

CHAPTER XVI
PROTECTION OF FURNACE AND BOILER ROOMS, AIR
CONDITIONING REFRIGERATION MACHINERY ROOMS
(Including excerpts from the N. C. Building Code, Vol. I)

1600—BOILER & FURNACE ROOMS

Boiler rooms are required for all boilers using gas, oil or solid fuel (coke or coal). For electric boilers either a boiler room or a machinery room is required in accordance with the N. C. Building Code, Vol. I. The chimney may be omitted where electric boilers are installed. All boiler rooms and machinery rooms shall be adequately ventilated. (See Sec. 1504 and for boilers above 15 psi refer to the N.C. Boiler Code).

Electric furnaces and duct heaters are not required to be installed in a boiler room or machinery room unless separation is required by the building code.

Gas furnaces using other than natural gas shall be installed in 1 hr. separation in accordance with the requirements of Section 2901, N. C. Building Code, Vol. I.

Natural gas furnaces shall be installed either with one hour separation in accordance with requirements of Section 2901 of the N.C. Building Code, Vol. I, or on the roof top in accordance with Section 2902 (c).

Oil fired furnaces shall be installed with one hour separation in accordance with the requirements of Section 2901 of Vol. I.

1601—THE FOLLOWING SECTIONS ARE QUOTED FROM THE N.C. BUILDING CODE, VOL. I, CHAPTER 29:

SECTION 2900—INSTALLATION STANDARDS

- (a) Heat producing appliances and systems (including incinerators) shall be designed and installed so as to be reasonably safe to persons and property. Heat producing appliances and systems (including incinerators) designed and installed in conformance with the applicable provisions of Appendix B and H and Volume III shall be evidence that the design and installation of such appliances and systems are reasonably safe to persons and property.
- (b) Ventilating, air conditioning, blower and exhaust systems shall be installed so as to be reasonably safe to persons and property. Installations of such appliances and systems in conformance with the applicable provisions of Appendix B and H and Volume III shall be evidence that such appliances and systems are installed so as to be reasonably safe to persons and property.
- (c) **BOILERS:** See N.C. State Boiler Code published by N.C. Department of Labor, Raleigh.
- (d) Except as may specifically be provided for by State Law or in Volume III of this Code, the following Standards of the National Fire Protection Association are adopted:

Oil Burning Equipment	NFPA 31-68	72
Spray Finishing	NFPA 33-69	73
Gas Appliances and Gas Piping, Installation of	NFPA 54-69	
	& 54A-69	
Air Conditioning and Ventilating (Non-Residential) ...	NFPA 90A-69	73
Warm Air Heating and Air Conditioning		
Residence Type	NFPA 90B-68	73

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Blower and Exhaust Systems NFPA 91-6173
Restaurant Cooking Equipment, Ventilation NFPA 96-6973
Smoke and Heat Venting Guide NFPA 204-68

SECTION 2901—FURNACE AND BOILER ROOM

- (a) Every Central Heating Boiler with an input capacity of 250,000 B.T.U. (British Thermal Units) or over, installed in any building, other than a one- or two-family dwelling, shall be enclosed and separated from the rest of the building by walls, partitions, floor and ceiling of not less than one-hour fire resistive construction. Not more than two Central Heating Boilers, and/or Furnaces shall be permitted in any one tenancy in any building unless all are enclosed and separated by walls, partitions, floors and ceilings of one-hour fire resistive construction.
- (b) A Central Heating Boiler of any input capacity installed in a building having a capacity for its particular use of more than seventy-five persons, or Group "D" Institutional Occupancy, or Group "E" Theater or Assembly Occupancy, or Group "H" Special Hazardous Occupancy, shall be separated from the rest of such building by walls or partitions, floor and ceiling construction having a fire resistive rating of not less than one hour, except as required below.
- (c) Every steam boiler carrying more than fifteen (15) pounds per square inch pressure with a rating in excess of ten (10) boiler horsepower, installed in a building other than one of Group G, Industrial Occupancy, shall be located in a separated room, or compartment, and separated from the rest of the building by walls or partitions having at least one-hour fire-resistance and by floor or ceiling construction having not less than one hour fire-resistance, provided, however, that when in the opinion of the Building Official it is desirable to provide for the venting of a possible explosion upward this rating may be reduced in accordance with the hazard existing.

SECTION 2902—SPECIAL REQUIREMENTS FOR FURNACE AND FUEL ROOM AREAS IN PUBLIC OWNED SCHOOL BUILDINGS

- (a) Furnace and fuel room areas shall be separated from other sections of the building by an 8 inch masonry wall with no opening into this area except to the outside of the building. The roof or ceiling construction shall have a fire resistance rating of not less than 2 hours.
- (b) In existing school buildings the furnace and fuel room areas shall be separated from other sections of the building by an 8 inch masonry wall with no openings into this area except to the outside of the building. An existing roof construction not having a fire resistance rating of 2 hours shall be protected with two layers of plaster on metal lath, one inch thick, and the two layers separated by a two inch air space. Care shall be taken to chamfer the plaster 2 inches into the surrounding masonry walls to secure a draft tight seal.
- (c) A.G.A. approved enclosed furnaces incorporating integral, total enclosures and using only *outside air* for combustion may be installed in public schools provided the following conditions are met:
 - (1) Buildings must be *one* story only, and such installations may not be made in any multi-story building.
 - (2) In classrooms or other similar spaces (which must be above grade), furnaces may be installed in the outside wall at floor level or above the roof (roof mounted). No other location is acceptable.
 - (3) All gas piping to be exposed (that is, above ground) shall be run on the outside of the building and protected from damage.

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- (4) All vents shall extend above the roof.
- (5) The furnace shall bear the label of A.G.A. or U.L. as an "enclosed furnace." The vent shall be A.G.A. or U.L. Labeled.
- (6) The installation shall be in accordance with conditions of Label and NFPA-54.

1602—MACHINERY ROOMS

Every machinery room required by this Code shall be of at least one-hour fire-resistive construction with all openings protected with a one-hour fire assembly.

~~There shall be no direct opening between a room containing equipment using Group 2 or Group 3 refrigerants and a boiler room.~~ 6-8-76

There shall be no direct opening between any machinery room containing any Group 2 refrigerant and any room or space in which there is an open flame, spark-producing device, or heating surface in excess of 800 degrees F.

Every machinery room containing any Group 2 refrigerant shall have at least two means of exit located at least one-fifth the perimeter of the room apart. Exit openings shall be not less than three feet by six feet eight inches (3' x 6' 8").

Every machinery room containing any Group I refrigerant shall have at least one means of exit. Such exit opening shall be not less than three feet by six feet eight inches (2' x 6' 8").

Every machinery room door shall open in the direction of egress.

Every machinery room shall have an area of not less than fifty square feet (50 sq. ft.).

An unobstructed working space not less than two feet six inches (2' 6") in width and not less than seven feet (7') in height shall be provided around not less than two adjacent sides of all moving machinery in any machinery room.

1603—MACHINERY ROOM VENTILATION

Every machinery room shall be provided with means of ventilation to the outer air. Such ventilation shall be either:

1. An exhaust system of ventilation arranged to provide a complete change of air in such room at least once every five minutes and discharge to the outer air at a location not less than twenty feet (20') from any exterior door, window or ventilation air inlet in any building.

Each exhaust ventilation system shall be controlled by a readily accessible emergency ventilation switch located within two feet (2') of the switch specified in Section 1604 and the switch shall be labeled to comply with Chapter XIX.

2. Gravity ventilation openings to the outside of the building having a cross-sectional area of one-twentieth of the floor area of the machinery room, but in no case need the area of the openings be more than one thousand square inches (1000 sq. in.). Such openings shall be so installed that approximately one-half of the required area is located within twelve inches (12") of the ceiling and one-half of the required area is located within twelve inches (12") of the floor of the room. Every portion of the lower opening shall be horizontal or slope downward from the opening in the machinery room to the exterior of the building at or above the adjacent ground level.

1604—EQUIPMENT IN A MACHINERY ROOM

No direct-fired appliances shall be located in any machinery room.

(6-8-76)—Section 1604—Page 16-3—Revise to read as follows: "Refer to Chapter 19 of this code for requirements governing equipment located in refrigeration machinery rooms." 16 - 3]

See next page for new sections 1605

(6-11-74)—Page 16-4—Add new Section 1605 to read as follows: 1605—*Rooftop Mounted Equipment*—Fire dampers are required only in ductwork which penetrates a fire rated roof assembly and is attached to a roof mounted unit, containing gas or oil fired equipment, having a clearance of less than 18" from the bottom of the unit and the roof surface. Fire dampers shall be located at the roof line.