4. FILLING OF HOLLOW BUILDING TILE

When chimney walls are built of hollow tile as provided in Section 1, Par 10, it is recommended that the inner course of cells next to the flue lining be filled with mortar.

5. WITHES.

A withe between at least every second and third flue in a chimney space is strictly necessary to insure stability of the chimney. A withe also aids in securing uniform temperature in a flue, and prevents air leakage, thus promoting good draft and fuel economy. At the same time it prevents possibility of a fire in one flue communicating to the others. For these reasons every flue connected with a fireplace or heating furnace of any type is required to be separated from other flues by such withes. The ideal chimney would have all flues separated by withes. See Plate IV.

6. AREA AND HEIGHTS OF CHIMNEYS

To secure the most satisfactory draft conditions, the area and height of a chimney should be proportional to the size and character of heating appliance attached to it. A poor draft is a great annoyance, and is difficult to remedy after a chimney is built.

A round flue will give a better draft than a square or other rectangular shape having the same cross-sectional area. Round flues are recommended where it is practical to obtain them, but when round flue linings are placed inside rectangular chimney walls, care must be exercised to insure complete filling of the corner spaces, otherwise there is liable to be air leakage into the vacant spaces, which injures the draft and increases the fire hazard.

Table 1 gives the approximate area and height of chimneys recommended by the furnace and boiler manufacturers associations as suitable to produce proper draft for heating equipment of different kinds and varying sizes when coal or coke is the fuel used.

The *American Institute of Architects* and the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS have withheld approval of this table on the ground that it is not yet a sufficiently recognized standard to warrant its being accepted as a satisfactory guide in all cases. The other endorsers of the ordinance have not expressed an opinion on this matter.

7. SUGGESTIONS FOR REPAIR OF OLD UNLINED CHIMNEYS

1. A chimney in any existing building that becomes too hot to hold the hand against comfortably is dangerous if there is woodwork touching it. Have it carefully inspected by a reliable mason, and apply the protection prescribed by this ordinance as far as is possible.

2. The smoke test as described in Section 1, Par. 26, is strongly recommended as the best method for discovering defects in chimney walls which always indicate danger. If smoke escapes through the chimney walls at any place the chimney should be repointed or rebuilt as conditions may warrant.

3. Where soft coal is used it is often necessary to rebuild unlined chimney tops every few years, and all unlined chimneys, irrespective of fuel used, are very liable to become defective through disintegration of the mortar joints. In order to ascertain if chimneys need rebuilding, climb to the top and look inside. If mortar has begun to fall out from between the bricks it will soon do so all the way through the wall. Take an ice pick, a table knife, or other sharp implement and try to push it through the mortar; if you can do so, rebuild at once as follows:

Tear the chimney down to a point where mortar joints are solid, but at least 18 in. below the roof, get fire clay flue lining of the same size as the inside measurement of the chimney, set it in the top of the flue and build up with good brick and Portland cement mortar. This will make a solid chimney through the roof where there is greatest danger, and is the best that can be done unless the chimney is completely torn down and rebuilt. Preserve a clear space of at least 1 in. between the woodwork of the roof and the chimney wall, and connect the chimney with the roof by metal flashings. Build to a height above the roof as specified in Section I, paragraph 11, of the ordinance.

MINIMUM CHIMNEY FLUE SIZES AND HEIGHTS RECOMMENDED FOR FURNACES AND LOW PRESSURE STEAM AND HOT WATER BOILERS

Area dimensions given are inside measurements of the masonry walls of the chimney

Warm Air Furnace Capacity in Leader Pipe Sq. In.	BOILER CAPACITY		NUMBER OF HEATERS ATTACHED TO FLUE									
			1		2		3		4			
	Hot Water Rating Sq. Ft.	Steam (Direct) Rating Sq. Ft.	Heaters cross-connected forming a battery and attached to one flue opening									
			Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet
To 450	To 700	To 450	8 x 12	35	12 x 16	45	16 x 20	50	20 x 20	55		
800	900	600	8 x 12	35	16 x 20	50	20 x 24	55	24 x 24	60		
1000	1100	700	8 x 12	40	20 x 24	55	24 x 28	60	28 x 28	65		
	1500	1000	12 x 12	35	12 x 16	45	16 x 20	50	20 x 20	55		
	2500	1500	12 x 12	40	16 x 20	50	20 x 24	55	24 x 24	60		
	4000	2500	12 x 16	40	20 x 24	55	24 x 28	60	28 x 28	65		
	5800	3600	16 x 16	45	24 x 24	60	28 x 32	65	30 x 30	70		
	7300	4500	16 x 20	50	24 x 28	65	30 x 30	70	30 x 36	80		
	8700	5400	20 x 20	55	28 x 28	70	30 x 32	80	30 x 36	90		
	10000	6400	20 x 24	60	30 x 30	75	32 x 32	85	36 x 36	90		
	12000	7400	24 x 24	65	32 x 32	75	30 x 36	85	36 x 42	100		
	14000	8400	24 x 28	65	30 x 36	80	36 x 36	90	42 x 42	100		
	15000	9400	28 x 28	70	30 x 36	80	36 x 42	90	42 x 48	100		
	17000	10400	28 x 32	70	30 x 36	80	42 x 42	90	48 x 48	100		
	19000	11400	30 x 30	70	36 x 36	80						

Where round tile flue lining is used in place of rectangular, the nearest corresponding area shall be taken.