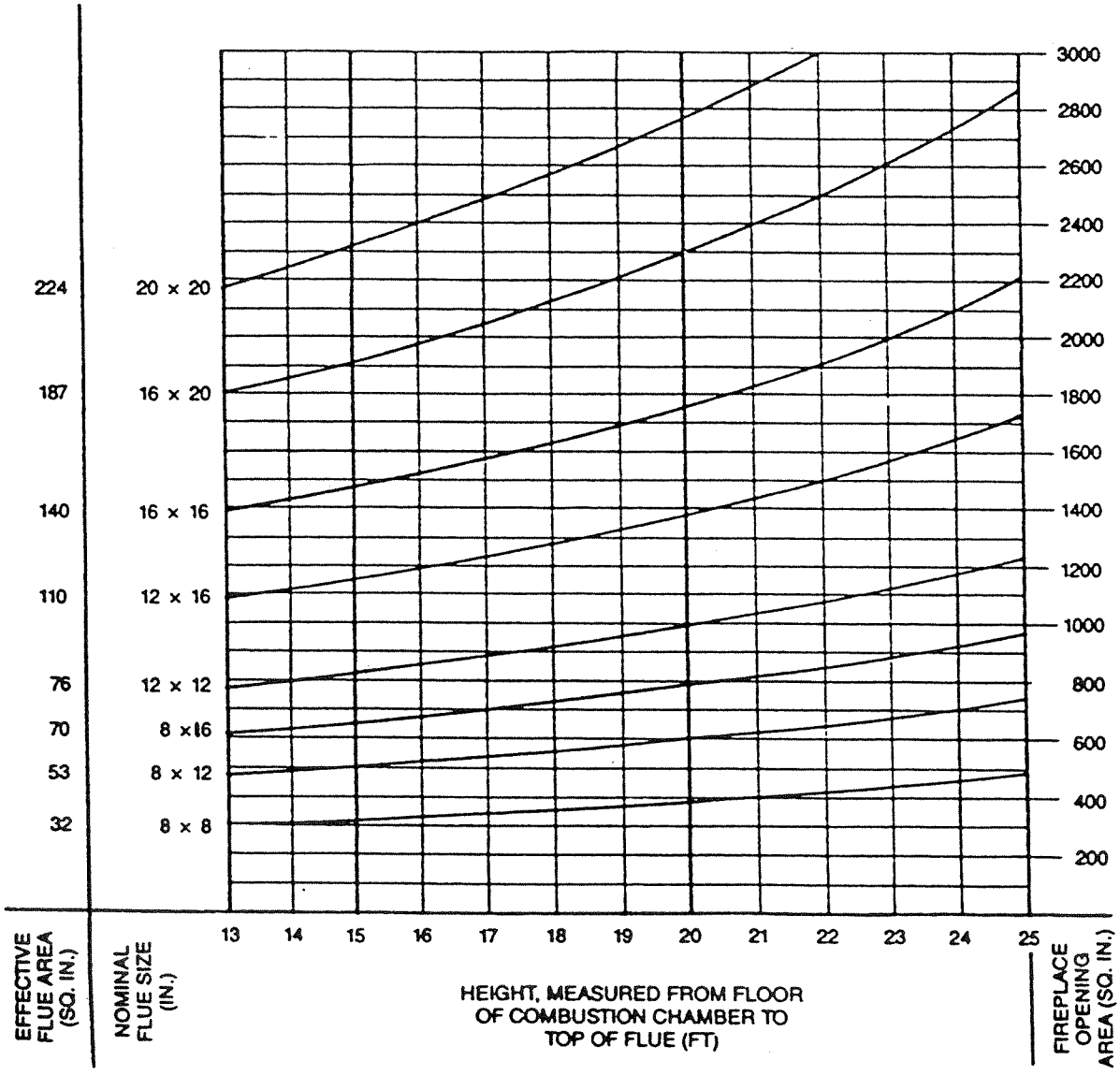
1001.14 Chimney clearances. A portion of a masonry chimney located in the interior of the building or within the exterior wall of the building shall have a minimum air space clearance to combustibles of 2 inches (51 mm). Chimneys located entirely outside the exterior walls of the building, including chimneys that pass through the soffit or cornice, shall have a minimum air space clearance of 1 inch (25 mm). The air space shall not be filled, except to provide firestopping in accordance with Section 1001.15.

Exception: Masonry chimneys equipped with a chimney lining system listed and labeled for use in chimneys in contact with combustibles in accordance with UL 1777, and installed in accordance with the manufacturer's installation instructions, are permitted to have combustible material in contact with their exterior surfaces. However, this shall not eliminate the requirement for noncombustible firestopping in accordance with Section 1001.15.

1001.15 Chimney firestopping. See Section 602.7.

1001.16 Chimney crickets. Chimney shall be provided with crickets when the dimension parallel to the ridgeline is greater than 30 inches (762 mm) and does not intersect the ridgeline. The intersection of the cricket and the chimney shall be flashed and counterflashed in the same manner as normal roof-chimney intersections. Crickets shall be constructed in conformity with Figure 1001.16 and Table 1001.16.

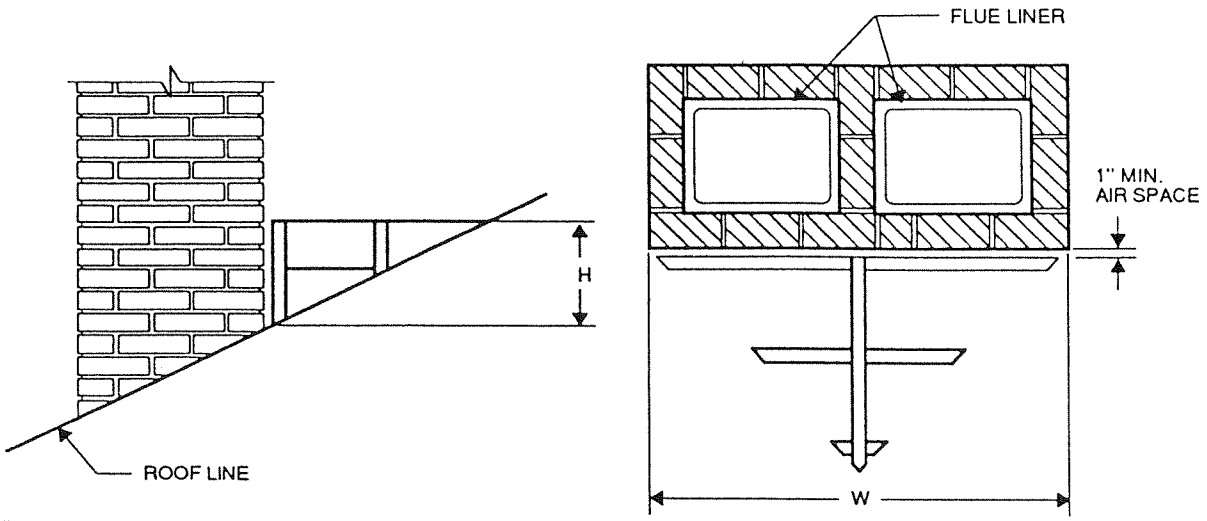
Pursuant to ORS 215.730, if a single-family dwelling located on lands zoned forest land has a chimney or chimneys, each chimney shall have a spark arrester.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square inch = 645.16 mm^2.

[1] When using Figure 1001.11, select the smaller flue size when the opening and height selected for the fireplace and chimney, respectively, intersect between standard flue sizes.

FIGURE 1001.11
FLUE SIZES FOR MASONRY CHIMNEYS[1]



For SI: 1 inch = 25.4 mm.

FIGURE 1001.16
CHIMNEY CRICKET

TABLE 1001.16
CRICKET DIMENSIONS

ROOF SLOPE	H
12 - 12	1/2 of W
8 - 12	1/3 of W
6 - 12	1/4 of W
4 - 12	1/6 of W
3 - 12	1/8 of W

SECTION 1002
FACTORY-BUILT CHIMNEYS

1002.1 General. Factory-built chimneys shall conform to the conditions of their listing and the manufacturer's instructions. Factory-built chimneys that are listed as part of an assembly with factory-built fireplaces shall conform to Section 1004.1.

SECTION 1003
MASONRY FIREPLACES

1003.1 Fireplace support. Fireplace foundations and supporting walls shall be anchored, supported and reinforced as required in Sections 1003.1 through 1003.12, Table 1003.1, Figure 1003.1, and the applicable provisions of Chapters 3 and 4. Foundations for masonry fireplaces and their chimneys shall be constructed of concrete or solid masonry at least 12 inches (305 mm) thick and extend at least 6 inches (153 mm) beyond the face of the fireplace or supporting wall on all sides. Footings shall be founded on natural undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be at least 12 inches (305 mm) below finished grade.

1003.2 Seismic reinforcing. Masonry or concrete chimneys in Seismic Zones 3 and 4 shall be reinforced. Reinforcing shall conform to the requirements set forth in Table 1003.1. When the width of the chimney exceeds 40 inches (1016 mm), two additional No. 4 vertical bars shall be provided for each additional flue incorporated in the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

1003.3 Seismic anchorage. In Seismic Zones 3 and 4, masonry and concrete chimneys shall be anchored at each floor ceiling or roof line more than 6 feet (1829 mm) above grade, except when constructed completely within the exterior walls. Anchorage shall conform to the requirements set forth in Table 1003.1.

1003.4 Fireplace walls. Masonry fireplaces shall be constructed of solid masonry units, stone or reinforced concrete in accordance with Figure 1003.1. When a lining of firebrick at least 2 inches (51 mm) in thickness is provided, the total thickness of back and sides, including the lining, shall not be less than 8 inches (203 mm). When no lining is provided, the thickness of back and sides shall not be less than 10 inches (254 mm).

1003.5 Steel fireplace units. Steel fireplace units incorporating a firebox liner of not less than 1/4 inch (6.4 mm) in thickness and an air chamber may be installed with masonry to provide a total thickness at the back and sides of not less than 8 inches (203 mm), of which not less than 4 inches (102 mm) shall be of solid masonry. Warm-air ducts employed with steel fireplace units of the circulating air type shall be constructed of metal or masonry.

1003.6 Lintel. Masonry over a fireplace opening shall be supported by a lintel of noncombustible material. The minimum required bearing length on each end of the fireplace opening shall be 4 inches (102 mm).

1003.7 Hearth extension material. Hearth extensions shall be of masonry or concrete at least 2 inches (51 mm) thick and supported by noncombustible materials and reinforced to carry its own weight and all imposed loads. The hearth extension shall be readily distinguishable from the surrounding floor. Combustible forms and centers used during the construction of the hearth extension shall be removed after the construction is complete.

Exception: When the bottom of the firebox opening is raised at least 8 inches (203 mm) above the top of the hearth extension, a hearth extension of not less than 3/8-inch-thick (9.5

mm) brick, concrete, stone, tile or other approved noncombustible material may be used.

1003.8 Hearth extension. The hearth and the hearth extension shall extend a minimum of 36 inches (914 mm) from the back of the firebox to the end of the hearth extension. Hearth extensions shall extend at least 16 inches (406 mm) in front of, and at least 8 inches (203 mm) beyond, each side of the fireplace opening. Where the fireplace opening is 6 square feet (0.557 m^2) or larger, the hearth extension shall extend at least 20 inches (508 mm) in front of, and at least 12 inches (305 mm) beyond, each side of the fireplace opening.

1003.9 Fireplace clearance. Wood or combustible framing shall not be placed within 2 inches (51 mm) of the outside face of a masonry fireplace and not less than 6 inches (153 mm) from the inside surface of the nearest flue lining. Wood framing and other combustible material shall not be placed within 2 inches (51 mm) of the back surface of a masonry fireplace.

1003.10 Fireplace firestopping. See Section 602.7.

1003.11 Combustible materials. Woodwork or other combustible materials shall not be placed within 6 inches (153 mm) of a fireplace opening. Combustible material within 12 inches (305 mm) of the fireplace opening shall not project more than $^1/_8$ inch (3.2 mm) for each 1-inch (25 mm) distance from such opening.

1003.12 Ash dump cleanout. Cleanout openings, when provided, shall be equipped with ferrous metal doors and frames constructed to remain tightly closed, except when in use. Cleanouts shall be accessible and located so that ash removal will not create a hazard to combustible materials.

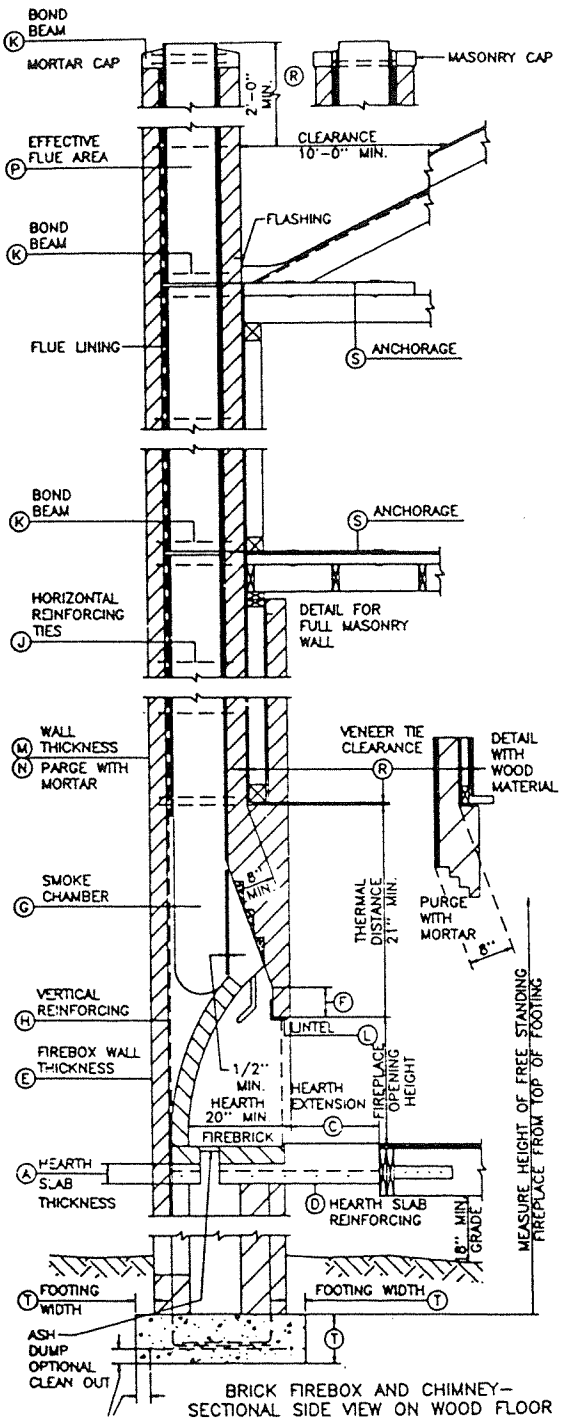
TABLE 1003.1
REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS

ITEM	LETTER[1]	REQUIREMENTS
Hearth slab thickness	A	4″
Hearth extension (each side of opening)	B	8″ fireplace opening < 6 sq. ft. 12″ fireplace opening ≥ 6 sq. ft
Hearth extension (front of opening)	C	16″ fireplace opening < 6 sq ft. 20″ fireplace opening ≥ 6 sq. ft.
Hearth slab reinforcing	D	Reinforced to carry its own weight and all imposed loads.
Thickness of wall of firebox	E	10″ solid brick or 8″ where a firebrick lining is used. Joints in firebrick $^1/_4$″ max.
Distance from top of opening to throat	F	8″
Smoke chamber edge of shelf Rear wall—thickness Front and sidewall—thickness	G	 6″ 8″
Chimney Vertical Reinforcing[2]	H	Four No. 4 full-length bars for chimney up to 40″ wide. Add two No. 4 bars for each additional 40″ or fraction of width or each additional flue.
Horizontal reinforcing[2]	J	$^1/_4$″ ties at 18″ and two ties at each bend in vertical steel.
Bond beams	K	No specified requirements.
Fireplace lintel	L	Noncombustible material.
Walls with flue lining	M	Brick with grout around lining or $^1/_2$″ airspace 4″ min. from flue lining to outside face of chimney.
Walls with unlined flue	N	8″ solid masonry.
Distances between adjacent flues	—	See Section 1001.9
Effective flue area (based on area of fireplace opening)	P	See Section 1001.11
Clearances Wood frame Combustible material Above roof	R	 See Sections 1001.14 and 1003.9 See Section 1003.11 2′ at 10′
Anchorage[2] Strap Number Embedment into chimney Fasten to Bolts	S	 $^3/_{16}$″ × 1″ 2 12″ hooked around outer bar w/6″ ext. 4 joists Two $^1/_2$″ diameter.
Footing Thickness Width	T	 12″ min. 6″ each side of fireplace wall.

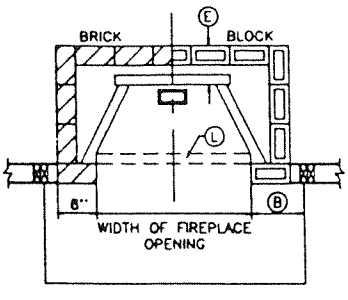
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

[1] The letters refer to Figure 1003.1.

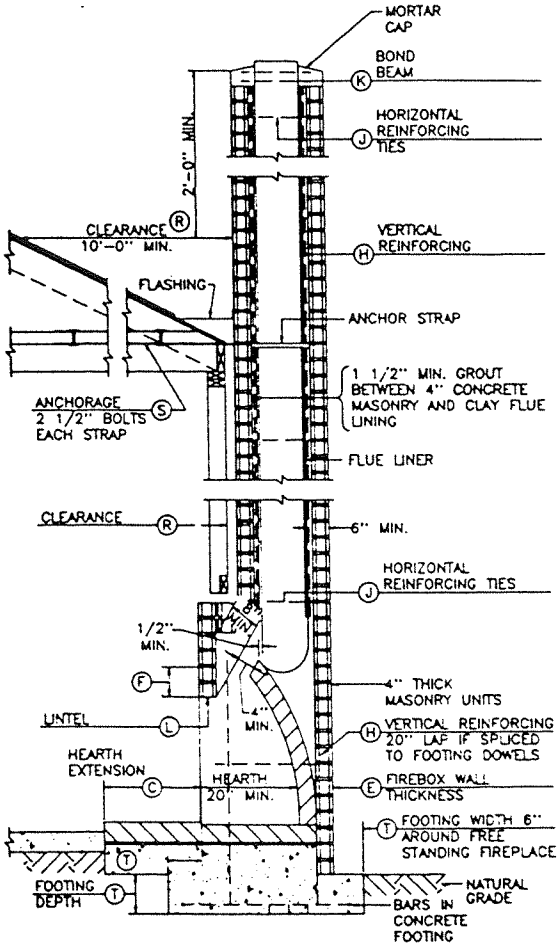
[2] Not required in Seismic Zone 0, 1 or 2.



BRICK FIREBOX AND CHIMNEY—
SECTIONAL SIDE VIEW ON WOOD FLOOR



PLAN VIEW



BRICK FIREBOX AND BLOCK CHIMNEY—
SECTIONAL SIDE VIEW ON CONCRETE SLAB

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE 1003.1
FIREPLACE AND CHIMNEY DETAILS

SECTION 1004
FACTORY-BUILT FIREPLACES

1004.1 Installation. Factory-built fireplaces that consist of a fire chamber assembly, one or more chimney sections, a roof assembly and other parts as tested and listed as an assembly by an approved agency may be installed when complying with all the following provisions:

1. The fire chamber assembly is installed to provide clearance to combustible materials not less than set forth in the listing.
2. The chimney sections are installed to provide clearance to combustible material not less than specified in the listing and if the fireplace chimney extends through floors and ceilings, factory-furnished firestops or firestop spacers shall be installed. Portions of chimneys which extend through rooms or closets are to be enclosed to avoid personal contact, contact of combustible material, and damage to the chimney.
3. Hearth extensions shall not be less than $^3/_8$-inch-thick (9.5 mm) asbestos, hollow metal, stone, tile or other approved noncombustible material. Such hearth extensions may be placed on combustible subflooring or finish flooring. The hearth extension shall be readily distinguished from the surrounding floor.
4. Hearth extensions shall extend not less than 16 inches (406 mm) in front of and at least 8 inches (203 mm) beyond both sides of the fireplace opening.

5. Factory-built fireplaces shall be installed in accordance with their listing and the manufacturer's installation instructions.
6. The supporting structure for a hearth extension shall be at the same level as the supporting structure for the fireplace unit unless otherwise authorized by the listing.

SECTION 1005
FACTORY-BUILT FIREPLACE STOVES

1005.1 General. Factory-built fireplace stoves, consisting of a freestanding fire chamber assembly, that have been tested and are listed by a nationally recognized testing laboratory, shall be installed in accordance with the requirements of said listing and the manufacturer's instructions. The supporting structure for a hearth extension shall be at the same level as the supporting structure for the fireplace unit.

SECTION 1006
EXTERIOR AIR SUPPLY

1006.1 Exterior air. All solid fuel-burning masonry fireplaces covered in this chapter shall be equipped with an exterior air supply to ensure proper fuel combustion.

1006.2 Exterior air intake. The exterior air intake shall be capable of providing all combustion air from the exterior of the dwelling or from spaces within the dwelling ventilated with outside air, such as crawl or attic space. The exterior air intake shall not be located within the garage of the dwelling. The exterior air intake shall be covered with a corrosion-resistant screen of $^1/_4$-inch (6.4 mm) mesh.

1006.3 Passageway. The combustion air passageway shall be a minimum of 6 square inches (3870 mm^2) and not more than 55 square inches (0.035 m^2).

1006.4 Inlet. The exterior air inlet is permitted to be located in the sides of the firebox chamber, or within 24 inches (610 mm) of the firebox opening on or near the floor. The inlet shall be closable and designed to prevent burning material from dropping into concealed combustible spaces.

DOUGLAS COUNTY IS LOCATED IN SEISMIC ZONE 3
Requirements: No. 4 (1/2") reinforcement at each corner minimum. Horizontal Reinforcement 1/4" ties at 18" and two ties at each bend in vertical steel.