d All partition walls (or sections of these walls) in which heat stacks to second floor rooms are to be installed, shall be built of six-inch (6″) studding to second story floor joists.

Chimneys

Section 2. *a* The owner shall provide a chimney for the furnace constructed in a manner to comply with the following specifications.

b The chimney must be absolutely smoke tight throughout its entire length, and must extend at least three feet (3′) above a flat roof or two feet above the ridges of peak roofs.

c If built of a single thickness of brick or of cement blocks, it shall be lined throughout its entire length with fire-clay flue lining, having not less than three-fourths inch (¾″) thickness. Flue lining to be laid in mortar and made air tight.

d The furnace flue must have no other opening for attaching any fireplace, furnace, stove, range, water heater, gas or ventilating connection.

e If necessary to offset the flue, it must be done in such a manner as not to reduce the cross sectional area nor create a ledge or obstruction, where loose material may lodge.

f Its narrowest internal dimension shall not be less than eight (8″) inches and no flue smaller than 8″ x 8″ rectangular or eight (8″) inch diameter round will be considered suitable when hard coal is to be burned, or 8″ x 12″ rectangular or ten (10″) inch round for soft coal or wood.

g It is strongly recommended that nothing less than 8″ x 12″ internal dimensions be used in any case.

Note 2.—It is recommended that the height above the furnace grate be not less than twenty-six (26′) feet.

Note 3.—It is strongly recommended that all new chimneys be built in strict accordance with the ordinance recommended by the National Board of Fire Underwriters.

ARTICLE 3.—Method for Determining Size of Warm Air Pipes, Wall Stacks and Furnaces for Use in a Residence

Method of Determining Size of Basement Warm Air Pipes

(Read Explanatory Notes 4 to 11

Section 1. First Floor Rooms.

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60,
Divide cubic contents by 800,
Add together the above and multiply by 9.
The result is the area of the basement pipe.

$$\left\{\begin{array}{l}\text{The sum of:}\\ \text{Glass (sq. ft.) } (\textit{Note 4}) \div 12\\ \text{Net Wall (sq. ft.) } (\textit{Note 5}) \div 60\\ \text{Cubic Contents} \div 800\end{array}\right\} \times 9 = \text{Area of Basement Pipe } (\textit{Note 10})$$

Section 2. Second Floor Rooms.

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60,
Divide cubic contents by 800,
Add together the above and multiply by 6.
The result is the area of the basement pipe.

$$\left\{\begin{array}{l}\text{The sum of:}\\ \text{Glass (sq. ft.) } (\textit{Note 4}) \div 12\\ \text{Net Wall (sq. ft.) } (\textit{Note 5}) \div 60\\ \text{Cubic Contents} \div 800\end{array}\right\} \times 6 = \text{Area of Basement Pipe } (\textit{Note 10})$$

Section 3. Third Floor Rooms.

Divide square feet of glass by 12,
Divide square feet of net outside wall by 60,
Divide cubic contents by 800,
Add together the above and multiply by 5.
The result is the area of the basement pipe.

$$\left\{\begin{array}{l}\text{The sum of:}\\ \text{Glass (sq. ft.) } (\textit{Note 4}) \div 12\\ \text{Net Wall (sq. ft.) } (\textit{Note 5}) \div 60\\ \text{Cubic Contents} \div 800\end{array}\right\} \times 5 = \text{Area of Basement Pipe } (\textit{Note 10})$$

Method of Determining Size of Wall Stacks

Section 4. First Floor Rooms.

Same as Section 1.

Section 5. Second Floor Rooms.

Deduct 30 per cent from basement pipe area determined in Section 2.

Section 6. Third Floor Rooms.

Deduct 30 per cent from basement pipe area determined in Section 3.

Explanatory Notes

Note 4.—In obtaining glass surface use full casement opening. An outside door is figured as glass.

Note 5.—To obtain net outside wall multiply height by width and deduct the glass in all windows and outside doors.

Note 6.—For rooms having unusual exposure, ordinarily north, northeast and northwest, add 15 per cent to pipe area. For east and west exposure, add 10 per cent.

Note 7.—For cold ceilings, add one-half net area of ceiling to net exposed wall (cold ceilings are those next to unfloored attics.)

Note 8.—Use no warm air pipe less than 8 inches in diameter. If a basement warm air pipe figures greater area than any standard commercial size then the next larger size shall be used.

Note 9.—It is understood in using the above values for determining basement warm air pipe areas, that these pipes should be run comparatively straight and that they should not be over 10 to 12 feet in length. Sharp turns and long pipes should have extra capacity.

Note 10.—These formulae are for 70 deg. inside temperature with zero temperature outside. For a temperature of 10 deg. below zero, add 10 per cent to the capacity of each pipe.

Note 11.—The value of 800 (used in cubic contents) is for an estimated air change of one room volume per hour. If it is desired to provide for 1½ room volume use the figure 600. If for 2-room volumes use the figure 400. "The factors 9, 6 and 5 in sections 1, 2 and 3 are calculated for a register air temperature of 175 deg."

Transition Fittings and Stacks

Section 7. Transition from warm air pipes to stacks shall be made with a well-designed elbow or boot and no stack shall be less than 70 per cent of the warm air pipe area.

Method of Determining Size of Registers

Section 8. All registers shall have a free area at least equal to the calculated area of the basement pipe.

Method of Determining Size of Furnace

Section 9. Add together the actual warm air pipe areas in square inches as obtained in Sections 1, 2 and 3, and select a furnace having a free area not less than the sum of all the warm air pipe areas.

ARTICLE 4.—Installation—Location of Furnace

Section 1. The location of the furnace shall equalize the length of warm air runs as far as possible, yet give necessary preference to pipes supplying living rooms, dining rooms and main halls.

Foundation

Section 2. Furnace foundation of brick, cement, or other incombustible material must be provided. Said foundation to extend at least fifteen (15″) inches at rear and sides of furnace casing and at least thirty-six (36″) inches in front of furnace casing. Foundation to be level.

Setting or Assembling of Furnace

Section 3. *a* The base ring of the furnace shall be cemented to the foundation, making an air tight joint. The furnace parts shall be assembled plumb and level, and in a workmanlike manner.

b All sections and joints shall be properly fitted. Joints requiring cement shall be well filled and all bolts shall be drawn up tightly.

Casings

Section 4. *a* Warm air furnaces shall be enclosed in metal casings or walls of brick, tile or concrete.