Ordinance No. 420

An Ordinance to amend the Alexandria City Code enacted as a whole July 2, 1940 and made effective August 5, 1940, by adding a chapter thereto relating to smoke regulation.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF ALEXANDRIA, VIRGINIA AS FOLLOWS:

Section 1. That the Alexandria City Code enacted July 2, 1940 and made effective August 5, 1940, be and the same hereby is amended by the addition of a chapter to be designed Chapter XXVII-A to read as follows:

CHAPTER XXVII-A

Smoke Regulation

Sec. 1. Definitions.

Whenever used in this chapter unless stated otherwise:

(a) The term "person" means any individual, firm, co-partnership, corporation, company, association, society, joint stock association, owner or part owner, and it includes any trustee, receiver, assignee, lessee, personal representative, or agent thereof.

(b) The term "smoke" means and includes small gas-borne particles of partly burned fuel, cinders, soot, dust, ash, carbon and carbon compounds, sulphur and sulphur compounds, tarry matter, and all colored matter produced by burning.

(c) The term "stack" means any chimney or smoke stack or other structure whether made of brick, tile, concrete, metal, or other material or a combination of any of these materials, intended for the emission of the products of combustion.

(d) The term "Ringleman Smoke Chart" means the Ringleman Smoke Chart published and used by the Bureau of Mines, United States Department of the Interior.

(e) The term "permit" means an installation permit issued by the smoke regulation engineer under the provisions of this chapter.

(f) The term "certificate" means a certificate of inspection issued by the smoke regulation engineer under the provisions of this chapter.

(g) The term "board" means the board of appeals created by the provisions of this chapter consisting of the city manager and the city engineer.

(h) The term "breeching" means any smoke flue or connection leading from a boiler or furnace to a stack.

(i) The term "horsepower" means the rated boiler horsepower (hp.) and shall be figured on the basis of 10 square feet of boiler heating surface per horsepower. One boiler horsepower shall be considered equal to 140 square feet of equivalent direct steam radiation of 224 square feet of water radiation.

(j) The term "boiler-heating surface" means all boiler surfaces in contact with hot gases.

(k) One square foot of equivalent direct radiation (E.D.R.) shall be considered equal to the heat emission of 240 B. t. u. per hour for steam and 150 B. t. u. per hour for hot water.

(l) The term "power boiler" means any boiler carrying over 15 pounds steam pressure.

(m) The term "heating boiler" means any boiler carrying not over 15 pounds steam or 30 pounds water pressure, or temperatures not exceeding 250° F.

(n) The term "fuel agreement" means a written agreement entered into between the owner of a building or plant and the City of Alexandria by the Smoke Regulation Engineer whereby the said owner in consideration of a permit being issued for the installation or replacement of a certain boiler or furnace agrees to burn only certain specified fuels.

Sec. 2. Emission of Dense Smoke Prohibited; Annoyance by Cinders, Dust, Ash, etc.

It shall be unlawful for any person to cause, allow or suffer smoke which has a density or shade equal to or greater than No. 3 of the Ringleman Smoke Chart to be discharged or emitted from any building, place, premises, device, plant, stack, engine, incinerator, opening, or combustion chamber within the corporate limits of the City of Alexandria, Virginia.

It shall be unlawful for any person to cause, allow or suffer cinders, dust, fly ash, solid particles, gas, steam or noisome odors to be discharged, emitted or to escape from any building, place, premises, device, plant, stack, engine, incinerator, fire, combustion chamber or motor to the detriment or annoyance of any person or persons not being therein or thereupon engaged or to an extent to constitute a nuisance.

All persons participating in any violation of this section in any way, by failure to act or otherwise shall be severally responsible.

Sec. 3. Smoke Regulation Department.

A department of smoke regulation for the City of Alexandria is hereby created. The head of this department shall be the smoke regulation engineer who shall be appointed by the city manager. The compensation of the smoke regulation engineer shall be fixed from time to time by the city council.

The city manager, upon recommendation of the smoke regulation engineer, may appoint such assistants to the smoke regulation engineer as may be necessary to properly carry out the purposes of this chapter, and their compensation shall be fixed from time to time by the city council.

The person so appointed smoke regulation engineer shall be an engineer qualified by training and experience in the theory and practice of the design, construction and operation of steam boilers and of furnaces, of heating and power operations and problems thereof, the burning of fuel, of smoke abatement and prevention, and he shall also possess demonstrated administrative ability.

Any assistant to the smoke regulation engineer appointed hereunder shall be duly qualified by technical training and experience, and he shall possess the ability to get along well with the public.

Sec. 4. Duties and Authority of Smoke Regulation Engineer; Injunctions.

The smoke regulation engineer is hereby charged with the duty generally to see that the purposes of this chapter are carried out and observed. He shall at all times keep suitable records of permits, inspections, certificates, tests, complaints, instruction, and all other matters coming under his administrative jurisdiction.

The smoke regulation engineer and any duly appointed assistant

shall have the right to enter in the performance of his duties any place or premises in the City of Alexandria and to obtain warrant for the purpose when necessary.

He shall have full authority and power to refuse a permit or certificate for any proposed installation or replacement or any installation or replacement in violation of this chapter; and, any court of record in the City of Alexandria shall have power to enjoin any proposed installation or replacement or any installation or replacement in violation of the provisions of this chapter.

The smoke regulation engineer is hereby empowered and authorized to make and enter into on behalf of the City of Alexandria fuel agreements with owners of buildings, plants, installations or replacements whereby such owner or owners in consideration of a permit being issued for the installation or replacement agrees or agree to burn only certain specified fuels.

Sec. 5. Installation Permits; Appeals.

It shall be unlawful for any person to construct, reconstruct, install, replace, alter or change any furnace, stoker, oil burner, gas burner, boiler, water heater, oven, incinerator, stack, flue, or smoke regulation or prevention appliance until and unless he shall have obtained an installation permit from the smoke regulation engineer. However, a permit shall not be required for kitchen ranges, for water heaters which do not burn solid or liquid fuel, and a permit shall not be required for any water heater with a tank of less than 100 gallons capacity.

Minor repairs which in no way alter or change the character of a unit or appliance and which are purely for maintenance may be made without a permit.

Boilers, combustion apparatus, and stacks of locomotives and steam boats are excepted from the requirements of the first paragraph of this section, but such exception shall in no way excuse or relieve a violation of section 2 of this chapter.

Applications for permits shall be made to the smoke regulation engineer on forms to be provided. Such drawings, specifications and other information as will give the smoke regulation engineer complete knowledge of the installation or replacement shall accompany the applications. Failure to give such information, the required drawings or required specifications shall be ground for refusal of a permit.

If the proposed installation or replacement conforms to the requirements of this chapter to the satisfaction of the smoke regulation engineer, and if proper provision is made for the control and prevention of smoke, and if the required fee has been paid, the smoke regulation engineer shall issue the permit; otherwise, the permit shall be refused. Any such application shall be considered and acted upon with dispatch, and in no case shall action be deferred for a longer period than two weeks.

In the event a permit is refused, the applicant shall have the right to appeal to the city manager and the city engineer who together shall constitute a board for the purpose of such appeals. In case the city manager and the city engineer cannot agree, the decision of the smoke regulation engineer shall be affirmed. If the decision of the smoke regulation engineer is reversed, a written order directing the issuance of the permit signed by both members of the board shall be given, and the same shall be kept as a part of the permanent records of the department.

The building inspector of Alexandria shall require that so much of the plans and specifications for any structure as come within the jurisdiction of the smoke regulation engineer be first submitted to the latter for approval. In case all information is not at that time available to the smoke regulation engineer so as to enable him to issue a permit, he may give temporary approval and thereupon the building inspector may proceed to issue his permit.

Sec. 6. Inspection Certificates; Appeals.

It shall be unlawful for any person to use or cause to be used any new, reconstructed, replaced, altered or remodeled furnace, stoker, oil burner, gas burner, boiler, water heater, oven, incinerator, stack, flue or smoke regulation or prevention appliance unless and until he shall have first obtained a certificate of inspection indicating that the smoke regulation engineer has inspected the installation or replacement and is satisfied that the provisions of this chapter have been complied with and that proper provision for the control and prevention of smoke has been made. The provisions of this paragraph, however, shall not apply to water heaters which do not burn solid or liquid fuel or to water heaters of any kind which have a tank of less than 100 gallons capacity.

Boilers, combustion apparatus, and stacks of locomotives and steam boats are excepted from the provisions of the foregoing paragraph, but such exception shall in no way excuse or relieve a violation of section 2 of this chapter.

If the installation or replacement conforms to the requirements of this chapter to the satisfaction of the smoke regulation engineer, and if proper provision is made for the control and prevention of smoke, and the required fee has been paid, the smoke regulation engineer shall issue the certificate; otherwise, the certificate shall be refused.

In case the certificate is refused, right of appeal from the decision of the smoke regulation engineer shall lie to the board. In the event the members of the board cannot agree, the decision of the smoke regulation engineer shall be affirmed. If the decision of the smoke regulation engineer is reversed, a written order signed by both members of the board shall be given directing the issuance of the certificate, and such order shall be kept as a part of the permanent records of the department.

Sec. 7. Issuance of Permit or Certificate does not Excuse Violations.

Issuance by the smoke regulation engineer of any installation permit or any inspection certificate for the construction, reconstruction, installation, replacement, alteration or change of any furnace, stoker, oil burner, gas burner, boiler, water heater, oven, incinerator, stack, flue or smoke regulation or prevention appliance shall not exempt or excuse any person from a violation of section 2 of this chapter.

The issuance of any such permit and/or certificate shall in no way be construed to indicate approval of the strength or safety of any installation or replacement or of any project of which such installation or replacement is a part; and the issuance of any such permit and/or certificate shall in no way indicate approval of things and matters covered by other ordinances or laws.

Sec. 8. Expiration of Permits

Work on any proposed installation or replacement or on the whole project of which a proposed installation or replacement is a part shall

be substantially started within one year of the time the permit is issued under the provisions of section 5 of this chapter; otherwise, the permit shall lapse and be void at the expiration of one year from the date of issuance thereof.

Sec. 9. Fees for Permits and Certificates.

The following fees shall be paid to the city collector before any permit or certificate is issued by the smoke regulation engineer:

(a) Installations, new buildings or projects	Permit	Certificate
Heating boilers, each: (furnaces, water heaters)		
Less than 1,200 sq. ft. of steam	$ 1.00	$ 2.00
1,200 to 5,000 sq. ft. of steam	2.00	3.00
5,001 to 25,000 sq. ft. of steam	3.00	4.00
Over 25,000 sq. ft. of steam	4.00	5.00
Power boilers, each: (furnaces, etc.)		
Less than 50 hp.	1.00	2.00
51 to 250 hp.	2.00	3.00
251 to 500 hp.	3.00	4.00
501 to 1,000 hp.	7.00	8.00
Over 1,000 hp.	8.00	12.00
Warm-air furnaces, each:		
Fire pot less than 30 inches in diameter	1.00	2.00
Fire pot 30 inches and over in diameter	2.00	3.00
Water Heaters, each:		
100 to 1,000 gallons	.50	.50
Over 1,000 gallons	2.00	3.00
Unclassified apparatus	2.00	3.00
(b) Installations or replacements in existing buildings or equipment.		
Heating boilers, each: (furnaces, water heaters)		
Less than 1,200 sq. ft. of steam	1.00	2.00
1,200 to 5,000 sq. ft. of steam	2.00	3.00
5,001 to 25,000 sq. ft. of steam	3.00	4.00
Over 25,000 sq. ft. of steam	4.00	5.00
Power boilers, each: (furnaces, etc.)		
Less than 50 hp.	1.00	2.00
51 to 250 hp.	2.00	3.00
251 to 500 hp.	3.00	4.00
501 to 1,000 hp.	7.00	8.00
Over 1,000 hp.	8.00	12.00
Warm-air furnaces, each:		
Fire pot less than 30 inches in diameter	1.00	2.00
Fire pot 30 inches and over in diameter	2.00	3.00
Water heaters, each:		
100 to 1,000 gallons	.50	.50
Over 1,000 gallons	2.00	3.00
Unclassified apparatus	2.00	3.00

All fees collected under the provisions of this chapter shall be paid into the general fund.

Sec. 10. Requirements for Installations and Replacements; Apparatus.

Installations, replacements or apparatus for which a permit is required under the provisions of section 5 of this chapter shall conform

to the following requirements insofar as they are applicable:

(1) The stack must be of sufficient height and cross sectional area to provide the necessary draft for the proper operation of the boiler and shall comply with all requirements of the building code.

(2) The top of the stack must be of such a height in relation to adjoining buildings so that the gases discharged will not become a nuisance to adjacent buildings and so that down drafts will be prevented.

(3) A clean-out door must be provided at the base of the stack.

(4) The stack must be so located in reference to the boiler as to permit of a well-designed breeching of adequate area and having a minimum number of bends or turns and with the shortest practicable length.

(5) The boiler room must be of sufficient height to allow for the installation of boilers of sufficient capacity to carry the full required load and having ample combustion space in the boiler furnace. Sufficient head room must be provided for installation of a breeching of proper design and to allow for accessibility to manholes and valves connected to boiler.

(6) Sufficient floor space must be provided to allow for the proper operation of the boiler, including the use of shovel and firing tools, removal of boiler tubes and making necessary repairs, cleaning boiler tubes, furnace firebox, combustion chambers, and to allow for easy access to furnace doors and other openings in and about walls of boiler settings or furnaces and for cleaning and removal of soot and ash from the breeching and stack.

(7) Sufficient exits, properly located, must be provided to allow agress in case of emergency.

(8) The fuel storage space shall be partitioned off from the boiler room proper and be so located as not to interfere with the efficient operation of the boiler. Where a different kind of coal is required for a water heater, provision must be made for separate storage. There must be a satisfactory place for delivering coal and removing ashes from the building so that dirt and dust may be kept to a minimum.

(9) Provision must be made to permit the unrestricted admission to the boiler room of a sufficient amount of air to secure smokeless combustion of the fuel and to properly ventilate the room in which the fuel-burning equipment is located.

(10) Incinerators must be provided with a separate stack and be built in a manner approved by the Smoke Regulation Engineer.

(11) Boilers:

(a) Power boilers shall be equipped with underfeed stoker apparatus to burn pulverized coal or with oil burners, or gas burners, which in any case shall be approved by the Smoke Regulation Engineer unless owner of building or plant enters into a Fuel Agreement. No such agreement shall be made for boilers having more than 250 square feet of heating surface.

(b) Heating boilers having an Equivalent Director Radiation rating of more than 1,200 square feet of steam radiation or 1,800 square feet of water radiation shall be equipped with underfeed stoker, apparatus to burn pulverized coal, oil burner, or gas burner, which in any case shall be approved by the Smoke Regulation Engineer unless owner of building or plant enters into a fuel agreement. No such agreement shall be made for boilers having more than 5,000 square feet of steam radiation or the equivalent.

(c) Heating boilers having an Equivalent Direct Radiation rating of less than 1,200 square feet of steam radiation, or of 1,800 square

feet of steam radiation, shall burn coke, anthracite, or shall be equipped with mechanical stoker, oil burner, or gas burner approved by the Smoke Regulation Engineer.

(b) Low pressure steam boilers, when mechanically fired, shall be equipped with a low water cutoff, or similar arrangement, so located as to automatically cut off the fuel supply in case the water level falls to a point not lower than the bottom of the water glass. The water cutoff shall be set in accordance with A.S.M.E. Code for low pressure Heating Boilers.

(c) Gravity feed, magazine boilers designed exclusively for the burning of coke or anthracite may be installed in all sizes, subject to the requirements and approval of the Smoke Regulation Engineers.

(d) Every boiler shall be constructed and installed in accordance with the provisions of these Regulations, and the Boiler Code of the American Society of Mechanical Engineers, Section I to VII, inclusive, and Amendments and Interpretations thereto, made and approved by the Council of the Society to date. Every boiler shall bear the A.S.M.E. symbol and number, and the Manufacturers Data Report form shall be provided when requested.

12. Stokers:

(a) Underfeed stokers shall have minimum furnace heights as follows:

Rating—square feet steam radiation	1,000 to 2,499	2,500 to 6,999	7,000 to 10,999	11,000 to 13,999	14,000 to 17,499	17,500 to 20,999	21,000 to 25,000
Equivalent horsepower	10-18	19-50	51-80	81-100	101-125	126-150	151-175
	Inches	Inches	Inches	Inches	Inches	Inches	Inches
Compact type	36	42	48	54	60	66	72
L.F.B. type	48	54	60	66	72	78	84
H.R.T		42	48	54	60	66	72
Cast Iron	36	42	48	54	60	66	--

Abbreviations: L.F.B.—locomotive firebox;
H.R.T.—horizontal return tubular

NOTE: In using above table, take rated boiler horsepower or radiation, whichever is larger.

(b) All dimensions are from the stoker dead plate (or dump grate) to the crown sheet (or equivalent) of the boiler. On down draft boilers the water grates shall be considered the equivalent of the crown sheet, unless they are removed.

(c) The above figures are considered to be minimum dimensions and shall be increased wherever the boiler is to carry an overload or has peak-load conditions to be met.

(d) Stoker designed for anthracite will be given special ruling.

(e) Horizontal water tube heating boilers in sizes up to 25,000 square feet of steam radiation shall, when horizontally baffled, have the same setting heights as compact type boilers; when vertically baffled they shall have the same setting heights as locomotive firebox type boilers. For boilers above 25,000 square feet use table below.

(f) The minimum furnace heights of all other types and sizes of water tube boilers equipped with underfeed stokers, to be operated up to 150 percent rating, shall be as follows:

Measurement of setting height	Type of boiler	Multiple retort		Single retort	
		Min.	Pref. Min.	Min.	Pref. Min.
		Ft. In.	Ft. In.	Ft. In.	Ft. In.
Floor line to bottom of header above stoker	Horizontal, all sizes	11—0	13—0	9—0	11—0
Floor line to center of mud drum	Incl. H.M.D. all sizes	7—6	8—6	6—6	8—6
Floor line to top of mud drum	Incl. V.M.D. all sizes	6—0	7—0	5—0	7—0
Floor line to center of mud drum	Vert. H.M.D. all sizes	3—6	5—0	3—6	5—0
Floor line to top of mud drum	Vert. V.M.D. 150 h.p.	4—6	5—0	4—6	5—0
Floor line to top of mud drum	Vert. V.M.D. 250 h.p.	5—6	6—0	5—6	6—0
Floor line to top of mud drum	Vert. V.M.D. 500 h.p.	6—0	6—6	6—0	6—6

Abbreviations: Incl.—inclined; vert.—vertical; H.M.D.—horizontal mud drum; V.M.D.—vertical mud drum; min.—absolute minimum; Pref. min. —preferred minimum, i. e., the heights recommended.

(g) For power boilers equipped with underfeed stokers, to be operated at more than 150 per cent rating, special ruling shall be obtained from the Smoke Regulation Engineer. Design of all stoker installations shall be submitted to the Smoke Regulation Engineer for approval.

(h) Stokers shall be installed so that the bottom of the boiler water leg will be suitably protected. Boiler doors shall be of sufficient size and so located that ash and clinker can be easily removed without disturbing the fuel bed.

(i) On all stoker installations a clean-out door shall be provided in the breeching and at the base of the stack and an accessible damper in the breeching fitted with a handle and quadrant or the equivalent so arranged that it can be clamped in position and be conveniently operated.

(j) When stokers are rated in terms of coal fed per hour or square feet of equivalent direct steam radiation (E.D.R.) such rating shall be based on nut and slack coal with a heat content taken as not greater than 14,000 B. t. u. per pound for bituminous coal and 12,400 B. t. u. for buckwheat anthracite, with a combined boiler and stoker efficiency of not to exceed sixty (60) per cent for stoker capacities up seventy-five (75) pounds of coal per hour and not to exceed sixty-five (65) per cent for stoker capacities over seventy-five (75) pounds per hour.

A certified rating sheet based on the above together with all other necessary information shall be supplied for every stoker, subject to the approval of the Smoke Regulation Engineer.

An allowance of not less than thirty-five (35) per cent shall be provided for piping and pickup.

(k) The rating of any stoker shall not be less than the rating of the boiler with which it is to be installed, except that where the boiler is

to be operated in excess of its rating the stoker shall be of sufficient capacity to adequately carry such over-rating.

(13) Pulverized Coal:

(a) When pulverized coal is to be used as fuel, the required combustion space for all boilers up to 500 horsepower and having refractory walls, shall be determined on the basis of a maximum heat liberation of 20,000 B. t. u.'s per cubic foot of combustion space per hour. For larger boilers and other types of walls, maximum heat liberation shall be determined for each individual case. An acceptable method of collecting fly ash from the stacks or breechings of all pulverized coal plants provided. Design of all pulverized coal installation shall be submitted to the Smoke Regulation Engineer for approval.

(14) Oil:

(a) When oil is to be used as a fuel, the required combustion space for power boilers up to 500 horsepower shall be determined on a basis of a maximum heat liberation of 30,000 B. t. u.'s per cubic foot of combustion space per hour. For larger boilers special ruling shall be obtained from the Smoke Regulation Engineer.

(b) The required combustion space for heating boilers shall be determined on the basis of a maximum heat liberation of 25,000 B. t. u.'s per cubic foot of combustion space per hour. For specially designed boilers the combustion space shall be determined according to the individual design of the equipment.

(c) All oil burners installed shall be approved by the National Board of Fire Underwriters to burn the grade of oil which will be used. Design of all oil-burner installations shall be submitted to the Smoke Regulation Engineer for approval.

(d) Where oil of grade 5 or 6 is to be used, provision shall be made for heating and automatically maintaining the temperature of the oil at not less than 180° F. Electric preheaters shall be provided for starting when there is not steam available.

(15) Net Load:

(a) "Net Load" shall be contrued to mean all radiation used for heating purposes, exclusive of piping, and reduced to the equivalent of direct cast-iron radiation in a temperature of 70° F., which shall be calculated on a basis of 240 B. t. u.'s per square foot per hour for steam and 150 B. t. u.'s per square foot per hour for water.

(b) Any generator, coil in firebox, indirect heater, or other device attached to boiler, used for heating water for domestic purposes, shall be included in net load and shall be calculated in equivalent direct radiation in accordance with the rules of the Heating and Piping Contractors National Association as shown in their Net Load Recommendations Manual.

(c) The net load capacity of heating boilers shall be the net load recommendations of the Heating and Piping Contractors National Association, revised and amended to date.

(d) The Equivalent Direct Radiation (E.R.D.) rating of cast iron boilers shall be obtained by adding not less than thirty-five (35) per cent to the Net Load rating; for steel heating boilers the E.D.R. ratings as determined by the Code of the Steel Heating Boiler Institute (S.H.-B.I.) shall be used.

(16) Clearance Around Boilers:

(a) All boilers or boiler settings shall have at least three (3) feet clear space on each side, in the rear and in front of oil burner or stoker, except that in existing buildings, this may be reduced by the Smoke

Regulation Engineer, if after inspection it is found that it is impractical to obtain such clearances. In addition, sufficient space must be provided to remove boiler tubes.

(b) Where replacement or additional installations of boilers are made in existing buildings the minimum height of the boiler room shall be such as to provide not less than six (6) inches clear space above the highest point of any valve or other fitting when it is at maximum opening, or stems and levers at their greatest height. In new or reconstructed buildings not less than four (4) feet shall be provided between the top of the boiler proper and the ceiling or other obstruction.

(17) Stacks:

(a) Power boilers having more than 120 square feet of boiler heating surface shall have a stack of sufficient height or shall have an induced draft fan to give a minimum draft of 0.20 inches of water over the fire in the furnace under normal working conditions. No such stack shall be less than 45 feet above the ground line, unless gas is used as fuel.

(b) Size and height of stacks for power boilers shall be based on approved chimney practice, taking into consideration draft losses in boiler and breeching.

(c) Heating plants having boilers with a net load rating of more than 1,200 square feet of steam radiation or 1,800 square feet of water radiation, shall have a minimum draft of 0.15 inches of water over the fire in the furnace under peak load conditions.

(d) With the exception of gas fired boilers or heaters, the following table shall in general be used as a guide. Stack sizes are inside dimensions and plans should be so marked. The sizes given are for one boiler and are minimum.

(e) Where boiler capacity is in excess of ratings shown in table, stack shall be figured on the same basis as for power boilers.

(f) If it is impractical to obtain the height of stack as indicated an induced draft fan may be used, subject to the aproval of the Smoke Regulation Engineer provided the discharge from the stack will not become a nuisance to neighboring buildings.

Stack Table for Heating Boilers

Rectangular flue lining Boiler rating square feet of radiation E.D.R.		Actual inside dimensions	Standard flue lining	Round flue Actual inside diameter	Minimum* Height above grate
Steam to	Water to	Inches	Inches	Inches	Feet
450	720	8x12	8½x13	10	35
800	1,280	12x12	13x13	12	35
1,000	1,600	12x16	13x18	15	40
1,500	2,400	16x16	18x18	18	40
2,000	3,200	18x18	20x20	18	45
2,500	4,000	17x21	20x24	20	50
3,000	4,800	21x21	24x24	22	55
3,500	5,600	21x21	24x24	22	55
4,000	6,400	22x22	- --	24	60
5,000	8,000	24x24	-----	26	60
6,000	9,600	26x26	- ---	28	65
7,000	11,200	26x28	---	28	65
8,000	12,800	28x28	-----	30	70
9,000	-----	30x30	-----	32	70

10,000	32x32	34	75
12,500	34x34	38	75
15,000	36x36	40	80
17,500	38x38	42	85
20,000	40x40	44	90
25,000	42x42	46	100

*Height must be increased if breeching is more than ten (10) feet long or has more than one bend exclusive of fly ash collector.
NOTE—For each additional boiler add not less than seventy-five (75) percent of the area and ten (10) feet to the height as given in table.

(g) The inside walls of each stack shall be smoketight, vertical, free from offsets, or constrictions, and have a clean-out opening with a tightly fitted door. All stacks shall conform to requirements of the building code.

(h) The top of any stack shall extend sufficiently above the roof of the building of which it is a part, and shall extend above or be far enough away from any nearby building to prevent down drafts or the creation of a nuisance by the discharge of smoke or the gases of combustion.

(i) Where an existing stack is so located that it will constitute a nuisance to the occupants of a building about to be built, the owner of the new building shall be required either to extend the existing stack or make other provisions to meet the approval of the Smoke Regulation Engineer.

(j) Boilers or furnaces located in separate rooms or buildings shall each have a separate stack or flue lining in the stack.

(k) The tops of boiler stacks shall not be covered with caps or screens.

(l) Stacks shall be as nearly square or round as possible. Where the stack is rectangular or oval in cross section, the greatest dimension shall not exceed twice the smallest.

(18) Breechings:

(a) Breechings shall be as nearly square or round as possible. Where the breeching is rectangular or oval in cross section the greatest dimension shall not exceed twice the smallest. The minimum radius of all bends shall not be less than the width of breeching at point where bend occurs.

(b) Breeching shall be as short and straight, free from bends or curves, drops below horizontal, or other restrictions, as possible.

(c) Where separate water heater is to be provided the breeching may be connected directly to the stack but above the entrance of the boiler breeching.

(d) Every breeching shall be provided with sufficient clean-out openings having tightly fitted doors, and of sufficient size so that all parts of breeching may be easily cleaned.

(e) The draft loss in the breeching shall be taken into consideration in the design of the boiler plant and stack.

(f) A layout of breeching must accompany application for permit.

(g) Fly ash collectors shall be installed in the breeching of all heating boilers equipped with stokers and burning bituminous coal. The collector shall be installed near the stack, it shall have a vertical baffle interposed in the gas stream in such a way as to cause the gas stream to be directed down into the collector and then up to the stack opening. The free area through the collector shall be at least one third greater

than the area of the breeching. The collector shall have a large pocket for storing the fly ash and a gate or valve at the bottom for conveniently clearing the pocket. The collector design shall be approved by the Smoke Regulation Engineer. Commercial manufactured fly ash collectors may be used if approved by the Smoke Regulation Engineer.

Fly ash collectors shall be installed in the breeching of all coal fuel Power Boilers. The design of such collectors shall be approved by the Smoke Regulation Engineer.

(19) Air to Boiler Rooms:

(a) Each boiler or furnace room shall have an opening or openings to the external air, to provide sufficient air for proper combustion, as may be determined by the Smoke Regulation Engineer.

(20) Smoke Indicators:

(a) All fuel-burning plants installed after the enactment of this ordinance and having more than 300 square feet of boiler heating surface or its equivalent shall be equipped with smoke indicators, mirrors, or similar devices, approved by the Smoke Regulation Engineer to enable the firemen to easily observe smoke conditions from the boiler room at all times, unless the top of the stack is readily visible to the firemen. This provision shall apply to all boilers when new oil burners or mechanical stokers are installed. Where oil of grade 5 or 6 is to be used, a smoke alarm shall be provided.

(21) Vertical Boilers:

(a) Vertical fire-tube boilers shall be installed only upon entering into a fuel agreement unless such boilers are equipped with oil or gas burners. Only one boiler of this type containing not more than 250 square feet of heating surface shall be permitted in a plant.

(22) Scotch Marine Boilers:

(a) Scotch marine boilers shall be installed only upon entering into a fuel agreement unless such boilers are equipped with oil or gas burners. If equipped with oil burner, a dutch oven shall be provided. An underfeed stoker may be permitted where it is specially designed for this type of boiler. When hand fired only one boiler of this type containing not more than 250 square feet of heating surface shall be permitted in a plant.

(23) Warm-Air Furnaces:

(a) Warm-air furnaces having 7 square feet or more of grate surface shall be equipped with underfeed stoker, oil or gas burner, approved by the Smoke Regulation Engineer unless owner of building or plant signs a fuel agreement.

(b) Warm-air furnaces having less than 7 square feet of grate surface shall burn coke, anthracite, low volatile coal, or shall be equipped with underfeed stoker, oil or gas burner, approved by the Smoke Regulation Engineer.

(c) Heating plants having warm-air furnaces with a total of 7 square feet or more of grate surface shall have a stack of sufficient height to give a minimum draft of 0.15 inches of water over the fire in the furnace under normal working conditions.

(24) Water Heaters:

(a) Water heaters shall burn coke or anthracite or shall be equipped with underfeed stoker, gas or oil burner.

(b) When a heating boiler is equipped with an underfeed stoker and a hand-fired water heater is used, a separate bin shall be provided for fuel for the heater.

(25) Incinerators:

(a) Incinerator design shall be approved by the Smoke Regulation Engineer and shall have a stack separate from that of the boiler or furnace.

(b) The stack shall terminate in a substantially constructed spark arrester made so as to project above the top of the stack and having openings not larger than one-fourth inch.

Sec. 11. Rules of the Department.

Subject to the approval of the city manager, the smoke regulation engineer is hereby authorized and empowered to make such rules of procedure as may be necessary and proper for the administration of his department.

Sec. 12. Relation of this Chapter to Building Code and other Laws.

The provisions of this chapter are intended to prevent the production and control the emission of smoke and the products of combustion, and they are not intended to repeal any provisions of the Building Code, the provisions of any boiler inspection law, or any law providing for the strength and safety of materials.

Sec. 13. Penalties.

Any person who violates any provision of this chapter or who fails or refuses to perform any duty required herein shall be guilty of a misdemeanor, and he shall be fined not less than ten dollars or more than three hundred dollars or shall be imprisoned not more than three months or both.

Each day's continuance of a violation of the provisions of this chapter shall constitute a separate offense.

Sec. 14. Intention and Effect.

The provisions of this chapter are adopted in the exercise of the police power granted to the City of Alexandria by its charter and by general law.

If any section, part, or provision hereof should be declared invalid for any reason by a court of final jurisdiction, such section, part or provision shall cease to operate; but, the remainder of the chapter and every part thereof shall continue in full force and effect.

Section 2. That this ordinance shall take effect on the day following its publication in the Alexandria Gazette.

Approved April 18, 1944.

WILLIAM T. WILKINS,
Mayor.