CHAPTER XXIV—SAFEGUARDS DURING CONSTRUCTION

SECTION 2400—REGULATIONS OF LABOR DEPARTMENT

Please refer to the following publications of the N. C. Department of Labor, Raleigh, N. C.

Rules and Regulations governing THE CONSTRUCTION INDUSTRY.

Bulletin 1—TRENCHING.

Bulletin 3—MATERIAL HOISTS.

SECTION 2401—GENERAL

The temporary use of streets or public property for the storage or handling of materials or of equipment required for construction or demolition, and the protection provided to the public shall be in accordance with the provisions of this chapter.

2401.1—ALLOWABLE USE OF PUBLIC PROPERTY DURING CONSTRUCTION

The amount of space and conditions under which public property may be used for construction or demolition purposes shall be as set forth below:

(a) One-third (⅓) of the width of street that is adjacent to the curb in front of the building being erected and for which a permit has been issued. If street in front of property adjoining such building is to be used for similarly limited storage, a due waiver of claim against the applicable governing authority for damages on account of such use, issued by the owner of such property, must be filed with the Building Official before such use shall be allowed.

(b) Provisions under which street or sidewalk space may be used:

(1) That such one-third (⅓) allocated space or any portion thereof shall not come within five (5) feet of a rail or railway track.

(2) That a walkway be constructed in the outer portion of the permissible occupied street space, conforming to the requirements of Section 2401.3.

(3) That no building material, fence, shed or any obstruction of any kind shall be placed so as to obstruct free approach to any fire hydrant, lamp post, manhole, fire alarm box, or catch basin, or so as to interfere with the passage of water in the gutter. Protection against damage shall be provided to such utility fixtures during the progress of the work, but sight of them shall not be obstructed.

(4) That a ten (10) foot clear roadway be maintained through any alley located along the building site.

(5) That proper precaution shall be made during construction to prevent concrete, mortar washings, or any other material from entering a sewer.

(6) Unless the person already has a satisfactory bond posted, the person or persons to whom a permit is issued for such purposes as stated above, shall post with the applicable governing authority a bond of such type and amount as may be deemed advisable by the applicable governing authority as protection from any and all liability.

2401.2—WHERE COVERED WALKWAYS ARE REQUIRED

(a) During the erection or demolition of any building exceeding one (1) story in height that is located at a distance less than ten (10) feet or less than one-quarter (¼) of the height of the building from any street or alley property line, or when required by the Building Official, a roof covering for the entire length of the project shall be provided over the temporary or permanent sidewalk, from the time the construction or demolition extends above the second floor level until materials are no longer being used or handled on the front above such walk.

(b) Buildings having their exteriors altered or repaired in an extensive manner involving any hazard shall be provided with a covered walk as required for new structures during erection.

EXCEPTION:

Where, in the opinion of the Building Official, a covered walk is not necessary, a permit may be issued to block off part of the sidewalk and have a temporary walk constructed as provided in Section 2401.3.

2401.3—CONSTRUCTION OF WALKWAYS FENCES AND PROTECTIVE COVERINGS

Before any construction work is commenced the owner or his agent shall construct a temporary walkway in conformity with this section.

(a) All fences, barriers, or temporary structures of any kind located on public highways, shall be so constructed as not to obstruct vision at the intersection of streets.

(b) Walkways shall be not less than four (4) feet wide in the clear except that in congested districts the Building Official may require a walkway as wide as, in his opinion, is necessary. Walks shall be built in safe and substantial manner and be maintained in that condition at all times. A smooth handrail of substantial construction, not less than three (3) feet high, shall be provided on the traffic or street side of the walkway, and also on the building side when considered necessary by the Building Official.

(c) Where the distance from building to street or alley property line is less than half the height of the building, a fence of substantial solid construction at least eight (8) feet high shall be provided on the building side of the walkway.

(d) Roof coverings over walkways, as required by Section 2401.2, shall be constructed of not less than one layer of two (2) inch nominal dimension wood plank spanning not over three (3) feet between supports, or equivalent decking. The framework supporting the walkway covering shall be well braced and designed to support at least one hundred fifty (150) Lbs. per Sq. Ft. but the top deck shall be designed to carry not less than two hundred fifty (250) Lbs. per Sq. Ft. The roof covering shall be of width sufficient to cover the entire walkway or sidewalk, and shall be made watertight. Suitable provision shall be made for adequate lighting of the walk under the covering, at all times. A minimum clearance of eight feet six inches (8'-6") shall be maintained above walkways.

2401.4—WALKWAYS OVER EXCAVATED AREAS

When the area occupied by the sidewalk or temporary walkway is to be excavated, such walk shall be made of boards not less than two (2) inches nominal dimension designed to support a load of not less than one hundred and fifty (150) pounds per Sq. Ft., provided with suitable ramps at each end. Such walkways shall be provided with a fence and handrails on each side.

2401.5—STORAGE OF MATERIALS OVER WALKWAYS

Whenever roofs of walkways are used for the storing of materials, it shall be designed for the load to which it is to be subjected and a railing and footboard shall be installed so as to prevent the materials from spilling into the streets. The posts and/or other supporting members on the street side shall be protected so as to insure against failure due to impact from street traffic.

2401.6—WALKWAYS TO BE KEPT IN REPAIR

The street side of any barricade or fence, handrails and sidewalks shall be kept reasonably smooth and in good repair while construction work is in progress, or while such barricades, fences, or walkways are placed on or over public property.

2401.7—CLEANING OF SIDEWALKS AND STREETS

The owner or his agent, upon the completion of the building, shall immediately remove all walkways, debris or any other obstructions and leave such public property in as good a condition as it was before such work was commenced.

2401.8—RED LIGHTS REQUIRED

Every walkway shall be kept well lighted continuously between sunset and sunrise and the outer edge of the occupied space of the street or sidewalk shall have placed thereon "red lights" which shall burn continuously between sunset and sunrise.

2401.9—SAFETY REQUIREMENTS DURING CONSTRUCTION

(a) CONSTRUCTION SCAFFOLDS, HOISTS, EQUIPMENT, ETC.—All equipment such as temporary stairs, ladders, ramps, scaffolds, hoists, runways, barricades, chutes, elevators, etc., as required for the execution of any construction work shall be substantially constructed and erected to insure the safety of the workmen using them or passing under, on or near them. Where a large amount of scaffolding is used the Building Official may require the use of non-combustible material or fire retardant treated wood. The flame proofing of tarpaulins may also be required by the Building Official where, in his opinion, the fire hazard warrants such precaution.

(b) SANITATION—Adequate sanitary facilities for the convenience of all workmen shall be provided. These facilities shall be kept in a clean and sanitary condition throughout the duration of the work. The temporary workman's convenience shall be enclosed, screened, and weatherproofed and shall be connected to a sewer. Upon removal of the temporary facilities the sewer connection shall be removed and the sewer capped. In lieu of connecting to a sewer, the temporary facility may be a portable, enclosed, chemically treated, tank-tight unit.

(c) STANDPIPES—In buildings under construction over three (3) stories in height, standpipes where required by the Code shall be installed as the work progresses. Connection outlets shall be provided at each floor level and all such connections and fittings from ground level up shall be designed to fit the fire department equipment. All standpipes shall be not less than two and one-half inches (2½") in diameter and so located that 100 feet of one and one-half (1½) inch hose will reach within 25 feet of the most remote part of each floor area.

2401.10—PROTECTION OF ROOFS AND SKYLIGHTS OF ADJOINING BUILDINGS

When a building or structure is to be carried above the roof of an adjoining building, protection for the skylights and roof of such adjoining building shall be provided, at his own expense, by the person constructing or causing the construction of such building or structure; provided that if the owner, lessee or tenant of the adjoining building should refuse permission to have the roofs and skylights protected, the responsibility and expense for the necessary protection shall devolve on the person refusing such permission.

CHAPTER XXV—FIRE RESISTANCE STANDARDS FOR MATERIALS AND CONSTRUCTION

SECTION 2501—GENERAL

(a) Fire protection requirements of this Code are based on fire resistance ratings. Materials, thicknesses, and assemblies which have successfully performed under tests made by a recognized laboratory in accordance with the requirements of the "Standard Methods of Fire Tests of Building Construction and Materials" (E119-61) of the American Society for Testing and Materials, shall be accepted by the Building Official for specific ratings.

(b) Thicknesses as established by said tests shall be construed as establishing minimum requirements for fire resistance only, and shall not preclude the application of other requirements of this code where consideration of strength, durability or stability require greater thicknesses.

(c) No combustible materials shall enter into the construction of assemblies except as provided in the foregoing prescribed tests.

(d) Fire doors, curtains, shutters, windows, or other protection required for openings in fire resistive walls, shall be in accordance with the requirements of Section 703.

2501.1—MATERIALS FOR FIRE PROTECTION

Materials prescribed herein for fire-resistance and fire protection shall conform with the requirements of this Chapter.

2501.2—CONCRETE

(a) Concrete used for fire-protection shall consist of one part (by volume) portland cement and not more than two parts of sand and four parts of approved aggregate, not over ¾" diameter, reinforced with wire or metal fabric.

(b) Grade A Concrete is concrete in which the coarse aggregate consists of blast-furnace slag, limestone, calcareous gravel, trap rock, burnt clay or shale, cinders containing not more than 25% of combustible material and not more than 5% of volatile material, and other materials meeting the requirements of this Code and containing not more than 30% quartz, chert, flint, and similar materials.

(c) Grade B Concrete is concrete in which the coarse aggregate consists of granite, quartzite, siliceous gravel, sandstone, gneiss, cinders containing more than 25% but not more than 40% of combustible materials and not more than 5% of volatile material, and other materials meeting the requirements of this Code and containing more than 30% quartz, chert, flint, and similar materials.

2501.3—BRICK

Brick shall be laid in Type M, S, N or O mortar. Clay and shale brick shall conform to the American Society for Testing and Materials "Standard Specifications for Building Brick (Solid Masonry Units Made From Clay or Shale)" (ASTM C62-62). Concrete brick shall conform to the American Society for Testing and Materials "Standard Specifications for Concrete Building Brick" (ASTM C55-55). Sand-lime brick shall conform

to the American Society for Testing and Materials "Standard Specifications for Sand-Lime Building Brick" (ASTM C73-51).

2501.4—CLAY OR SHALE TILE

Hollow clay or shale tile shall be laid in Type M, S, N, O or gypsum mortar. Clay or shale tile used in non-bearing partitions, and for fire-proofing shall meet the requirements of the American Society for Testing and Materials "Standard Specifications for Structural Clay Non-Load Bearing Tile" (ASTM C56-62). Clay or shale tile used in exterior walls and in all load-bearing walls or load-bearing partitions, shall comply with the requirements of the American Society for Testing and Materials "Standard Specifications for Structural Clay Load-Bearing Wall Tile" (ASTM C34-62).

2501.5—GYPSUM

(a) Gypsum partition tile blocks shall contain not more than 12½ percent by weight of binding material, shall be laid in gypsum mortar, and shall meet the requirements of the American Society for Testing and Materials "Standard Specifications for Gypsum Partition Tile or Block" (ASTM C52-54).

(b) Poured gypsum used for fire-proofing and floor and roof construction shall contain not more than 12½ percent of wood chips, shavings or fiber, measured in a dry condition, as a percentage, by weight, of the dry mix. Gypsum mortar shall be composed of one part gypsum and not more than three parts clean, sharp, well-graded sand, by weight.

(c) Fibered plaster may be used where unsanded or neat gypsum plaster is prescribed.

(d) All plaster mixes for sanded gypsum plasters shall be measured by dry weight.

(e) When gypsum plaster is used with an aggregate, the proportions shall be as required in Section 1806.2.

2501.6—GYPSUM LATH, GYPSUM WALLBOARD, AND GYPSUM SHEATHING BOARD

(a) Gypsum lath shall comply with the provisions of the American Society for Testing and Materials "Standard Specifications for Gypsum Lath" (ASTM C37-54). Perforated gypsum lath shall have perforations not less than ¾" in diameter, with one perforation for not more than 16 square inches of lath surface.

(b) Gypsum lath shall be nailed to wood studs or joists in all constructions required to be fire-resistive, with No. 13 gage, 1⅛", 19/64" flat-head blued nails at intervals not exceeding 4" on centers, (Five nails per lath for support of 16 inch lath), or equivalent attachment.

(c) Gypsum wallboard shall comply with the provisions of the American Society for Testing and Materials "Standard Specifications for Gypsum Wallboard" (ASTM C36-64).

(d) Gypsum sheathing board shall comply with the provisions of the American Society for Testing and Materials "Standard Specifications for Gypsum Sheathing Board" (ASTM C79-54).

2501.7—METAL OR WIRE LATH

(a) Wherever metal lath or wire lath and plaster are used as required protection against the spread of fire, the weight of lath shall be not less than 2.5 lbs. per square yard when used in vertical position, and not less than 2.75 lbs. per square yard when used in horizontal position. Wire lath shall be not lighter than 2½ meshes per inch, or equivalent.

(b) Weight tags shall be left on all metal lath or wire lath until inspected and approved by the Building Official.

(c) Metal lath for ceilings below wood joists in construction which is required to be fire-resistant shall be attached with 1½", 11 gage, 7/16" head barbed roofing nails spaced at intervals not to exceed 6" on centers, or equivalent attachment.

(d) Whenever the word wire lath is used in fire-resistive plastering it shall not preclude the use of paper back wire lath. Whenever paper back wire lath is used it shall be in accordance with the Requirements for Paper-Backed Wire Fabric as prescribed in Chapter XVIII of this Code.

2501.8—CONCRETE BLOCK

Hollow concrete masonry units used in exterior walls and in all walls or partitions shall comply with the requirements of the American Society for Testing and Materials "Standard Specifications for Hollow Load-Bearing Concrete Masonry Units" (ASTM C90-59 and Non-Load Bearing C129-59).

2501.9—VERMICULITE

Vermiculite, when used as an aggregate with plaster, shall conform in particle size to the American Society for Testing and Materials "Standard Specifications for Inorganic Aggregates for use in Gypsum Plaster" (ASTM C35-62). The weight of vermiculite shall be not less than 6 nor more than 10 lbs. per cu. ft., as determined by measurement in a cubic-foot box, using the shoveling procedure as outlined in the American Society for Testing and Materials "Tentative Method of Test for Unit Weight of Aggregate" (ASTM C29-60).

2501.10—PERLITE

Perlite, when used as an aggregate with plaster, shall conform in particle size to the American Society for Testing and Materials "Standard Specifications for Inorganic Aggregates for use in Gypsum Plaster" (ASTM C35-62). The weight of perlite shall be not less than 7½ nor more than 15 lbs. per cu. ft., as determined by measurement in a cubic-foot box, using the shoveling procedure as outlined in the American Society for Testing and Materials "Tentative Method of Test for Unit Weight of Aggregate" (ASTM C29-60).

SECTION 2502—FIRE RESISTANCE RATINGS FOR MATERIALS AND CONSTRUCTION

2502.1—REFERENCE TABLES

(a) Fire resistance ratings for materials, construction and assemblies of construction materials are shown in Volume I-A of this Code.

(b) The fire resistance ratings as stipulated in Volume I-A are not intended to be all inclusive but rather those which are acceptable as the result of having successfully performed under accepted tests as prescribed in Section 2501. Other fire resistance ratings may be accepted by the Building Official as fire protection on compliance with Section 2501 of this Code, such as Building Materials List of Underwriters Laboratories or test by National Bureau of Standards.

CHAPTER XXVI—USE OF PUBLIC PROPERTY

SECTION 2601—GENERAL

The use of public property or any portion thereof, shall be in accordance with the provisions of this chapter, except signs which shall conform to the requirements of Chapter XXIII, Signs and Outdoor Displays, and allowable use of public property during construction, Section 2401.1.

2601.1—DOORS AND WINDOWS

No door shall open or project upon public property more than 12". Exit doors, as specified in Chapter XI, which are required to open in the direction of exit travel, shall be set back from the property line by means of vestibules or similar enclosures. Windows which swing over public property shall have a clearance of not less than eight feet above the sidewalk or ground level.

2601.2—MARQUEES OR FIXED AWNINGS

(See Section 2605.)

(a) Fixed awnings or marquees shall be entirely of non-combustible construction inside the Fire District.

(b) All combustible materials used in the construction of other awnings or marquees, shall be protected with not less than one hour fire-resistance protection as specified in Volume I-A. All glazing in marquees or fixed awnings shall be of wired glass.

(c) Every fixed awning or marquee shall be at least nine feet in the clear, between the lowest point or projection and a sidewalk immediately below. (See 2305.5—Marquee Signs.)

(d) No fixed awning or marquee shall extend or occupy more than two-thirds (⅔) of the width of sidewalk measured from the building, except that such fixed awning or marquee may occupy the entire width of the sidewalk, provided it is twelve feet in the clear above the sidewalk. The overall height of any marquee, including signs, shall not exceed eight (8) feet, measured from the roof of such marquee.

(e) Marquees constructed with a roof live load of not less than forty (40) pounds per square foot shall be permitted the full width of the building (front) and full depth of the building, corner location.

2601.3—MOVABLE AWNINGS (METAL OR CANVAS)

(a) Metal or canvas awnings may extend over public property for a distance of not more than five (5) feet, provided such awnings or any part thereof maintain a clear height of eight (8) feet above the sidewalk.

(b) All such movable awnings shall be supported on metal frames attached to the building.

2601.4—PROHIBITIVE LOCATIONS

(a) Every awning or marquee shall be so located as not to interfere with the operation of any exterior standpipe, stairway or exit from the building.

(b) Awnings or marquees shall not be used as a landing for any fire escape or exterior stair.

2601.5—CONSTRUCTION REQUIREMENTS

Marquees and awnings shall be so constructed and anchored to the building so as to support all live and dead loads as specified in Chapter XII.

2601.6—ROOF DRAINAGE REQUIRED

The roof of every fixed awning or marquee shall be sloped to down spouts at the building, which shall conduct all drainage under the sidewalk to the curb.

SECTION 2602—OTHER PROJECTIONS

2602.1—GENERAL

(a) Every projection of any character over or upon public property shall maintain a clear height above the sidewalk or ground level of not less than eight feet. The allowable projection over public property shall not exceed the following measurements from the building.

(b) Bay windows, porches, balconies, fire escapes, window air conditioners—three (3) feet.

(c) Cornices, Belt Courses, sills, pilasters, water tables or any decorative features—six (6) inches.

(d) See Section 710 for fire protective requirements.

2602.2—SIDEWALK OR STREET OBSTRUCTIONS

Public property shall be maintained clear of any and all obstructions, including among others, posts, columns, display of wares or merchandise and sidewalk signs, except as permitted by local ordinance.

SECTION 2603—SPACE UNDER PUBLIC PROPERTY

2603.1—SPACE UNDER SIDEWALK

Where space under the sidewalk is used for any purpose a special permit shall be required.

2603.2—SIDEWALK LIGHTS

When glass is set in the sidewalk to provide light for spaces underneath, the glass shall be supported by metal or reinforced concrete frames and such glass shall be not less than one-half (½) inch in thickness. Where such glass is over twelve (12) square inches in area, it shall have wire mesh embedded in the glass. All portions of sidewalk lights shall be of not less strength than required in Section 1203.3 for sidewalks.

SECTION 2604—MOVING OF BUILDINGS

2604.1—GENERAL

No building or part of any building shall be moved through or across any sidewalk, street, alley or highway within the governmental limits without first obtaining a permit from the Building Official and other local authorities having jurisdiction.

2604.2—WRITTEN APPLICATION MUST BE FILED

The Building Official may require a written application setting forth the following information.

(a) Type and kind of building to be moved.

(b) The original cost of such building.

(c) The extreme dimensions of the length, height and width of the building.

(d) Its present location and proposed new location by lot, block, subdivision and street numbers.

(e) The approximate time such building will be upon the streets, and the contemplated route that will be taken from present to new location.

(f) Clearance from other authorities as required. (Such as public utilities, police departments, street department, etc.)

(g) Owners of property which might be affected.

2604.3—BUILDING OFFICIAL SHALL REJECT WHEN

(a) If in the opinion of the Building Official, the moving of any building will cause serious injury to persons or property or serious injury to the streets or other public improvements, or the moving of the building will violate any of the requirements of this Code or of the Zoning Regulations, the permit shall not be issued and the building shall not be moved over the streets. All buildings to be moved must meet requirements of this Code.

(b) Any building being moved for which permit was granted shall not be allowed to remain in or on the streets for more than forty-eight hours.

2604.4—BOND REQUIRED

The Building Official, as a condition precedent to the issuance of such permit, may require a bond to be executed by person desiring such removal permit, with corporate surety to his satisfaction. Such bond shall be made payable to applicable governing body and for such amount as he prescribes. It shall indemnify the applicable governing body against any damage caused by the moving of such building to streets, curbs, sidewalks, shade trees, highways and any other property which may be affected by the moving of a building. Such surety bond shall also be conditioned upon and liable for strict compliance with the terms of said permit, as to route to be taken and limit of time in which to effect such removal and to repair or compensate for the repair and to pay said applicable governing body as liquidated damages an amount not exceeding fifty dollars ($50.00) to be prescribed by the Building Official for each and every day's delay in completing such removal or in repairing any damage to property or public improvement or in clearing all public streets, alleys or highways of all debris occasioned thereby.

2604.5—NOTICES TO BE GIVEN BY BUILDING OFFICIAL

Upon the issuance of said moving permit, the Building Official shall send copy of permit to the Superintendent of Fire Alarm, Chief of Fire Department, telephone or light companies, or others whose property may be affected by such removal. The Building Department shall set forth in all notices the route that will be taken, time started, and approximate time of completion.

2604.6—PUBLIC SAFETY REQUIREMENTS

(a) LIGHTS REQUIRED: Every building which occupies any portion of public property after sundown, shall have sufficient light continuously burning between sunset and sunrise for the protection of the public.

(b) NUMBER AND LOCATION: There shall be a minimum of five red lights placed on each street side of the building; such red lights shall be attached to the building in such a fashion as to indicate extreme width, height, and size.

(c) FLARES REQUIRED: There shall be placed in addition to the red lights on the building, flares at regular intervals for a distance of two hundred feet up the street on each side of the building.

(d) FLAGMEN REQUIRED: When more than fifty percent of the street, measured between curbs, is occupied at night by the building, or when in the opinion of the Building Official, flagmen are necessary to divert or caution traffic, the owner or person moving such building shall employ at their expense, two flagmen, one at each street intersection beyond the building; such flagmen shall remain at these intersections, diverting or cautioning traffic from sunset to sunrise. Red lights shall be employed in flagging traffic at night.

SECTION 2605—ROOFED AREAS OF PUBLICWAYS AND MALLS

(See Section 2601.2 and 2602)

2605.1—GENERAL

All publicways and Malls used by public as a path of travel between buildings, or sections of buildings, shall have a suitable and adequate accessibility for fire department apparatus.

2605.2—ROOFED PUBLICWAYS OR MALLS

(a) When the entire Publicway or Mall is roofed over between groups or sections of buildings, the controlling area limitations shall consist of the sum of all occupied areas connected to the roofed area and not separated therefrom by fire walls, and

(1) Roofs shall be constructed of non-combustible materials.

(2) Automatic smoke ventilation shall be provided in accordance with NFPA 204 with a venting ratio of 1:100 and 120 feet maximum space between vents, unless sprinklered.

(3) When an automatic sprinkler system is required, sprinklers may be omitted in the unoccupied Publicway provided there are no combustible goods, merchandise or decorations to be stored or displayed in this area.

2605.3—PERMANENT AWNINGS OVER PUBLICWAYS OR MALLS

(a) Permanent awnings may extend over sidewalks, parallel to and attached to the fronts of buildings facing on Publicway or Mall where the walls of the buildings and the construction of the permanent awnings, except for the skylights, are non-combustible, provided:

(1) The maximum horizontal width of the permanent awning does not exceed fifteen feet;

(2) The open space between a permanent awning and a building or permanent awning on the opposite side of Publicway or Mall shall be 30 feet or more;

(3) The length of the permanent awning parallel to the building fronts, shall be broken across the entire width by breaks 10 feet or more wide, so spaced that there will be one such break in every 150 feet length of permanent awning. Space formed by breaks may be covered by a skylight containing material easily pierced by fire fighting personnel;

(b) One permanent non-combustible awning detached from buildings, may extend parallel to the fronts of buildings in one length of the Publicway or Mall, provided;

(1) The maximum horizontal width of the permanent awning does not exceed 20 feet;

(2) An open space of 30 feet or more is maintained between the permanent awning and parallel buildings or other permanent awnings;

(c) Permanent non-combustible awnings may cross one length of the Publicway or Mall at intervals of not less than 100 feet, provided:

(1) The maximum horizontal width of the permanent awning does not exceed 30 feet;

(2) Ample clearances are provided under the awnings for passage of fire department apparatus.

CHAPTER XXVII—CHIMNEYS, FIREPLACES AND VENTING SYSTEMS

SECTION 2700—MASONRY CHIMNEYS—GENERAL REQUIREMENTS

2700.1—GENERAL CONSTRUCTION

Masonry chimneys shall be designed and constructed so as to be reasonably safe to persons and property. Conformance of the design and construction of chimneys to the applicable provisions of this code shall be deemed to be reasonably safe to persons and property; on matters not covered by this code, conformance to the applicable standard specified in the Appendix shall be evidence that such masonry chimneys are designed and constructed so as to be reasonably safe to persons and property.

2700.2—SUPPORT

Masonry chimneys shall be supported on foundations of masonry or reinforced concrete or other non-combustible material having a fire resistance rating of not less than 3 hours.

2700.3—CORBELING

No chimney shall be corbeled from a wall more than 6 inches; nor shall a chimney be corbeled from a wall which is less than 12 inches in thickness unless it projects equally on each side of the wall; provided that in the second story of 2-story dwellings, corbeling of chimneys on the exterior of the enclosing walls may equal the wall thickness. Corbeling shall not exceed one inch projection for each course of brick projected.

2700.4—CHANGE IN SIZE OR SHAPE AT ROOF NOT PERMITTED

No change in the size or shape of a chimney, where the chimney passes through the roof, shall be made within a distance of 6 inches above or below the roof joists or rafters.

2700.5—CLEARANCE FROM COMBUSTIBLE MATERIAL

Clearance between chimneys and combustible material shall be not less than specified in Section 1708.

2700.6—SMOKE TEST

Chimneys shall be proved tight by a smoke test after erection and before being put into use.

2700.7—CLEANOUT OPENINGS

Cleanout openings provided in chimneys shall be equipped with ferrous metal doors and frames arranged to remain tightly closed when not in use.

SECTION 2701—MASONRY CHIMNEYS FOR LOW HEAT APPLIANCES

2701.1—GENERAL

Masonry chimneys for low heat appliances shall conform to all the applicable provisions of Section 2700 in addition to those in this Section.

2701.2—APPLIANCES CLASSED AS LOW HEAT APPLIANCES

Low heat appliances shall include ranges, heating stoves, warm air heating furnaces, water heaters and hot water heating boilers, steam boilers operating at not over 50 pounds per square inch gauge pressure, steam boilers of not over 10 boiler horsepower regardless of operating pressure, domestic type incinerators, fireplaces, bakery ovens, candy furnaces, coffee roasting ovens, core ovens, lead melting furnaces, rendering furnaces, stereotype furnaces, wood drying furnaces, and other furnaces classified as low heat appliances in accordance with the provisions of section 2700.1. Appliances otherwise classed as medium heat appliances may be considered as low heat appliances if not larger than 100 cubic feet in size.

2701.3—CONSTRUCTION

(a) Masonry chimneys for low heat appliances shall be constructed of rubble stone masonry 12 inches thick or solid masonry units or reinforced concrete of the following thicknesses:

(1) Chimney walls shall be not less than 4 inches thick in dwellings, when connected to domestic type low heat appliances and for building heat equipment for heating a total volume of occupied space not to exceed 25,000 cubic feet;

(2) Except that other chimney walls shall be not less than 8 inches thick.

(b) Masonry chimneys for low heat appliances shall be lined with approved fire clay flue liners not less than ⅝ of an inch thick, or with other approved liner of material that will resist without softening or cracking at temperature of 1800° F.

(c) Fire clay flue liners shall be installed ahead of the construction of the chimney as it is carried up, carefully bedded one on the other in Type M, Type S or fire clay mortar with close fitting joints left smooth on the inside.

(d) In masonry chimneys with walls less than 8 inches thick, liners shall be separate from the chimney wall and the space between the liner and masonry shall not be filled; only enough mortar shall be used to make a good joint and hold the liners in position.

(e) Flue liners shall start from a point not less than 8 inches below the intake, or, in the case of fireplaces, from the throat of the fireplace. They shall extend, as nearly vertically as possible, for the entire height of the chimney.

(f) Where two flues adjoin each other in the same chimney with only flue lining separation between them, the joints of the adjacent flue linings shall be staggered at least 7 inches.

(g) Where more than two flues are located in the same chimney, masonry wythes at least 4 inches wide and bonded into the masonry walls of the chimney shall be built at such points between adjacent flue linings that there are not more than two flues in any group of adjoining flues without such wythe separation.

2701.4—HEIGHT

(a) Masonry chimneys for low heat appliances shall extend at least 3 feet above the highest point where they pass through the roof of a building and at least 2 feet higher than any portion of the building within 10 feet.

SECTION 2702—MASONRY CHIMNEYS FOR MEDIUM HEAT APPLIANCES

2702.1—GENERAL

Masonry chimneys for medium heat appliances shall conform to all the applicable provisions of Section 2700 in addition to those in this Section 2702.

2702.2—APPLIANCES CLASSED AS MEDIUM HEAT APPLIANCES

Medium heat appliances shall include annealing furnaces (glass or metal), charcoal furnaces, galvanizing furnaces, gas producers and steam boilers of over 10 boiler horsepower operating at over 50 pounds per square inch gauge pressure when such appliances are larger than 100 cubic feet in size, and other furnaces classified as medium heat appliances in accordance with the provisions of Section 2701.1. Appliances otherwise classed as high heat appliances may be considered as medium heat appliances if not larger than 100 cubic feet in size.

2702.3—CONSTRUCTION

Masonry chimneys for medium heat appliances shall be constructed of solid masonry units or of reinforced concrete not less than 8 inches thick, except that stone masonry shall be not less than 12 inches thick; and in addition, shall be lined with not less than 4½ inches of fire brick laid on the 4½-inch bed in fire clay mortar, starting not less than 2 feet below the chimney connector entrance and extending for a distance of at least 25 feet above the chimney connector entrance.

2702.4—HEIGHT

Masonry chimneys for medium heat appliances shall extend not less than 10 feet higher than any portion of any building within 25 feet.

SECTION 2703—MASONRY CHIMNEYS FOR HIGH HEAT APPLIANCES

2703.1—GENERAL

Masonry chimneys for high heat appliances shall conform to all the applicable provisions of Section 2700 in addition to those in this Section 2703.

2703.2—APPLIANCES CLASSED AS HIGH HEAT APPLIANCES

High heat appliances shall include billet and bloom furnaces, blast furnaces, brass melters, cupolas, glass furnaces, open hearth furnaces, ceramic and vitreous enameling ovens when such appliances are larger than 100 cubic feet in size, and other furnaces classified as high heat appliances in accordance with the provisions of Section 2700.1.

2703.3—CONSTRUCTION

Masonry chimneys for high heat appliances shall be constructed with double walls of solid masonry units or of reinforced concrete, each not less than 8 inches in thickness, with an air space of not less than 2 inches between them. The inside of the interior walls shall be of fire brick not less than 4½ inches in thickness laid on the 4½-inch bed in fire clay mortar.

2703.4—HEIGHT

Masonry chimneys for high heat appliances shall extend not less than 20 feet higher than any portion of any building within 50 feet.

2703.5—CLEARANCE FROM COMBUSTIBLE MATERIAL

Masonry chimneys for high heat appliances shall have sufficient clearance from buildings and structures to avoid overheating combustible material, to permit inspection and for maintenance operations on the chimney. Clearances shall be based on good engineering practice and subject to approval by the Building Official.

SECTION 2704—MASONRY CHIMNEYS FOR INCINERATORS

2704.1—DOMESTIC TYPE INCINERATORS

Masonry chimneys for domestic type incinerators shall be constructed in accordance with the requirements for masonry chimneys for low heat appliances, Section 2701.

2704.2

(a) CONSTRUCTION

(1) The flue of flue-fed incinerators shall serve the incinerator only and be used for no other purpose.

(2) The flue liner shall be straight and plumb and shall be smooth on the inside.

(3) The size of incinerator flues shall be in accordance with the following:

(a) Where not more than one service opening is provided, the size of flue shall be not less than 14 by 14 inches or 196 square inches, inside measurements, except that in one family dwellings the size shall be not less than 12 by 12 or 144 square inches.

(b) Where two to six service openings are provided, the size of flue shall be not less than 18 by 18 inches or 324 square inches, inside measurements.

(c) Where seven or more service openings are provided, the size of flue shall be not less than 22 by 22 inches or 484 square inches, inside measurements.

(4) A chimney serving an incinerator with a combustion chamber having a horizontal combined hearth and grate area of 7 square feet or less shall have walls of clay or shale brickwork not less than 4 inches thick with a lining of 4½ inches of fire brick for a distance of not less than 10 feet above the roof of the combustion chamber; beyond this point chimney walls shall consist of not less than 8 inches of

clay or shale brickwork with a standard fire clay liner not less than ⅝ inch in thickness extending from the top of the fire brick lining to the top of the chimney.

(5) A chimney serving an incinerator with a combustion chamber having a horizontal combined hearth and grate area exceeding 7 square feet shall have walls of clay or shale brickwork not less than 4 inches thick with a lining of 4½ inches of fire brick for a distance of not less than 40 feet above the roof of the combustion chamber; beyond this point, chimney walls shall consist of not less than 8 inches of clay or shale brickwork with a standard fire clay flue liner extending from the top of the fire brick lining to the top of the chimney.

(6) Other constructions may be used if equivalent to the constructions outlined in Section 2704.2(a), 4 and 5, in structural strength, insulating value and ability to withstand thermal expansion and flame impingement.

(7) Fire brick shall be laid in high temperature cement or fire clay mortar.

(8) A flue that is divided into two channels, one for feeding refuse and the other for the discharge of combustion gases, shall be constructed as specified in this subsection 2705.2.

(9) Masonry chimneys for flue-fed incinerators shall be supported on properly designed foundations of masonry or reinforced concrete. Non-combustible material having a fire resistance rating of not less than 3 hours may be used to support masonry chimneys where such supports are independent of the floor construction and the load is transferred to the ground. They shall be so constructed as not to place excessive stress upon the roof of the combustion chamber. Masonry chimneys may be supported on incinerator walls.

(10) All flues shall terminate in a substantially constructed spark arrester with openings not greater than ½ inch, or be provided with other suitable means for avoiding discharge of fly particles. Expansion chambers used as a secondary combustion chamber shall be constructed equivalent to that of the incinerator combustion chamber. Those used only for settling shall be of construction equivalent to that of the upper portion of incinerator chimney and with clearances to combustible construction as specified by Section 1708. Expansion chambers shall be provided with substantial non-combustible supports. Every expansion chamber shall have a vent of cross-sectional area at least equal to that of the flue.

(b) HEIGHT: Chimneys of flue-fed incinerators shall extend at least 4 feet above sloping roofs measured from the highest point at which the chimney passes through the roof and at least 8 feet above flat roofs. In either case, the chimney shall extend at least 2 feet higher than any portion of a building within 2 feet.

2704.3—COMMERCIAL AND INDUSTRIAL TYPE INCINERATORS

(a) CONSTRUCTION

(1) Chimneys of commercial and industrial type incinerators, except as provided in Section 2704.3(a) (2) and (3), shall be not less than

8 inches of clay or shale brickwork or reinforced concrete or a metal chimney, lined with fire brick not less than 4½ inches thick for the full height of the chimney.

(2) Subject to approval by the Building Official, commercial and industrial type incinerators may be connected to chimneys constructed of 8 inches of clay or shale brickwork or reinforced concrete lined with fire clay flue liner, or to a metal chimney, where the incinerator is specially constructed to produce low flue gas temperatures.

(3) Other constructions may be used if equivalent to the construction outlined in Section 2704.3(a) (1) and (2) in structural strength, insulating value and ability to withstand thermal expansion and flame impingement.

(4) Fire brick and other refractory lining shall be laid in high temperature cement or fire clay mortar.

(5) Masonry chimneys for commercial and industrial incinerators shall be supported on properly designed foundations of masonry or reinforced concrete. Non-combustible material having a fire resistance rating of not less than 3 hours may be used to support masonry chimneys where such supports are independent of the floor construction and the load is transferred to the ground. They shall be so constructed as not to place excessive stress upon the roof of the combustion chamber. Masonry chimneys may be supported on incinerator walls.

(6) Incinerators may be connected to industrial or similar chimneys serving heat-producing appliances provided the cross-sectional area of such chimney is adequate for the combined services and its construction is suitable for the chimney flue gas temperature.

(7) Incinerators used for the burning of rubbish or other readily combustible solid waste material shall include effective means for arresting sparks and fly particles, such as an expansion chamber, baffle walls, or other effective arrangement, or the flues of such incinerators shall be provided with an approved spark arrester having openings not greater than ¾ inch.

(b) HEIGHT: Chimneys of commercial and industrial type incinerators shall extend at least 4 feet above sloping roofs measured from the highest point at which the chimney passes through the roof and at least 8 feet above flat roofs. In either case, the chimney shall extend at least 2 feet higher than any portion of a building within 20 feet.

SECTION 2705—LABORATORY TESTED FACTORY-BUILT CHIMNEYS

Factory-built chimneys that are approved as a result of tests and listing by a nationally recognized testing laboratory shall be installed in accordance with the conditions of the approval.

SECTION 2706—METAL CHIMNEYS (SMOKESTACKS)

2706.1—GENERAL REQUIREMENTS

(a) Metal chimneys shall be of adequate thickness based on good engineering practice, properly riveted or welded, and securely supported.

(b) Metal chimneys shall not be carried up inside of ventilating ducts unless such ducts are constructed and installed as required by this standard for chimneys and the ventilating ducts are used solely for exhaust of air from the room or space in which the appliance served by the metal chimney is located.

(c) Metal chimneys shall have sufficient clearance from buildings and structures to avoid overheating combustible material, to permit inspection and maintenance operations on the chimney, and to avoid danger of burns to persons using any nearby exitway.

2706.2—METAL CHIMNEYS FOR LOW HEAT APPLIANCES

(a) HEIGHT

(1) Metal chimneys for low heat appliances except as provided in Section 2706.2(a) 2, shall extend at least 3 feet above the highest point where they pass through the roof of a building and at least 2 feet higher than any portion of a building within 10 feet.

(2) The outlet of a metal chimney for residential and low-heat appliances equipped with an exhauster may terminate at a location not less than 3 feet from an adjacent building or building opening and at least 10 feet above grade or walkways. In any case, the outlet shall be so arranged that the flue gases are not directed so as to jeopardize people, overheat combustible structures, or enter building openings in the vicinity of the outlet.

(b) CLEARANCES FOR EXTERIOR METAL CHIMNEYS

(1) Exterior metal chimneys used only for low heat appliances as defined in Section 2701.2 shall have a clearance of not less than 6 inches from a wall of wood frame construction and from any combustible material.

(2) Exterior metal chimneys over 18 inches in diameter shall have a clearance of not less than 4 inches, and those 18 inches or less in diameter a clearance of not less than 2 inches from non-combustible material and a building wall of other than wood frame construction.

(3) No portion of an exterior metal chimney shall be nearer than 24 inches to any door or window or to any walk way, unless insulated or shielded in an approved manner to avoid burning a person who might touch the chimney.

(c) CLEARANCES FOR INTERIOR METAL CHIMNEYS

(1) Where a metal chimney extends through any story above that in which the appliances connected to the chimney are located, it shall be enclosed in such upper stories with walls of non-combustible construction having a fire resistance rating of not less than one hour.

(2) The enclosure shall provide a space on all sides of the chimney sufficient to permit inspection and repair.

(3) The enclosing walls shall be without openings, except doorways equipped with approved self-closing fire doors at various floor levels for inspection purposes.

(4) Where a metal chimney used for low heat appliances as defined in Section 2701.2 is located in the same story of a building as that in which the appliances connected thereto are located, it shall have a

clearance of not less than 18 inches from a wall of wood frame construction and from any combustible material except as provided in Section 2708.5(b) for metal pipe gas vents.

(5) Where a metal chimney serving only low heat appliances as defined in Section 2701.2 passes through a roof constructed of combustible material, it shall be guarded by a ventilating thimble of galvanized iron or approved corrosion resistant metal, extending not less than 9 inches below and 9 inches above the roof construction, and of a size to provide not less than 6 inches clearance on all sides of the chimney; or the combustible material in the roof construction shall be cut away so as to provide not less than 18 inches clearance on all sides of the chimney, with any material used to close up such opening entirely non-combustible.

2706.3—METAL CHIMNEYS FOR MEDIUM HEAT APPLIANCES

(a) HEIGHT: Metal chimneys for medium heat appliances shall extend not less than 10 feet higher than any portion of any building within 25 feet.

(b) CLEARANCES FOR EXTERIOR METAL CHIMNEYS

(1) Exterior metal chimneys used for medium heat appliances as defined in Section 2702.2 shall have a clearance of not less than 24 inches from a wall of wood frame construction and from any combustible material.

(2) Exterior metal chimneys over 18 inches in diameter shall have a clearance of not less than 4 inches, and those 18 inches or less in diameter a clearance of not less than 2 inches from non-combustible material and a building wall of other than wood frame construction.

(3) No portion of an exterior metal chimney shall be nearer than 24 inches to any door or window or to any walkway, unless insulated or shielded in an approved manner to avoid burning a person who might touch the chimney.

(c) CLEARANCES FOR INTERIOR METAL CHIMNEYS

(1) Where a metal chimney extends through any story of a building above that in which the appliances connected to the chimney are located, it shall be enclosed in such upper stories with walls which are continuous of non-combustible construction having a fire resistance rating of not less than one hour.

(2) The enclosure shall provide a space on all sides of the chimney sufficient to permit inspection and repair.

(3) The enclosed walls shall be without openings, except doorways equipped with approved self-closing fire doors at various floor levels for inspection purposes.

(4) Where a metal chimney serving a medium heat appliance as defined in Section 2702.2 passes through a roof constructed of combustible material, it shall be guarded by a ventilating thimble of galvanized iron or approved corrosion resistant metal, extending not less than 9 inches below and 9 inches above the roof construction, and of a size to provide not less than 18 inches clearance on all sides of the chimney.

(5) Where a metal chimney used for medium heat appliances as defined in Section 2702.2 is located in the same story of a building as that in which the appliances connected are located, it shall have a clearance of not less than 36 inches from a wall of wood construction and from any combustible material.

2706.4—METAL CHIMNEYS FOR HIGH HEAT APPLIANCES

(a) CONSTRUCTION: Metal chimneys used for high heat appliances as defined in Section 2703.2 shall be lined with not less than 4½ inches of fire brick laid in fire clay mortar extending not less than 25 feet above the chimney connector entrance.

(b) HEIGHT: Metal chimneys for high heat appliances shall extend not less than 20 feet higher than any portion of any building within 50 feet.

(c) CLEARANCE FROM COMBUSTIBLE MATERIAL: Metal chimneys for high heat appliances shall have sufficient clearance from buildings and structures to avoid overheating combustible material, to permit inspection, maintenance operations on the chimney and to avoid danger of burns to persons using any nearby exit way. Clearances shall be based on good engineering practice and subject to the approval by the Building Official.

SECTION 2707—METAL CHIMNEYS FOR INCINERATORS

Metal chimneys not less than No. 20 galvanized sheet gage number or other equivalent non-combustible corrosion resistant material may be used for domestic type incinerators installed in locations such as sheds, breezeways or carports provided the metal chimney is exposed and readily examinable for its full length and clearances not less than 18 inches are maintained from combustible material. The metal chimney shall extend at least 3 feet above the highest point where it passes through the roof and at least 2 feet higher than any portion of the building within 10 feet. Where the metal chimney passes through a roof constructed of combustible material, clearances shall conform to the requirements for interior metal chimneys for low heat appliances, Section 2706(c) 6.

2707.1—COMMERCIAL AND INDUSTRIAL TYPE INCINERATORS

(a) CONSTRUCTION

(1) Metal chimneys of commercial and industrial type incinerators, shall be lined with fire brick not less than 4½ inches thick for the full height of the chimney.

(2) Firebrick shall be laid in high temperature cement or fire clay mortar.

(3) Subject to approval by the Building Official commercial and industrial type incinerators may be connected to a metal chimney without firebrick flue liner provided the incinerator is specially constructed to produce low flue gas temperatures.

(b) HEIGHT: Metal chimneys of commercial and industrial type incinerators shall extend at least 4 feet above sloping roofs measured from the highest point at which the metal chimney passes through the roof and at least 8 feet above flat roofs. In either case, the chimney shall extend at least 2 feet higher than any portion of a building within 20 feet.

(c) CLEARANCE: A clearance of not less than 4 inches shall be provided between the exterior surface of metal chimneys for commercial and industrial type incinerators and combustible material.

SECTION 2708—VENTS AND VENTING SYSTEMS

2708.1—TYPES OF VENTS WHICH MAY BE USED

(a) Appliance vents that do not conform to the requirements of this article for chimneys shall be one of the following types installed as required by this section.

(1) TYPE B GAS VENTS—Factory made vent piping of non-combustible, corrosion resistant material approved as a result of tests and listings by a nationally recognized testing laboratory for venting of approved gas appliances equipped to burn only gas.

(2) TYPE BW GAS VENTS—Factory made vent piping of non-combustible, corrosion resistant material approved as a result of tests and listing by a nationally recognized testing laboratory for venting approved gas-fired wall furnaces.

(3) TYPE L VENTING SYSTEMS—Factory made vent piping and fittings of non-combustible material approved as a result of tests and listing by a nationally recognized testing laboratory for use with fuel burning appliances approved for use with such systems.

(4) METAL PIPE GAS VENTS—Vent piping of sheet copper of not less than No. 24 B & S gauge or of galvanized iron of not less than No. 20 galvanized sheet gauge or of other approved non-combustible corrosion resistant material.

2708.2—USE LIMITS

(a) Type B vents shall be used only with approved gas appliances which produce flue gas temperatures not in excess of 550°F. They shall not be used for venting:

(1) Incinerators.

(2) Appliances which may be converted readily to the use of solid or liquid fuels.

(3) Combination gas oil burning appliances.

(4) Appliances approved for use with chimneys only.

(b) Type BW vents shall be used only with approved vented gas fired wall furnaces having a capacity not greater than that of the listed Type BW gas vent.

(c) Type L venting systems shall be used only with appliances specifically approved for such use and approved gas appliances suitable for use with Type B gas vents.

(d) Metal pipe gas vents may be used in accordance with the following to vent gas appliances that have been tested by an approved agency and found to have flue gas temperatures not exceeding 550° F.

(1) Metal pipe gas vents shall be used only for runs directly from the space in which the appliance is located through the roof or exterior wall to the the outer air.

(2) Metal pipe gas vents shall not originate in any unoccupied attic or concealed space and shall not pass through any attic, inside wall, concealed space nor through any floor or ceiling.

2708.3—HEIGHT

(a) Except as provided in 2708.3(d) and in 2708.6, all vents and venting systems shall terminate above the roof surface, and:

(1) Vents and venting systems except as provided in Section 2708.3(a) (2) shall extend 2 feet above the highest point where they pass through the roof surface of a building and at least 2 feet higher than any portion of a building within 10 feet.

(2) Vents and venting systems installed with approved mechanical exhausters may terminate at a height of not less than 12 inches above the highest point where they pass through the roof surface.

(b) Natural-draft vents for gas appliances shall terminate at a height not less than 5 feet above the highest connected appliance outlet except as provided in 2708.6(b).

(c) Gas vents serving vented wall furnaces shall terminate at a height not less than 12 feet above the bottom of the furnace.

(d) Powered vents and venting systems need not comply with 2708.3(a), (b) and (c) provided they comply with the following:

(1) Approval shall be obtained from the Building Official.

(2) The outlet of an exhauster-equipped gas-venting system serving approved gas appliances equipped with draft hoods shall be not less than 9 inches from any building opening nor less than 2 feet from an adjacent building; and not less than 7 feet above grade or walkways.

(3) The outlet of an exhauster-equipped Type L venting system serving oil fuel fired appliances approved for use with such venting systems shall be not less than 1 foot from any building opening nor less than 2 feet from an adjacent building; and not less than 7 feet above grade or walkways.

(4) The outlet shall be so arranged that flue gases are not directed so as to jeopardize people, overheat combustible structures or enter building openings in the vicinity of the outlet.

2708.4—MARKING OF GAS VENTS

Gas vents which are not suitable for use with solid or liquid fuel burning appliances shall be plainly and permanently labeled:

"This flue is for appliances which burn gas only, do not connect to incinerators or solid or liquid fuel burning appliances," unless permission to omit this marking is granted by the Building Official.

2708.5—INSTALLATION

(a) Type B and type BW gas vents and type L venting systems shall be installed in full compliance with the terms of their approval.

(b) Metal pipe vents shall be installed with minimum clearances from combustible material as follows:

(1) Appliances without draft hoods, 18 inches;

(2) Appliances equipped with draft hoods, 9 inches;

(3) Approved appliances with draft hoods except incinerators, 6 inches;

(4) Boilers and furnaces equipped with approved conversion burners and with draft hoods, 9 inches.

(c) Where a metal pipe vent passes through an exterior wall constructed of combustible material, except as provided in Section 2708.5(c) (4), it shall be guarded at the point of passage by a ventilating metal thimble not smaller than the following:

(1) For gas burning appliances that have not been found by test by an approved agency to have flue gas temperatures of 550° F. or less—6 inches larger in diameter than the vent pipe;

(2) For gas burning appliances, with draft hoods, except incinerators, and approved as a result of tests and listing by a nationally recognized testing laboratory—4 inches larger in diameter than the vent pipe, unless there is a run of not less than 6 feet of vent pipe in the open, between the draft hood outlet and the thimble, in which case the thimble may be 2 inches larger in diameter than the vent pipe;

(3) For incinerators and appliances without draft hoods—12 inches larger in diameter than the vent pipe.

(4) In lieu of thimble protection all combustible material in the wall shall be cut away from the vent pipe a sufficient distance to provide the clearance required by Section 2708.5(b) from such vent pipe to combustible material, with any material used to close up such opening entirely non-combustible.

(d) Where a metal pipe vent passes through a roof constructed of combustible material it shall be guarded at the point of passage as specified for passage through a combustible exterior wall by Section 2708.5(c) or by a non-combustible non-ventilating thimble not less than 4 inches larger in diameter than the vent pipe and extending not less than 18 inches above and 6 inches below the roof with the annular space open at the bottom and closed only at the top.

2708.6—SPECIAL VENTING ARRANGEMENTS

(a) APPLIANCES WITH SEALED COMBUSTION CHAMBERS: Venting arrangements for appliances with sealed combustion chambers with integral venting systems need not comply with this article when such appliances are installed in accordance with the conditions of their approval.

(b) VENTILATING HOODS AND EXHAUST SYSTEMS

(1) Ventilating hoods and exhaust systems serving commercial cooking appliances may be used to vent gas-burning appliances installed in commercial applications. The connector from the appliance shall terminate under the hood 18 inches from any grease filter or screen installed in the hood.

(2) When automatically operated appliances, such as water heaters, are vented through natural-draft ventilating hoods, dampers other than fire dampers shall not be installed in the exhaust system. When the ventilating hood or exhaust system is equipped with power means of exhaust, the appliance control system shall be so interlocked as to permit appliance operation only when the power means of exhaust is in operation.

SECTION 2709—FIREPLACES

2709.1—FACTORY-BUILT FIREPLACES

Factory-built fireplaces shall be approved as a result of tests and listing by a nationally recognized testing laboratory and shall be installed in accordance with the conditions of the approval. Hearth extensions shall be provided in accordance with Section 2709.3(f).

2709.2—FACTORY-BUILT FIREPLACE STOVES

Factory-built fireplace stoves shall be approved as a result of tests and listing by a nationally recognized testing laboratory and shall be installed in accordance with the conditions of the approval. Hearth extensions shall be provided in accordance with section 2709.3(d).

2709.3—MASONRY FIREPLACES

(a) Fireplaces shall be constructed of solid masonry or of reinforced concrete with back and sides of the thickness specified in this paragraph, except as provided in 2701. Where a lining of firebrick at least 2 inches thick or other approved lining is provided, the total thickness of back and sides, including the lining, shall be not less than 8 inches. Where no such lining is provided, the thickness of back and sides shall be not less than 12 inches.

(b) Steel fireplace units incorporating a firebox liner of not less than ¼-inch thick steel 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, not less than 4 inches of which shall be solid masonry.

(c) Warm air ducts employed with steel fireplace units of the circulating air type shall be constructed of metal or masonry.

(d) Fireplace hearth extensions shall be provided of approved noncombustible materials for all fireplaces. Where the fireplace opening is less than 6 sq. ft., the hearth extension shall extend at least 16 in. in front of, and at least 8 in. beyond each side of the fireplace opening. Where the fireplace opening is 6 sq. ft. or larger, the hearth extension shall extend at least 20 in. in front of, and at least 12 in. beyond each side of the fireplace opening. Where a fireplace is elevated above or overhangs a floor, the hearth extension shall also extend over the area under the fireplace.

(e) Fireplaces constructed of masonry or reinforced concrete shall have hearth extensions of brick, concrete, stone, tile or other approved noncombustible material properly supported and with no combustible material against the underside thereof. Wooden forms or centers used during the construction of hearth and hearth extension shall be removed when the construction is completed.

(f) Hearth extensions of approved factory built fireplaces and fireplace stoves shall be not less than ⅜ in. thick of asbestos, concrete, hollow metal, stone, tile or other approved non-combustible material. Such hearth extensions may be placed on the slab or finished flooring whether the flooring is combustible or not. The hearth extension shall be readily distinguishable from the surrounding floor.

(g) Clearances between fireplaces of masonry or reinforced concrete and combustible material shall be not less than specified in Section 1708.

(h) Spaces between fireplaces and combustible material shall be firestopped as specified in Section 1708.

BUILDING SERVICES EQUIPMENT

(Chapters XXVIII-XXXI)

CHAPTER XXVIII—PLUMBING

CHAPTER XXIX—HEAT PRODUCING APPLIANCES, HEATING, VENTILATING AIR CONDITIONING, BLOWER AND EXHAUST SYSTEMS

SECTION 2900—Installation Standards
2901—Boiler and Furnace Rooms

CHAPTER XXX—ELECTRICAL INSTALLATIONS

CHAPTER XXXI—ELEVATORS AND ESCALATORS

CHAPTER XXVIII—PLUMBING

The design and installation of plumbing systems, including sanitary and storm drainage, sanitary facilities, and storm water shall comply with the requirements as outlined in Volume II of this Code. Water supplies and sewage are regulated by the N. C. State Board of Health and Local Boards of Health.

NORTH CAROLINA STATE BUILDING CODE

Volume II

PLUMBING

(Available from Engineering Division, N. C. Department of Insurance, Box 351, Raleigh, N. C., price —$1.00 plus 3¢ tax.)

CHAPTER XXIX—HEAT PRODUCING APPLIANCES, HEATING, VENTILATING, AIR CONDITIONING, BLOWER AND EXHAUST SYSTEMS

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 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 31-65
Spray Finishing	NFPA 33-66
Gas Appliances and Gas Piping, Installation of	NFPA 54-64
Air Conditioning and Ventilating (Non-Residential)	NFPA 90A-66
Warm Air Heating and Air Conditioning, Residence Type	NFPA 90B-65
Blower and Exhaust Systems	NFPA 91-61
Restaurant Cooking Equipment, Ventilation	NFPA 96-64
Smoke and Heat Venting Guide	NFPA 204-61

SECTION 2901—FURNACE AND BOILER ROOM

(a) Every Central Heating Boiler and/or Furnace 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 and/or Furnace 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) An A.G.A. approved enclosed furnace incorporating an integral total enclosure and using only *outside air* for combustion may be installed in classrooms of schools under the following conditions:

(1) One story buildings with class rooms above grade.

(2) They may be installed only on outside walls or above roof, with all gas piping to be exposed (if above ground) on outside of building and protected from mechanical injury.

(3) The vent shall extend above the roof.

(4) 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.

(5) The installation shall be in accordance with conditions of Label and NFPA-54.