

# **BUILDING SPECIFICATIONS FOR HEALTH/LIFE SAFETY IN PUBLIC SCHOOLS (23 Ill. Adm. Code 185)**

This is the maintenance code for school facilities  
Before July 1, 1965

Illinois State Board of Education  
School Construction and Facility Services  
100 North First Street  
Springfield, Illinois 62777-0001  
Telephone: 217/785-8779  
Fax: 217/782-6096  
ISBE Web Site: <http://www.isbe.net>  
School Construction Web Site: <http://www.isbe.net/construction>

## STATE BOARD OF EDUCATION

## NOTICE OF CODIFICATION WITH NO SUBSTANTIVE CHANGES

Heading of Part and Code Citation.Building Specifications for Health and Safety in  
Public Schools (23 Ill. Adm. Code 185)Conversion Table of Present and Codified Rules:

(Note: Tables Depicting Various Construction Data are located at the end of the text)

## Current System

## 23 Ill. Adm. Code 185

Article I	Subpart A	Authority, Administration and Enforcement
100.00	185.05	Title & Effective Date
101.00	185.10	Identification of Titles
102.00	185.20	Authority & Jurisdiction
103.00	185.30	Purpose and Scope
104.00	185.40	Partial Invalidity
105.00	185.50	School Boards
106.00	185.60	Enforcing Authority
107.00	185.70	State Superintendent
108.00	185.80	Advisory Board for School Safety
109.00	185.90	Plans and Specifications
110.00	185.95	Safety Survey Reports
Article II	Subpart B	Interpretations, Abbreviations, Definitions, and Accepted Standards
200.00	185.200	Interpretations
201.00	185.210	Abbreviations
202.00	185.220	Definitions
203.00.	185.230	Nationally Recognized Testing Laboratories
Article III	Subpart C	Safety Against Fire
Chapter 1	185.310	General Provisions
Chapter 2	185.320	Plan A Buildings - Single Story
Chapter 3	185.330	Plan B Buildings - Multi Story with Direct Exterior Exiting
Chapter 4	185.340	Plan C Buildings - Multi Story with Enclosed Interior
Chapter 5	185.350	Plan D. Buildings - Multi Story with Open Interior
Chapter 6	185.360	Specific Requirements - Assembly Occupancies
Chapter 7	185.370	Exit Requirements & Details
Chapter 8	185.380	Interior Travel to Exits
Chapter 9	185.390	Construction Requirements & Physical Safeguards
Chapter 10	185.395	Sprinkler Protection, Detection & Alarm Systems

Article IV	Subpart D	Heating, Ventilating & Incinerators
400.00	185.400	Scope
401.00	185.405	Heating Capacities
402.00	185.410	Methods of Heating
403.00	185.415	Unit Ventilators & Unit Heaters Space Heaters
404.00	185.420	Space Heaters
405.00	185.425	Furnaces & Safety Controls
406.00	185.430	Boiler and Safety Controls
407.00	185.435	Fuel Burners, Fuel Burning Installations & Heating Installations
408.00	185.440	Fuel Burners & Other Heat Sources
409.00	185.445	Flue Pipes, Vent Pipes. Smoke Pipes & Draft Controls
410.00	185.450	Combustion Air Supply.
411.00	185.455	Type of Ventilating Systems
412.00	185.457	Outdoor Air Required
413.00	185.460	Exhaust Systems Required
414.00	185.465	Ducts, Fire Dampers & Filters
415.00	185.470	Operation of Ventilating Systems
416.00	185.475	Stopping of Ventilating Equipment
417.00	185.480	Incinerators
418.00	185.485	Gas Piping
419.00	185.488	Kilns
420.00	185.490	Steam Pressure Reducing Valves
421.00	185.495	High Pressure Boilers & Safety Controls
422.00	185.497	Roof Top or Roof Mounted Heating, Cooling, Heating - Cooling Air Supply Units
Article V	Subpart E	Electrical Systems
500.00	185.500	Scope
501.00	185.510	General Requirements
502.00	185.520	Branch Circuits
503.00	185.530	Feeders
504.00	185.540	Overcurrent Protection
505.00	185-550	Wiring Methods
506.00	(Deleted in Codification)	
507.00	185.560	Exit Lighting
508.00	185.570	Emergency Lighting
509.00	185.580	Fire Alarm Systems
510.00.	185.590	Fire Detection Systems
511.00	185.595	Minimum Levels of Illumination
Article VI	Subpart F	Water Supply
600.00	185.600	Scope
601.00	185.610	General Requirements
602.00	185.620	Quality of Water Supply
603.00	185.630	Water Delivery Pressures & Quantities

Article VII	Subpart G	Toilets, Plumbing & Sewage Disposal
700.00	185.700	Scope
701.00	185.710	Plumbing & Sewage Disposal Requirements
702.00	185.720	Domestic Water Heaters - with Fuel Burners
703.00	185.730	Domestic Water Heaters - Water, Steam or Electric Heated
704.00	185.740	Maximum Water Temperatures
Article VIII	Subpart H	Seating
800.00	185.800	Scope
801.00	185.810	Assembly Occupancy Seating (Other than Bleachers)
802.00	185.820	Educational & Special Educational Occupancy Seating (Other than Bleachers)
803.00	185.830	Bleachers
	Appendix A	Tables Depicting Various Construction Data
	Table A	Maximum Fire Area
	Table B	Maximum Height
	Table C	Maximum Fire Area (Sq. Ft.)
	Table D	Maximum Height
	Table E	Maximum Fire Area (Sq. Ft.)
	Table F	Maximum Height
	Table G	Maximum Fire (Sq. Ft.)
	Table H	Dimensional & Definitive Limitations of Class A, B & C Exit Stairs
	Table I	Dimensional & Definitive Limitations I of Class A, B & C Ramps
	Table J	Dimensional & Definitive Limitations of Class A, B & C Fire Escapes
	Table K	Flame Spread Limitations

TITLE 23: EDUCATION AND CULTURAL RESOURCES  
SUBTITLE A: EDUCATION  
CHAPTER I: STATE BOARD OF EDUCATION  
SUBCHAPTER d: CONSTRUCTION AND BUILDING MAINTENANCE  
PART 185  
BUILDING SPECIFICATIONS FOR HEALTH  
AND SAFETY IN PUBLIC SCHOOLS

SUBPART A: AUTHORITY, ADMINISTRATION AND ENFORCEMENT

Section	
185.05	Title and Effective Date
185.10	Identification of Titles
185.20	Authority and Jurisdiction
185.30	Purpose and Scope
185.40	Partial Invalidity
185.50	School Boards
185.60	Enforcing Authority
185.70	State Superintendent
185.80	Advisory Board for School Safety
185.90	Plans and Specifications
185.95	Safety Survey Reports

SUBPART B: INTERPRETATIONS, ABBREVIATIONS,  
DEFINITIONS AND ACCEPTED STANDARDS

Section	
185.200	Interpretations
185.210	Abbreviations
185.220	Definitions
185.230	Nationally Recognized Testing Laboratories

SUBPART C: SAFETY AGAINST FIRE

Section	
185.310	General Provisions
185.320	Plan A Buildings - Single Story
185.330	Plan 8 Buildings - Multi Story with Direct Exterior Exiting
185.340	Plan C Buildings - Multi Story with Enclosed interior
185.350	Plan D Buildings - Multi Story with Open Interior
185.360	Specific Requirements - Assembly occupancies
185.370	Exit Requirements and Details
185.380	Interior Travel to Exits
185.390	Construction Requirements and Physical Safeguards
185.395	Sprinkler Protection, Detection and Alarm Systems

SUBPART D: HEATING, VENTILATING AND INCINERATORS

Section	Scope
185.400	Scope
185.405	Heating Capacities
185.410	Methods of Heating
185.415	Unit Ventilators and Unit Heaters
185.420	Space Heaters
185.425	Furnaces and Safety Controls
185.430	Boilers and Safety Controls
185.435	Fuel Burners, Fuel Burning Installations and Heating Installations
185.440	Fuel Burners and Other Heat Sources
185.445	Flue Pipes, Vent Pipes, Smoke Pipes and Draft Controls
185.450	Combustion Air Supply
185.455	Type of Ventilating Systems
185.457	Outdoor Air Required
185.460	Exhaust Systems Required
185.465	Ducts, Fire Dampers and Filters
185.470	Operation of Ventilating Systems
185.475	Stopping of Ventilating Equipment
185.480	Incinerators
185.485	Gas Piping
185.488	Kilns
185.490	Steam Pressure Reducing Valves
185.495	High Pressure Boilers and Safety Controls
185.497	Roof Top or Roof Mounted Heating, Cooling, Heating and Cooling Air Supply Units

SUBPART E: ELECTRICAL SYSTEMS

Section	Scope
185.500	Scope
185.510	General Requirements
185.520	Branch Circuits
185.530	Feeders
185.540	Overcurrent Protection
185.550	Wiring Methods
185.560	Exit Lighting
185.570	Emergency Lighting
185.580	Fire Alarm Systems
185.590	Fire Detection Systems
185.595	Minimum Levels of Illumination

SUBPART F: WATER SUPPLY

Section	Scope
185.600	Scope
185.610	General Requirements
185.620	Quality of Water Supply
185.630	Water Delivery Pressures and Quantities

SUBPART G: TOILETS, PLUMBING AND SEWAGE DISPOSAL

Section	Scope
185.700	Scope
185.710	Plumbing and Sewage. Disposal Requirements
185.720	Domestic Water Heaters - with Fuel Burners
185.730	Domestic Water Heaters - Water, Steam or Electric Heated
185.740	Maximum Water Temperatures

SUBPART H: SEATING

Section	Scope
185.800	Scope
185.810	Assembly Occupancy Seating (Other than Bleachers)
185.820	Educational and Special Educational Occupancy Seating (Other than Bleachers)
185.830	Bleachers

APPENDIX A	Tables Depicting Various Construction Data
TABLE A	Maximum Fire Area
TABLE B	Maximum Height
TABLE C	Maximum Fire Area (SQ. FT.)
TABLE D	Maximum Height
TABLE E	Maximum Fire Area (SQ. FT.)
TABLE F	Maximum Height
TABLE G	Maximum Fire Area (SQ. FT.)
TABLE H	Dimensional and Definitive Limitations of Class A, B, and C Exit Stairs
TABLE I	Dimensional and Definitive Limitations of Class A, B, and C Ramps
TABLE J	Dimensional and Definitive Limitations of Class A, B, and C Fire Escapes
TABLE K	Flame Spread Limitations

AUTHORITY: Implementing and authorized by Section 2-3.12 of The School Code (Ill. Rev. Stat. 1983, ch. 122, par. 2-3.12).

SOURCE: Adopted July 16, 1969; codified at 8 Ill. Reg. 13749.

SUBPART A: AUTHORITY, ADMINISTRATION AND ENFORCEMENT

Section 185.05 Title and Effective Date

- a) This document, including any and all revisions, additions and changes thereto, shall be known and may be cited as "The Building Specifications for Health and Safety in Public Schools" and shall hereinafter be referred to as "this Part."
- b) The effective date, as provided for under Chapter 127, Section 266, Par. 4, of the Revised Statutes of the State of Illinois, of this Part shall be 10 calendar days after that date on which this Part has been duly filed with the Secretary of State by the State Board Of Education or as defined in Section 2-3.12 of The School Code.

Section 185.10 Identification of Titles

- a) The title "State Superintendent," as hereinafter used, shall refer to the State Superintendent of Education of the State of Illinois.
- b) The titles "Regional Superintendent" and "Enforcing Authority," as hereinafter used, shall both refer to the Regional Superintendent of Schools of each county in the State of Illinois. When reference is made to the Enforcing Authority, such shall be construed to be the Regional Superintendent having jurisdiction over the schools or School Boards in question.
- c) The title "School Board," as hereinafter used, shall refer to the governing body of each school district created or operating under the authority of The School Code including a board of school directors and a board of education.
- d) The title "The School Code," as hereinafter used, shall refer to The School Code. References to Section numbers of The School Code are to The School Code in effect on the effective date of this Part.
- e) The title "Advisory Board," as hereinafter used, shall refer to the Advisory Board for School Safety appointed and functioning as provided for under Section 185.80
- f) The title "Safety Survey Report," as hereinafter used, shall refer to the report identified and specified under Section 185.95 of this Part.
- g) The title "Safety Reference Plans," as hereinafter used, shall refer to the plans identified and specified under Section 185.95(e) of this Part.
- h) The title "Plans and Specifications," as hereinafter used, shall refer to the plans and specifications identified and specified under Section 185.90 of this Part.

Section 185.20 Authority and Jurisdiction

- a) This Part has been prepared by the State Superintendent with the advice and counsel of the Department of Public Health, the Supervising Architect, and the State Fire Marshal in accordance with the authority and duty assigned to the State Superintendent by Section 2-3.12 of The School Code.
- b) This Part shall be administered, implemented and enforced in accordance with the rules and procedures hereinafter established which, in turn, are based upon the various powers, duties and responsibilities assigned to the State Superintendent, the Department of Public Health, the Supervising Architect, the State Fire Marshal, the Regional Superintendents and the School Boards by The School Code in general and Sections 2-3.5, and 2-3.6, 2-3.8. 2-3.12, 3-10. 3-14.2, 3-14.20, 3-14.21, 3-14.22 in particular, but not limited thereto.
- c) This Part shall apply to every school except as provided in Section 185.95(c) which is or will be operated by authority of The School Code as of the effective date of this Part with the exception of those schools governed by Article 34 of The School Code and new buildings and additions to existing buildings, the contracts for which have been awarded after July 1, 1965.
- d) This Part shall supersede all provisions of municipal, county, and other local codes and ordinances pertaining directly or indirectly to the protection and conservation of the safety and/or health of pupils while in attendance at schools falling within the jurisdiction of this Part.

Section 185.30 Purpose and Scope

- a) The purpose of this Part shall be to protect the health and safety of pupils through the establishment and enforcement of such minimum standards, specifications and regulations as are necessary in order to secure and maintain a degree of protection that is both adequate and reasonable.
- b) The scope of this Part shall be restricted to those construction features, operating procedures and other considerations which directly affect the, health and safety of pupils. Measures protecting physical property against destruction by fire, explosion or windstorm shall not be considered in themselves as a justifiable basis for any of the standards, specifications and requirements provided herein except in those specific instances when such measures are also required in order to achieve the purpose of this Part.
- c) This Part shall include the following Subparts, each of which establishes such minimum standards, specifications and regulations for the subject matter identified by the title thereof as are necessary in order to achieve the purpose of this Part:
  - 1) Subpart A:--Authority, Administration and Enforcement
  - 2) Subpart B:--Interpretations, Abbreviations, Definitions and Accepted Standards
  - 3) Subpart C:--Safety Against Fire
  - 4) Subpart D:--Heating, Ventilating, and Incinerators
  - 5) Subpart E:--Electrical Systems
  - 6) Subpart F:--Water Supply
  - 7) Subpart G:--Toilets, Plumbing and Sewage Disposal
  - 8) - Subpart H:--Seating
- d) Nothing within this Part shall be construed as prohibiting or discouraging the use of construction, operational procedures and other safety and health-protecting measures which supplement or are superior to or in excess of those required herein. This Part has not attempted, in any way, to include provisions or requirements which will result in improved property insurance rates; and, therefore, it is suggested that a study be made of fire insurance rate considerations at the time of developing the program of compliance with this Part so that economically feasible fire insurance rate improvement measures can be incorporated therein.

- e) Where two or more provisions of this Part are determined to be applicable to a particular condition or situation, specific provisions or requirements shall be considered as having jurisdiction over general provisions or requirements. Where the applicable provisions have the same scope of coverage either specific or general, the less restrictive requirements established thereby shall be considered as applicable to the conditions or situation involved unless otherwise specified.
  
- f) This Part was prepared for normal school children during regular classroom hours. Boarding schools and schools and/or classrooms for the handicapped, such as mentally and physically handicapped, should be given special consideration. Facilities accessible to and usable by the physically handicapped shall be provided in accordance with Chapter 111, par. 11 through 18, of the Illinois Revised Statutes.

---

23 ILLINOIS ADMINISTRATIVE CODE CH. I, S. 185.40  
SUBTITLE A SUBCHAPTER d

Section 185.40 Partial Invalidity

If any term, phrase, sentence, paragraph, Section or Subpart of this Part shall be held unconstitutional or invalid, in whole or in part, such decision shall not be deemed to invalidate the remaining terms, phrases, sentences, paragraphs, Sections and Subparts hereof. The State Superintendent hereby declares that this Part and each term, phrase, sentence, paragraph, Section and Subpart hereof, would have been issued irrespective of the fact that any one or more terms, phrases, sentences, paragraphs, Sections or Subparts be declared unconstitutional.

Section 185.50 School Boards

- a) Each School Board shall be responsible for effecting and maintaining compliance with this Part for every school under its jurisdiction and, in so doing, shall conform with the procedures established by the Enforcing Authority, the provisions of this Part or as defined in Section 2-3.12 of The School Code.
- b) No school, including its mechanical and electrical systems, shall be remodeled or otherwise physically altered to the extent of more than \$1500 in any school year until the Plans and Specifications therefore have been submitted to and approved by -the Enforcing Authority, as provided for under Section 185.60(c)(3), 185.60(d)(2) and 185.90. Such Plans and Specifications shall include all work and other measures necessary-to effect full compliance with this Part for the entire subject school and shall be accompanied by a Safety Survey Report, as required under Section 185.60(d)(2) and 185.95. It is recommended that plans and specifications prepared in accordance with the above be submitted to the State Fire Marshal for his approval. All work of above types shall be promptly reported to Enforcing Authority, regardless of its cost.
- c) Execution of work.
  - 1) Each School Board shall, as soon as possible and practical, initiate and carry out all work and other measures required to effect compliance with this Part for every existing school under its jurisdiction. Nothing within this Part shall be construed, in any way, to prevent, discourage or delay the immediate execution of any work or other measures necessary to correct existing conditions of a critically hazardous nature. Each such condition. where found to exist shall receive immediate attention and priority consideration.
  - 2) All work and other measures necessary to effect full compliance for each existing school with this Part shall be completed within the time schedule established in Section 185.95 of this Part and Section 2-3.12 of The School Code for the completion of such work and other measures for the school in question.
- d) Statement of compliance.
  - 1) When, for an existing school, all of the work and other measures necessary to bring such school into full compliance with this Part has been completed and, in the judgment of the School Board and the responsible architect or engineer (where the use of an architect or engineer is required), the subject

school has been made to comply in full with this Part, the School Board shall file with the Enforcing Authority two copies of a statement claiming such compliance for the subject school. Such statement shall be signed by the School Board and the responsible architect or engineer. When such statement is received and evidence of full compliance is satisfactory to the Enforcing Authority, he or she shall confirm in writing to the School Board the fact that, as of the date of such confirmation, the school has complied in full with this Part.

- 2) The written statement of confirmation from the Enforcing Authority, to the effect that, as of the date of such confirmation, the -school complied with this Part becomes invalid if any physical additions or alterations or any other changes are carried out, which in themselves are not in compliance with this Part, or which render the subject school or any portion thereof not in compliance with this Part.
  - 3) Section 185.50 (d)(2) shall not be construed to require the submittal of a statement of compliance for a construction project having a total cost not more than \$10,000, provided the school involved has previously been confirmed by the Enforcing Authority as being in compliance with this Part and provided further all project work has been carried out in compliance with the approved Plans and Specifications therefore.
- e) Continual compliance. Each School Board shall be held responsible for maintaining and operating every school under its jurisdiction, in full and continual compliance with this Part.
  - f) Each School Board shall keep on file a certificate for each school building under its jurisdiction, prepared by an architect or engineer, listing the maximum number of persons regularly permitted on each story of each fire area and in each assembly area, based on its exit capacity as established by these standards.
  - g) Each school district superintendent shall include in his or her annual report to the State Superintendent of Education the maximum regular occupancy and the maximum capacity of each story of each fire area and of each assembly area.

Section 185.60 Enforcing Authority

- a) The Enforcing Authority shall be responsible for the enforcement of this Part in accordance with the powers granted and the duties assigned to that person by Article 3 of The School Code. In the execution of these enforcement responsibilities, the Enforcing Authority shall follow the procedures hereinafter established.
- b) Where conditions of a critically hazardous nature are found to exist in a school by the Enforcing Authority, the Enforcing Authority shall give individual attention to their correction and shall require immediate execution of those measures which he or she deems to be necessary in order to effect such correction and compliance with this Part; or the Enforcing Authority shall condemn the building, or unsafe portions thereof, as provided for under Section 3-14.22 of The School Code.
- c) Initial compliance for existing schools.
  - 1) The Enforcing Authority shall adopt the procedures deemed necessary in order to bring every existing school within his or her jurisdiction into compliance with this Part at as early a date as is practicable.
  - 2) The Enforcing Authority shall have the power to require and may require the submission -by School Boards of such reports, plans, specifications and other instruments or information as In his or her judgment are necessary or helpful in efficiently bringing existing schools into compliance with this Part at as early a date as is practicable.
  - 3) The Enforcing Authority shall require the preparation and submission to the Enforcing Authority of Plans and Specifications, as described in Section 185.90, for all construction and alteration work required in order to effect compliance with this Part for existing schools, where such Plans and Specifications are required by state law or where deemed by the Enforcing Authority to be necessary or advantageous It is recommended that Plans and Specifications prepared in accordance with the-above be submitted to the State Fire Marshal for his or her approval.
  - 4) The Enforcing Authority shall review and approve all reports and Plans and Specifications in accordance with the procedures established under Section 185.60(e) and (f).
- d) Compliance for other schools.

- 1) The Enforcing Authority shall establish the procedures he or she deems necessary in order to assure that all schools, and all alterations to schools are carried out in such a manner as to effect full compliance with this Part for the schools involved. Such procedures shall be consistent with the requirements and procedural provisions of Sections 185.30 and 185.50.
  - 2) The Enforcing Authority shall require the preparation and submittal for his or her review and approval of the Plans and Specifications as specified under Sections 185.50(b) and 185.90.
- e) Approval of plans and specifications.
- 1) The Enforcing Authority shall review all Plans and Specifications which are prepared, certified and submitted in conformance with the provisions of this Section and Section 185.90. The Enforcing Authority shall satisfy himself or herself as to the accuracy and acceptability of the work and other measures covered thereby and, for existing schools, shall cross-check such work with that described in the approved Safety Survey Reports applicable thereto, where such reports are required to be submitted by the Enforcing Authority's established procedures.
  - 2) The Enforcing Authority shall return to the School Board for resubmittal those Plans and Specifications which:
    - A) Are not prepared and/or certified as provided for in Section 185.90.
    - B) Are incomplete and vague, with insufficient details and specific information, or otherwise not in conformance with the provisions of Section 185.90
    - C) Establish work not in compliance with this Part and/or with that set forth in an approved Safety Survey Report.

EXCEPTION: When only a few minor changes and/or additions to a set of Plans and Specifications are determined to be necessary in order to achieve full acceptability thereof, the required resubmittal of such Plans and Specifications may be waived in whole or in part, provided the School Board involved agrees in writing to accept and carry out each required change and/or addition.

- 3) The Enforcing Authority shall approve in writing all Plans and Specifications which are determined to be acceptable under the provisions of this Part and return two copies thereof to the submitting School Board which submitted them.
- f) Approval of safety survey reports.
- 1) The Enforcing Authority shall approve in writing each Safety Survey Report or other similar report which has been submitted by a School Board for review when he or she is satisfied that such report establishes a definite program that will achieve full compliance with this Part for the subject school.
  - 2) The Enforcing Authority shall return to the submitting School Board for resubmittal each report which fails to establish a definite program that will achieve full compliance with this Part for the subject school. The Enforcing Authority shall also return for resubmittal each report which is incomplete or vague or which does not supply sufficiently detailed information for accurate review of the status of the subject school or of the applicability and suitability of the work and other measures proposed therein.
  - 3) During the course of reviewing each report, the Enforcing Authority shall conduct or cause to be conducted the inspections and investigations he or she deems necessary in order to assure the accuracy and completeness of each report or to clarify questions arising during its review. It is recommended that the Enforcing Authority secure technical assistance from the State Fire Marshal, the Supervising Architect and the Department of Public Health.
- g) Statement of compliance.
- The Enforcing Authority shall review each statement of full compliance submitted as provided for under Section 185.50(d) and shall issue a written statement of satisfactory compliance, as called for therein, when satisfied as to the validity of the School Board's statement.
- h) Work progress report.
- The Enforcing Authority shall conduct an inspection of all schools under his or her jurisdiction annually prior to April 1 of each year following the effective date of this Part and shall submit to the State Superintendent on or before April 1 of each year thereafter a report showing the actual compliance or work progress status of every school under his or her jurisdiction with respect to requirements of this Part.

Section 185.70 State Superintendent.

- a) The State Superintendent under powers granted and duties assigned to him or her by The School Code shall serve as the overall supervisor of the program for applying and implementing this Part.
- b) The State Superintendent shall endeavor to provide each Enforcing Authority the technical assistance, instructions and advice necessary to assure the proper and uniform application and enforcement of this Part.
- c) The State Superintendent, when appealed to for consideration, shall hear and determine controversies arising between the Enforcing Authority and a School Board. The State Superintendent may request the advice and counsel of the Advisory Board, as provided for under Section 185.80, in the course of determining such controversies.
- d) The State Superintendent will request the assistance of the State Fire Marshals office, the Department of Public Health and the Supervising Architect, and will cooperate with them in matters of common concern.

Section 185.80 Advisory Board for School Safety

- a) The State Superintendent will appoint an Advisory Board for School Safety, which shall be referred to in this Part as the "Advisory Board."
- b) The State Superintendent will serve, or designate an employee of the State Board of Education to serve in his or her behalf, as a member of the Advisory Board.
- c) The State Superintendent will invite the Supervising Architect, the State Fire Marshal and the Director of the Department of Public Health to serve as members of the Advisory Board or to designate an individual from their respective staffs to serve on their behalf.
- d) The State Superintendent will appoint six additional members and alternates thereto. Each of these six members and their respective alternates shall be appointed for a period of three years except that, for the original formation of this Advisory Board and the initial appointment of the six members and their alternates, two members and their alternates shall be appointed for a period of one year; two members and their respective alternates for a period of two years; two members and their respective alternates for a period of three years.
- e) The aforementioned six members and their respective alternates will consist of:
  - 1) A practicing, registered architect residing in the State of Illinois, who is experienced in the design of schools,
  - 2) A practicing, registered professional engineer residing in the State of Illinois, who is experienced in the design of mechanical and electrical systems in schools,
  - 3) A registered, professional engineer residing in the State of Illinois, who has specialized experience in the solution of fire safety problems inherent in schools,
  - 4) A member or employee of the Illinois Association of School Boards,
  - 5) A Regional Superintendent of Schools,
  - 6) A public school Superintendent,
  - 7) Additional members as deemed necessary by the State Superintendent.

- f) The Advisory Board will meet upon call by the State Superintendent.
- g) The Advisory Board will provide advice and counsel to the State Superintendent on any matters or controversies referred to it by the State Superintendent. The Advisory Board shall assist the State Superintendent in keeping this Part in an up-to-date condition by evaluating new techniques, methods and procedures for protecting the safety and health of pupils and by recommending the incorporation of those determined to be worthwhile and justifiable.
- h) If permitted and authorized by statute, the State Superintendent will reimburse the members and alternates, other than those employed by the State of Illinois, for all travel and other direct expenses accrued in attending meetings and performing other Advisory Board work assignments.

Section 185.90 Plans and Specifications

- a) Before remodeling a school or making changes outlined in Section 185.50(b) the School Board having jurisdiction shall submit two copies each of plans and specifications respecting heating, ventilating, lighting, seating, water supply, toilets and safety against fire to the Enforcing Authority having jurisdiction for his or her approval. Such plans and specifications, hereinafter referred to as the "Plans and Specifications," shall be prepared in compliance with the provisions of this Section.
- b) The Plans and Specifications shall be of sufficient detail and clarity to accurately and completely define and visually establish the extent, arrangement, quality and specifics of the work prescribed therein.
- c) The Plans and Specifications shall be prepared by or under the supervision of an architect or engineer, as defined in Section 185.220, where so required by state law or where deemed to be necessary by the Enforcing Authority. All Plans and Specifications shall bear the stamp and the following certificate signed by the responsible architect or engineer:

I hereby certify that these plans, and specifications were prepared under my supervision and to the best of my knowledge comply with the "Building Specifications for Health and Safety in Public Schools." These plans and specifications consist of the following:

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Signature and Stamp)

- d) Whenever reference is made in Plans and Specifications to this Part, such reference shall identify the specific Section and subsections) applicable to the subject in question. General sentences or phrases, such as "work shall be in conformance with the Building Specifications for Health and Safety of Pupils in Schools" or "Systems shall be in compliance with applicable regulatory provisions of the state." shall be considered as incomplete and unacceptable unless the work or systems referenced thereby are fully detailed on the Plans and defined in the Specifications.
- e) Plans and Specifications submitted to the Enforcing Authority shall be reviewed and approved or rejected by him or her in accordance with the procedures established under Section 185.60(e).

Section 185.95 Safety Survey Reports

- a) The procedures described in this Section should be given thorough consideration by each Enforcing Authority in developing and establishing the procedures for effecting compliance with this Part for all schools under his or her jurisdiction.
- b) As the initial step for effecting compliance, each School Board shall have each such school surveyed by a registered architect or registered engineer using "Building Specifications for Health and Safety in Public Schools" as a guide, with findings of such survey presented in a report, titled and hereinafter referred to as the "Safety Survey Report." Such report shall be prepared and certified by the surveying architect or engineer and shall conform as closely as possible with the description set forth in this Section.
- c) It is required that a Safety Survey Report, as hereinafter described, be prepared and submitted to the Enforcing Authority on or before July 1, 1967, for all schools constructed prior to January 1, 1955. The School Board of each such district so surveyed and receiving a report of needed recommendations to be made shall have until July 1, 1970, to effectuate such recommendations. Any school constructed between January 1, 1955, and July 1, 1965, shall have a Safety Survey Report completed when it becomes 10 years old and shall be in compliance within three years after the Survey is completed.
- d) Each Safety Survey Report should:
  - 1) Identify and describe all conditions of noncompliance.
  - 2) Describe individually all work and other measures proposed for correcting such conditions.
  - 3) Include the Safety Reference Plans as provided for in Section 185.95(e).
  - 4) Be of such completeness and detail as required in order to permit the Enforcing Authority to accurately review the subject school's safety and health hazards, prevailing conditions of noncompliance with this Part, and all work and other measures proposed in order to effect such compliance.
- e) Safety Reference Plans.
  - 1) Safety Reference Plans, as herein described should be included and submitted as an integral part of each Safety Survey Report.

- 2) Safety Reference Plans for each school, as hereinafter described, should be maintained by the School Board in an up-to-date condition reflecting all additions, alterations, and other changes to the subject school where such affect the arrangement, use, pupil capacity or other information shown thereon.
- 3) Safety Reference Plans should serve not only as a means of indicating the fire safety conditions of a school but also as an aid in developing emergency exit plans and in other operational and-instructional work where reference to overall school layouts is desirable.
- 4) Insofar as is possible, Safety Reference Plans should distinctly identify all alterations and other work items proposed in the Safety Survey Report and, in so doing, differentiate between prevailing or existing conditions and the-additions, alterations and changes proposed thereto.
- 5) Each Safety Reference Plan should be properly titled and dated with each revision thereto identified by number and date.
- 6) Safety Reference Plans should be drawn to scale on tracing paper or cloth suitable for reproduction and subsequent revision. Sheet size should be such as to permit its inclusion (with limited folding) in the binding of the Safety Survey Reports.
- 7) A complete set of Safety Reference Plans should be provided for each school and should include a site plan, a schematic floor plan for each floor and an attic plan (where called for in Number "10" below).
- 8) Site Plan. Each site plan should be drawn with reasonable accuracy to a scale of not less than 200 feet to the inch and should include the following unless included elsewhere in the Safety Survey Report:
  - A) Location and designation-of highways. boulevards, avenues, or streets bordering the site;
  - B) Location and identification of each building on the site;
  - C) Location and description of each building located on property adjacent to the site which is less than 75 ft. away from a school building;

- D) Location and designation of public fire hydrants and municipal fire alarm boxes adjacent to or on the site;
  - E) Location, identification and size of utility supply services (water, gas, electricity, etc.) leading into each building and of the shut-offs for each such service;
  - F) Arrangement of primary walkways and driveways;
  - G) Arrangement of paved play areas and automobile parking areas;
  - H) Location and height of fences and gates therein;
  - I) Indication of unusual terrain conditions.
- g) Schematic floor plans. A schematic floor plan should be drawn for each floor of each building at a scale not smaller than 3/32 in. to the inch. Each such plan should include the following information unless otherwise included in the Safety Survey Report:
- A) A statement establishing the height (number of stories), construction type, protection and Plan classification of each fire area shown on the plan.
  - B) The elevation of each floor level with respect to the floor level of the lowest street floor. The street floor plan shall show the difference in elevation between its floor level and the grade level outside at each point of ingress-egress-for the building.
  - C) The location of all existing or proposed partitions and walls and the identification of those partitions and walls required to have a fire resistance rating.
  - D) The identification of each room and space as to its occupancy.
  - E) The designation of the population capacity for the floor and each occupied room and space thereon.
  - F) The identification of the areas protected or proposed to be protected by a sprinkler system and/or a fire detection system.

- G) The location, arrangement and width of each stairway, ramp, fire resistive passageway, fire escape and slide escape, which serves as a required means of exit and of each corridor, passageway, primary egress aisle or balcony which provides the required path of travel to each such exit.
  - H) The location, direction of swing and width of each door located in the path of travel to a required exit or serving as-part of a required exit.
  - I) The location of vertical openings and the existing or proposed protection for such openings.
  - J). The existing or proposed location of fire alarm boxes, fire alarm horns, exit lights, emergency lighting, and fire alarm control panel.
  - K) The location of primary air distributing or recirculating fans and designation of the areas served by each such fan.
  - L) Location and identification of fuel burning equipment.
  - M) On the basement or lowest street floor plan, if no basement exists, the location and height of service tunnels and under-floor crawl spaces along with the existing or proposed method of separating such tunnel and spaces-from adjacent occupied spaces.
- 10) Attic Plan. A plan should be included for each attic which is used, or can-be used, for storage purposes; which is of combustible construction and used as an open-plenum chamber: or which has an average clear height from the top of the ceiling below to the underside of the roof joists or slab (if no joists exist) of more than 42 inches. Each attic plan should show:
- A) The construction of the roof and ceiling;
  - B) The slope of the roof and such other details as necessary to illustrate the size and arrangement of the attic;
  - C) Access doors, ducts and other openings into the attic and existing or proposed protection for such openings;
  - D) Existing or proposed firestopping for subdividing attics;
  - E) The existing or proposed automatic protection (sprinkler or fire detection) and the area to be protected thereby.

- f) Safety Survey Reports should be submitted to the Enforcing Authority who will review and approve or reject them in accordance with the procedures established under Section 185.60(f).

SUBPART B: INTERPRETATIONS, ABBREVIATIONS, DEFINITIONS  
AND ACCEPTED STANDARDS

## Section 185.200 Interpretations

- a) All words and terms not specifically defined or interpreted in this Part shall be assumed to have their generally accepted meanings.
- b) References to Subpart, Section and Subsection numbers or letters without further designation shall be to Portions of this Part.
- c) The following general interpretations shall apply in the application and enforcement of this Part:
  - 1) Words used in the present tense shall include the future.
  - 2) The singular shall include the plural and the plural the singular.
  - 3) The word "shall" shall have the same meaning as the word "must" and thus, its use shall establish mandatory requirements.
  - 4) The words "occupied" or "used" shall be construed to mean "intended, arranged or designed to be occupied or used."
  - 5) Words used in the masculine gender include the feminine and neuter genders.
- d) Interpretation of the words "School," "Building" and "Fire Area."
  - 1) As defined in Section 185.220 the words "school," "building" and "fire area" have essentially the same general meaning. However, the word "school" is intended to refer to a complete educational facility and, therefore, would refer to all buildings (and fire areas therein) located on a single site, which together comprise one complete educational institution (i.e. a grade school, junior high school, senior high school, etc.).
  - 2) As used in this Part, the word "building" may refer to a complete school structure containing one or more "fire areas" or it may refer to a single fire area comprising only a part of a complete structure.

Section 185.210 Abbreviations

The abbreviations and contractions listed below, when used in this Part, shall be interpreted to have the following meaning:

ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
AGA	American Gas Association Laboratories
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWNA	American Water Works Association
BTU	British thermal unit
BTUH	British thermal unit per hour
cfm	cubic foot (feet) per minute
CS	Commercial Standards - U.S. Department of Commerce
cu. ft.	cubic foot, cubic feet
°F	Degree(s) Fahrenheit

---

DFPA	Douglas Fir Plywood Association
FM	Factory Mutual Engineering Division
FPL	Forest Products Laboratory
fpm	feet per minute
ft.	foot, feet
GA	Gypsum Association
gal.	gallon(s)
gpd	gallons per day (8 hour)
gpm	gallon(s) per minute
hr.	hour(s)
IBR	Institute of Boiler and Radiator Manufacturers Steel Boiler Institute
IIA	Incinerator Institute of America
in.	inches, inch
IUHA	Industrial Unit Heater Association
max.	maximum
min.	minimum
NBFU	National Board of Fire Underwriters (Succeeded by American Insurance Association)
NL	Not Limited
NFPA	National Fire Protection Association
NLMA	National Lumber Manufacturer's Association
Noncomb.	Noncombustible
NP	Not permitted
oz.	ounce

Pi	Perlite Institute
PPM	parts per million
psf	pound(s) per square foot
psi	pound(s) per square inch
Sec.	Section(s)
SJI	Steel Joist Institute
SMCA	Sheet Metal and Air Conditioning Contractor's National Association
sq. ft.	square foot (feet)
UL	Underwriters' Laboratories, Inc.
USBS	United States Bureau of Standards
USDC	United States Department of Commerce
USPH	United States Department of Public Health
VI	Vermiculite Institute

Section 185.220 Definitions

- a) Words and terms used in this Part shall have their generally accepted meaning consistent with the context in which they are used unless otherwise defined in this Section or elsewhere in this Part.
- b) Where used in this Part, the following words and terms shall have the meanings as defined therefore.

"Accepted" As to nationally recognized testing laboratories, authorities, practices and standards, refers to those which are specifically listed in this Part or determined to be acceptable by decision of the State Superintendent.

"Aisle, Primary Egress" An established, interior path of travel to a corridor or an exit, which is unenclosed, partially enclosed or fully enclosed but so constituted as to prevent its classification as a corridor (Section 185.380(c)) or a fire resistive passageway (Section 185.370(e)). A primary egress aisle shall comply with the applicable provisions of Section 185.380(d).

"Alarm System" A system complying with the applicable provisions of this Part, which is designed and installed to produce, upon manual or automatic actuation, a distinct, audible signal easily heard and identified as an emergency alarm by all occupants of- a building.

"Approved" As to materials, devices and equipment, refers to the approval thereof by an accepted national testing laboratory or authority. Materials, devices, and equipment so approved shall be installed and maintained in full compliance with the limitations and specifications upon which their approval was predicated unless otherwise specifically limited or specified in this Part.

"Approved" As to the general arrangements, designs, procedures and programs, refers to approval by the Enforcing Authority or the State Superintendent as being in compliance with this Part.

"Architect" An individual who is a registered architect in the State of Illinois

"Area" As to that of a floor, attic, room or space, shall refer to the total area thereof excluding only that area taken up by the exterior walls. This definition does not apply when determining the population capacity of a floor, room or space. See definition for "Area, Net."

"Area" As of a building or fire area, shall refer to the total floor area of the largest story of the building or fire area excluding only that area taken up by the exterior walls.

"Area, Fire" Where a building is divided by approved fire walls or fire partitions into two or more areas, each area on each floor so formed, shall qualify as a fire area and may be considered a separate building.

"Area, Net" As used for determining the population capacity of a room or a space, refers to that floor area (expressed in square feet) which is subject to normal human occupancy and, thereby, is differentiated from total area by the exclusion of the area occupied by corridors, stairways, small storage closets, cloakrooms, vertical pipe and duct shafts, walls and partitions and other similar spaces or construction elements.

"Area, Smoke" See "Smoke Area."

"Assembly Occupancy" All rooms and spaces in a school having a capacity of more than 200 persons. See Section 185.310(e)(4) and Section 185.360 of Subpart C.

"Attic" That space formed by a roof on the top and a ceiling on the bottom. In peaked roofed buildings, an attic may be formed by a roof on the top and a combination of a ceiling or floor assembly on the bottom and walls or partitions on the side. In this case, an attic is differentiated from a room by its unfinished, normally unoccupied nature (particularly by pupils).

"Automatic" As to devices and systems, refers to those which are so designed and installed as to perform their intended function or functions without reliance on human action or intervention.

"Automatic Sprinkler System" See "Sprinkler System."

"Balcony, Exterior" An unenclosed or partially enclosed walkway which is located on the outside of a building and rigidly affixed thereto and which provides a path of horizontal travel to exterior stairs, fire escapes, smokeproof towers, or other approved means of descending there from to ground level. See Section 185.370(j).

"Balcony, Interior" See "Mezzanine."

"Basement" That occupied portion of a building which is located below the street floor or, where there is more than one street floor, below the lowest of such floors. Tunnels and under floor crawl spaces, unless specifically qualifying as "unoccupied" as defined herein, shall be considered as basements. See definition for "Street Floor" and also Section 185.390(c) and Section 185.390(d).

"Building" A structure affording shelter for persons and property, which is wholly or partially enclosed by a wall or walls and a roof excluding canopies and covered walkways. Where a structure, as defined in the foregoing sentence, is divided into two or more fire areas by approved fire partitions or firewalls, -each fire area so formed may be considered as a separate building. See Section 185.200(d) and definition for "Fire Area."

"Capacity" As of a stair, doorway, fire escape, etc., shall refer to that number of persons considered able to use such stair, doorway, escape, etc., as a means of exit or travel thereto - based upon the units of exit width thereof multiplied by the corresponding rated capacity per unit of exit width.

"Capacity" As of a floor, room or space, shall refer to the population capacity thereof determined as prescribed under Section 185.310(e).

"Cased Doorway or Opening" A doorway or an opening in a permanent wall or partition which is formed by rigid structural members of such wall or partition.

"Ceiling, Fire Resisting" A ceiling which serves as a vital and necessary part of a fire resistance rated floor or roof assembly. See Section 185.390(b)(2).

"Combustible" As applied to materials of construction and to furnishings and contents, refers to those which-do not qualify as "noncombustible" as defined in this Section.

"Contents" Those materials, furnishings and equipment located within a building which are not permanently or rigidly affixed to the building construction. The word "contents," as used in this Part, primarily refers to materials or furnishings of a movable nature serving functional, decorative or maintenance purposes.

"Corridor" An enclosed interior path of horizontal travel to an exit which complies with the requirements of Section 185.380(c) but which does not qualify as a fire resistive passageway. See definitions for "Passageway, Fire Resistive" and "Aisle, Primary Egress."

"Court" An open, normally unoccupied space bounded on two or more sides by the walls of a building. An inner court is a court entirely surrounded by building walls. All other courts are outer courts.

"Dead Load" The weight of all permanent construction including walls, framing, partitions, floors, ceilings, stairways, roof and all permanent building service equipment calculated and distributed in accordance with referenced accepted national practices and standards.

"Distance of Exit Travel" That distance required to reach the nearest exit from the most remote spot in the room or space under consideration following the primary path of exit travel leading thereto. See Section 185.370(4).

"Door, Exterior Exit" A door located in an exterior wall of a building which provides an approved means of exit from within the building to either a place of safe refuge on the outside or to an exterior balcony, landing, or bridge which, in turn, leads to an approved means of ascending or descending to a place of safe refuge. See Section 185.370(m).

"Door, Fire" A door located in a fire resistance rated wall which, when referred to in this Part, is required to be tested and listed by UL, to be installed complete with hardware in conformance with the limitations of such listing. The rating of such doors shall be Class A, B, or C as specified, with such ratings corresponding to those established by the UL and NFPA 80, 1962.

"Door, Interior Exit" An interior door which provides an approved means of entry into an interior exit stair, ramp or fire resistive exit passageway, or which functions as an horizontal exit. See Section 185.370(m).

"Door, Self-Closing" A door normally maintained in the closed position and equipped with a reliable closing device which will automatically cause such door, when opened manually, to return to the closed position. No hold-open features shall be permitted except as specifically allowed under Section 185.370(m)(B).

"Door, Solid Core Wood" A door not less than 1 3/4 in. thick; of wood plank or solid laminated construction with wood or noncombustible core material; with all borrowed light or vision panels therein glazed with wired glass, except that 40 oz. and 1/4 in. plate glass may be used where specifically permitted under this Part. Where solid core wood doors are required under this Part, existing wood panel doors of stable construction shall be permitted -in lieu thereof, provided such doors are surfaced on both sides with sheet steel not less than 22 gauge. Such sheet steel surfacing shall be continuous over all panels and shall be so installed that all remaining exposed wood surfaces are of such thickness and construction as to comply with the minimum thickness requirements heretofore established for solid core wood doors. Such sheet steel shall be required on one side only where one or both sides of the involved wood panel door are exposed to Educational and/or Assembly Occupancy rooms or spaces, provided, however, that such surfacing shall be on that side of the door when in the closed position which is exposed to the occupancy having the highest fire intensity potential.

"Educational Occupancy" See Section 185.310(e)(5).

"Enclosed Interior" See Section 185.310(c)(2).

"Engineer" an individual who is a registered structural or professional engineer in the State of Illinois.

"Existing" As to buildings and physical facilities therein, refers to those which are in existence on the effective date (Section 185.10(b)) of this Part or whose contracts were awarded prior to July 1, 1965.

"Exit (also Means of Exit)" An approved means of protected travel to a place of safe refuge complying with the applicable provisions of-Section 185.370(b). See also definitions for "Exit, Exterior," "Exit, Horizontal," "Exit, Stair" and "Passageway, Fire Resistive.'

"Exit Door" See "Door, Exterior Exit" and "Door, Interior Exit."

"Exit, Exterior" An approved means of exit which starts at a doorway in the exterior wall of a building and leads directly to an outside place of safe refuge or indirectly thereto by an approved exterior means of exit travel (i.e. exterior exit stair, ramp, balcony, bridge, or roof walkway, fire escape, slide escape, etc., or combination thereof) as specified under Section 185.370 of Subpart C of this Part.

"Exit, Horizontal" An approved means of exit leading horizontally to a place of safe refuge in an adjacent building or fire area. See definition for "Place of Safe Refuge" and Section 185.370(g).

"Exit Stair (also Exit Ramp)" An enclosed interior stair or ramp conforming with the requirements of Section 185.370(c) and Section 185.370(d).

"Fire Area" See "Area, Fire."

"Fire Detection System" An automatic system which, as a minimum, will actuate the building fire alarm system when a fire occurs in the areas required to be protected under this Part. See Section 185.395(c) and Subpart E.

"Fire Door" See "Door, Fire."

"Fire Partition" A wall or partition of stable construction having not less than 2-hour fire resistance rating in buildings more than five stories in height and 1-hour otherwise, which is so installed as to effectively prevent the passage of fire, smoke or heat from one side to the other. A fire partition shall extend from the lowest floor (basement floor, if any) upward to the roof. Offsets at intermediate floor levels shall be permitted where the floors and their supporting members have a fire resistance rating at least equivalent to that of the partition, and there are no openings piercing the offset portion of the floors. See Section 185.390(g)(2).

"Fire Resistance Ratings" The time in minutes or hours that a material or an assembly of materials will successfully sustain exposures to fire as determined by a fire test conducted in conformance with the applicable provisions of ASTM E119-58 "Standard Method of Fire Tests of Building Construction Materials."

"Fire Resistive Ceiling" See "Ceiling, Fire Resisting."

"Fire Resistive Passageway" See "Passageway, Fire Resistive."

"Firestopping" As to attics and concealed spaces above ceilings, refers to the division of such spaces and attics into two or more smoke areas by the installation of partitions extending across such attics and spaces in such a manner as to retard the spread of heat smoke and gases there-through. See Section 185.390(i)(1).

"Firestopping" As to concealed spaces within partitions, refers to the subdivision thereof into small smoke areas by the installation of horizontal constructions so installed as to retard the spread of heat, smoke or gases there-through. See Section 185.390(i)(2).

"Fire Wall" A fire partition, as defined herein, of stable, noncombustible construction having a fire resistance rating of not less than two hours with each opening therein protected by an approved Class A fire door or approved fire dampers except as otherwise provided in this Part. See Section 185.390(g)(2).

"Flameproofing" The treatment of combustible materials, usually of a fabric nature, by application of approved chemicals or other coatings to reduce the ignitability of the materials and prevent the propagation of flame under test conditions.

"Flame Spread Rating" That rating of the interior finish (as defined in this Section) of a building which reflects the speed of flame travel over such surfaces when exposed to the standard flame spread test as established in ASTM E84-61 "Standard Method of Fire Hazard Classification of Building Materials." Such rating shall be numerical and based upon the scale where asbestos-cement board rates zero and red oak lumber rates 100. See Section 185.390(j).

"Flammable" As to gases or solids, refers to those which ignite easily and burn rapidly and intensely.

"Flammable Liquid-" A liquid having a flash point below 200°F and having a vapor pressure of not more than 40 psi (absolute) at 100°F, when tested in accordance with the procedures established in NFPA 30-1963.

"Flight of Stairs" The combination of consecutive treads and risers furnishing a path of travel between a floor and the landing level next above or next below.

"Floor Assembly" The combination of materials providing horizontal separation between stories including all horizontal structural members supporting the floor as well as the floor construction itself. When fire resisting ceilings are used in order to achieve the fire resistance rating required for a floor assembly, such ceiling shall be included as an integral part of the floor assembly.

"Grade" The ground level adjoining the exterior walls of a building at each point of ingress-egress. Artificial raising or lowering of such ground level shall be permitted provided the area, contour and stability of the artificially altered portion is such that it may be safely used for attendant exit purposes with reliable and adequate means of access to a street or open yard area provided. The slope of grade used for exit purposes shall not exceed one foot in every eight feet.

"Height" The greatest number of stories above the floor level of the lowest street floor occurring at any location within the fire area under consideration. (See definition for "Story.")

"Horizontal Exit" See "Exit, Horizontal."

"Incombustible" Same as "Noncombustible."

"Inflammable" Same as "Flammable."

"Interior Door" See "Door, Interior Exit."

"Interior Finish" The interior finish of a building shall refer to those surfaces which are exposed to view in occupied rooms or spaces except as otherwise specified under Section 185.390(j) And which are an integral part of the building or are permanently affixed thereto.

"Live Load" The weight imposed solely by the occupancy and by nature's elements. See definition for "Dead Load."

"Means of Escape" See "Secondary Means of Escape."

"Means of Exit" See "Exit."

"Mezzanine" An intermediate floor placed within and open to a room of a building. If the floor area of a mezzanine is more than one-third the area of the floor below, it shall be considered as constituting an additional story.

"New" As to buildings and physical facilities therein, refers to those which do not qualify as "existing" as herein defined.

"Noncombustible" As applied to building construction material, means a material which, in the form in which it is used, falls in one of the following groups, (A) through (C). It does not apply to surface finish materials less than 1/16

in, thick nor to the determination of whether a material is noncombustible from the standpoint of clearances to heating appliances, flues, or other sources of high temperature. No material shall be classed as noncombustible which is subject to increase in combustibility or flame spread rating beyond the limits herein established, through the effects of age, moisture, or atmospheric condition.

- A) Materials, no part of which will ignite and burn when subjected to fire. Any material which liberates flammable gas when heated to a temperature of 1380°F for five minutes shall not be considered noncombustible within the meaning of this paragraph.
- B) Materials having a structural base of noncombustible material, as defined in (A), with a surfacing not over 1/8 in. in thickness which has a flame spread rating not higher than 50.
- C) Materials, other than as described in (A) and (B), having a surface flame spread rating not higher than 25, without evidence of continued progressive combustion, and of such composition that surfaces that would be exposed by cutting through the material in any way would have a flame spread rating not higher than 25 without evidence of continued progressive combustion. See "Flame Spread Rating."

"Noncombustible" As applied to building contents and furnishings, refers to those materials which will not ignite when exposed to a temperature of 1380 °F for five minutes and continue to support combustion or liberate flammable gases after the removal of the heat source.

"Occupied" As to rooms or spaces in a building, refers to all which cannot qualify as "Unoccupied" as defined in this Section.

"Open Interior" See Section 185.310(c)(2).

"Passageway, Fire Resistive" A protected means of horizontal travel leading directly to the outside or to another approved exit, which in itself qualifies as an exit by virtue of its construction and arrangement being in compliance with the requirements established in Section 185.370(e).

"Place of Safe Refuge" An area or space into which an exit(s) discharges which is adequately protected against the effects of a fire occurring in the portion of the building exiting there into; which is adequate in size to accommodate the number of persons that may exit there into based upon 3 sq. ft. of net area per person; and which is provided with not less than one approved means of safe travel leading to a street or an unrestricted open yard area. A place of safe refuge may be inside or outside of a building. Where located inside, a place of safe refuge shall further comply with the applicable provisions of Section 185.370(g).

"Plenum" An air compartment or chamber, formed by building construction elements, to which one or more ducts or air openings are connected and which thereby serves as the system of air movement for the subject building.

"Primary Path of Travel" The primary route of travel from a room or space to the required exit(s) using an established corridor or primary egress aisle with a minimum amount of travel (if any) permitted through adjacent occupied rooms or spaces enroute to such aisles or corridors. See Section 185.380(a) and Section 185.380(b).

"Room" That portion of a building enclosed on the interior by fixed walls or partitions which extend from the floor below tight to the ceiling (if any) or floor-roof above and so arranged as to effect a full separation from adjoining rooms or spaces. Openings through such enclosing walls and partitions shall be limited in size unless provided with hinged doors, fixed sash or other means of retarding passage of heat, smoke and fumes from one side-to the other. A room may be comprised of several "spaces" as defined in this Section.

"Roof Assembly" The combination of materials providing horizontal separation or protection for a building from the outside elements including all horizontal supporting structural members as well as the roof construction and covering. Where fire resisting ceilings are used in order to achieve the fire resistance rating required for a roof assembly, such shall be included as an integral part of the roof assembly.

"School" A building, or portion thereof, occupied in whole or in part by pupils and operated by the authority of The School Code. See Section 185.200(d) and the definition of "Building."

"Secondary Means of Escape" A way of escape from a room or space to the outside in an emergency in case of blocking of the required exits or paths of travel thereto. See Section 185.370(n).

"Secondary Path of Travel" A route of travel eventually leading to an exit which normally passes through adjacent rooms or spaces enroute and which does not qualify as a primary path of travel as defined in this Section. See Section 185.380(b).

"Separated" As to exits or paths of travel to exits (either primary or secondary as defined in this Section), refers to two exits or paths of travel thereto which are so separated by smoke screens, fire partitions, corridor enclosure walls and other partitions and walls of equivalent construction as to prevent both exits and/or both paths of travel from becoming simultaneously unusable as a result of heat, smoke or gas accumulation developing from a single fire. See Section 185.380(b)(5).

"Smoke Area" In a building having an enclosed interior arrangement (Section 185.310(c)(2)), refers to the area within a corridor formed by the corridor enclosure walls or partitions and those interior walls or partition extending across such corridor, which qualify for consideration as a smoke screen (Section 185.390(g)(3)).

"Smoke Area" In a building having an open interior arrangement (Section 185.310(c)(2)), refers to that area formed by exterior walls and/or by those interior walls or partitions which qualify for consideration as smoke screens (Section 185.390(g)(3)). Where, under this Part, the maximum size of smoke areas is limited, such shall apply to all smoke areas except for Class A and B Assembly Occupancy rooms.

"Smoke Screen" An interior wall or partition so designed and constructed as to prevent the passage of heat, smoke and gases from one side thereof to the other side during the early stages of a fire. Such wall or partition shall further comply with the requirements of Section 185.390(g)(3). Fire walls and fire partitions may be considered as a smoke screen where openings therein are protected by self-closing doors or dampers in compliance with the requirements of Section 185.390(g)(3).

"Space" That portion of a room which is separated from adjoining areas by fixed or movable walls or partitions which do not provide effective means for retarding passage of heat, smoke or gases from one side to the other due to large unobstructed and unprotected openings therein but which have an effect on the safe evacuation of the occupants thereof. Accordion-type or folding partitions or large doors in walls or partitions otherwise designed as called for in the definition for a "room" would result in the classification of the area enclosed thereby as a "space." The use of partitions which do not extend to the ceiling (if any), floor or roof above would likewise result in the classification of the area enclosed thereby as a space.

"Special Educational Occupancy" See definition in Section 185.310(e)(6).

"Sprinkler System" An automatic system so designed and installed to discharge water in spray form over the area where the buildup of heat is such as to cause actuation of approved sprinkler heads. See Section 185.395(b).

"Sprinklered" As to a building, room or a fire area, refers to spaces which are protected throughout by an approved automatic sprinkler system in compliance with the requirements of Section 185.395(b).

"Storage Occupancy" See definition in Section 185.310(e)(7).

"Story" That portion of a building included between the upper surface of one floor and the upper surface of the floor next above, except that the topmost story shall be that portion of a building between the upper surface of the topmost floor and the ceiling or roof above. A basement shall not be considered as a story for the purposes of this Part.

"Street" Includes any street in the generally accepted sense of the word and, in addition, includes any sidewalk, walkway, or platform designed for pedestrian traffic which provides free and safe access to a street or other open spaces at grade level. Areaways through buildings, tunnels and covered corridors shall not be considered as streets.

"Street Floor" A floor directly accessible to the street or grade level outside which has a floor level not more than three feet below grade at the points of primary ingress-egress. When grade variations are such that more than one floor qualifies as a street floor, all floors so qualifying shall be classified as such. See definitions for "Grade" and "Basement."

"Travel, Distance of Exit" See "Distance of Exit Travel."

"Travel, Primary Path of" See "Primary Path of Travel."

"Travel, Secondary Path of" See "Secondary Path of Travel."

"Uncased Doorway or Opening" A doorway or opening which does not qualify as a "Cased Doorway or Opening" as defined in this Section. An uncased doorway would normally be formed by removable furnishings, partitions, lockers, etc.

"Unit of Exit Width" As used in establishing the capacity of exits and exit and egress doorways, refers to a basic clear width figure of 18 in. Each 18 in. in width represents one unit of exit width. Fractions of a unit shall be disregarded except that 12 in. or more, when added to one or more full units, may be counted as one-half a unit.

"Unoccupied" That space within a building which is not used for storage or for any other functional purposes whatsoever and which is so cut off or otherwise maintained as to prevent such use. Unoccupied spaces, subject to the foregoing restrictions, would include attics, tunnels, under floor crawl spaces, utility shafts, concealed spaces above suspended ceilings and within walls, etc.

"Unsprinklered" A building or fire area not qualifying as "sprinklered" as defined in this Section. See Section 185.395(b) and Section 185.395(c).

"Vertical Openings" An opening passing through one or more floors such as used by stairways, utility shafts, light shafts, elevators, dumbwaiters, ducts, etc. See Section 185.390(h).

Section 185.230 Nationally Recognized Testing Laboratories

The following named Nationally Recognized Testing Laboratories are accepted:

American Gas Association Laboratories 1032 East 62nd Street, Cleveland, Ohio

Bureau of Mines, U.S. Department of Interior  
Central Experiment Station  
4800 Forbes Street, Pittsburgh, Pennsylvania

Factory Mutual Laboratories (Factory Mutual Engineering Division)  
1151 Boston-Providence Turnpike  
Norwood, Massachusetts

Forest Products Laboratory, U.S. Department of Agriculture North Walnut  
Street, Madison, Wisconsin

National Bureau of Standards, U.S. Department of Commerce Washington,  
D.C.

Ohio State University, Engineering Experiment Station 156 West 19th Avenue,  
Columbus, Ohio

Southwest Research Institute  
8500 Culebra Road, San Antonio, Texas

Underwriters' Laboratories, Inc.  
207 East Ohio Street, Chicago, Illinois

Underwriters' Laboratories of Canada  
7 Crouse Street, Scarboro, Ontario, Canada

SUBPART C: SAFETY AGAINST FIRE

Section 185.310 General Provisions

a) Scope

- 1) Subpart C establishes the minimum requirements for safeguarding pupils against the injurious and death-dealing effects of fires, explosions and their accompanying by-products.
- 2) The provisions of this Subpart are restricted to those considerations pertinent to the prevention of fire and explosion occurrences and to the safe evacuation of pupils in the event of such an occurrence.
- 3) The provisions of this Subpart are based upon the prerequisite that each building is structurally sound and safe. The minimum requirements for structural safety are set forth in Section 185.390(l). Measures required to effect compliance therewith shall be included as an integral part of the overall program for effecting full compliance with this Part.
- 4) Many of the requirements hereinafter provided are based upon the classification of building's construction, protection, layout plan, occupancies and population capacities. It shall be necessary, therefore, as a prerequisite to the application of the requirements of this-Subpart to establish such classifications for each building in accordance with the provisions of Section 185.310(b) through 185.310(e).

b) Construction Classification

- 1) Each fire area of each building shall be classified into one of the construction types listed and defined in Section 185.390(b).
- 2) No fire area shall be classified as belonging to a given construction type unless it complies with the requirements established for such type.
- 3) Where two or more construction types occur in the same fire area, the entire fire area shall be classified as belonging to that construction type having the poorest safety and fire resistance qualities.
- 4) EXCEPTION: Where the poorer construction type involves not more than 10% of the total fire area, the Enforcing Authority

may permit the area to be classified as belonging to the superior construction type provided that such classification will not, in his opinion, jeopardize life safety.

c) Plan classification

1) Each fire area shall be classified on the basis of its arrangement into one of the Plans listed below and defined in Section 185.320 through Section 185.350 of this Part:

- A) Plan A - Single Story (Section 185.320)
- B) Plan B - Multi-Story with Direct Exterior Exiting (Section 185.330)
- C) Plan C - Multi-Story with Enclosed Interior (Section 185.340)
- D) Plan D - Multi-Story with Open Interior (Section 185-350)

2) Enclosed and open interior

- A) The term "enclosed interior," as used in this Part, shall refer to an interior arrangement consisting of rooms instead of spaces, and corridors instead of egress aisles. Under this arrangement, full height walls and partitions complying with the applicable provisions of Section 185.390(g)(4) and Section 185.390(g)(5) shall provide complete interior enclosure for each classroom, corridor, office area, clinic, study hall, locker room and other similar Educational Occupancy areas as well as for the required enclosure of each of the rooms housing other Occupancies. The complete enclosure of individual Educational Occupancy rooms or spaces under this arrangement shall not be mandatory for those rooms or spaces having a capacity of less than 10 persons.
- 8) The term "open interior," as used in this Part, shall refer to an interior arrangement not qualifying as an "enclosed interior" arrangement, as defined in the preceding Paragraph by reason of the absence of full separations between Educational and/or Special Educational Occupancies.

3) The term "direct exterior exiting," as used in this Part, shall refer to an arrangement of a building of a fire area wherein every room and space therein having a capacity of more than 10 persons, if such building or fire area is

unsprinklered, and 20 persons if sprinklered, is provided with at least one approved exterior exit. Those rooms or spaces having a capacity less than that prescribed in the preceding sentence shall be so located that the distance of exit travel is not more than 75 feet in an unsprinklered building or fire area or 100 feet in a sprinklered building or fire area.

- 4) Where the physical arrangement of a building or fire area largely but not completely complies with the definitive limitations established for one of the Plans listed above, such work or other measures shall be carried out as required to effect full compliance therewith, or such building or fire area shall be classified as belonging to that Plan listed next below which most nearly resembles its arrangement.
- d) Protection classification
- 1) Each fire area of every building shall be classified as either unsprinklered or sprinklered, depending upon the extent and acceptability of the automatic protection therein.
  - 2) No fire area shall be classified as "sprinklered" unless such is protected by an approved automatic sprinkler system complying in full with the requirements therefor as provided under Section 185.395(b), except where specific exception thereto is permitted in Sections 185.320 through Section 185.350 of this Subpart.
  - 3) When credits or allowances are permitted in this Part for a "sprinklered" building or fire area, such shall apply only to those buildings or fire areas which comply in full with the foregoing paragraph.
  - 4) Where credits or allowances are permitted in this Part for the provision of sprinklers in certain specific areas, such shall apply only to those specific areas which are protected throughout by an approved sprinkler system.
  - 5)- Approved sprinkler protection may be substituted without restriction for any fire detection required under this Part. The reverse application of this provision however, shall not be allowed unless specifically provided for elsewhere in this Part.
- e) Occupancy classification
- 1) Each occupied room and space in a school shall be classified by the nature of its use into one of the occupancy groups listed below and defined in Sections 185.310(e)(4) through 185.310(e)(8) respectively:

- A) Assembly Occupancy
  - B) Educational Occupancy
  - C) Special Educational Occupancy
  - D) Storage Occupancy
  - E) Mechanical Occupancy
- 2) Where a room or space is used for two or more purposes belonging to different occupancy groups, the room or space shall be considered to belong to that group which is governed by the most stringent safety requirements.
- 3) Where the occupancy of a room or space cannot logically be classified into one of the established occupancy groups, the room or space shall be specifically identified as to its use and shall comply with those provisions of this Part which apply to the occupancy group considered to be most similar from the life safety and fire hazard standpoint.
- 4) Assembly occupancies
- A) Assembly Occupancies shall include all rooms and spaces which are used for the gathering therein of more than 200 persons.
  - B) In a building having an open interior arrangement, wherein a room may contain several spaces (see definition therefore under Section 185.310(c)(2)), with each space used for Educational and/or Special Educational Occupancy purposes, such room shall not be considered as an Assembly Occupancy even though the total capacity of such room may exceed 200 persons. This provision shall not be construed to eliminate the classification as an Assembly Occupancy of a room that has been subdivided into two or more spaces by accordion-type, folding or portable partitions, which are so arranged as to enable the entire room area to be used for the gathering of more than 200 persons for educational, recreation or meeting purposes.
  - C) For the purpose of this Part, Assembly Occupancies shall be divided into the following sub-classifications based upon their relative capacity:
    - i) Class A Assembly Occupancy -- capacity more than 1000 persons

- ii) Class B Assembly Occupancy - capacity more than 600 persons but not more than 1,000 persons
  - iii) Class C Assembly Occupancy - capacity more than 200 persons but not more than 600 persons
- 5) Educational Occupancies
- A) Educational Occupancies shall include all of those rooms or spaces used for normal educational purposes by not more than 200 persons which possess ordinary or less-than-ordinary life safety and fire hazard problems.
  - 8) Educational Occupancies shall also include locker rooms, toilets, offices, corridors, stairs and rooms or spaces accessory to normal classrooms which possess-ordinary or less than ordinary life safety and fire hazard problems.
  - C) Teachers' closets not more than 12 sq. ft. in area with access doorway there into leading directly from a normal Educational Occupancy classroom shall be considered as part of such classroom and, thereby, classified as an Educational Occupancy. Closets, not included within the scope of the preceding sentence, shall be classified as Storage Occupancies.
  - D) Cloakrooms not more than 100 sq. ft. in area with access doorway there into directly from a normal Educational Occupancy classroom shall be considered as part of such classroom and thereby, classified as an Educational Occupancy, provided-the use of such cloakrooms is restricted to that attendant with the normal storage of wraps, coats and other human apparel. Where cloakrooms are used for any purposes other than that of storage of cloaks, wraps, and other human apparel or are more than 100 sq. ft. in area, such rooms shall be classified as Storage Occupancies and shall comply with the requirements of Section 185.390(f)(1).
- 6) Special Educational Occupancies
- A) Special Educational Occupancies shall include all rooms and spaces which are used by not more than 200 pupils for educational, recreational and other purposes and which, due to their nature, possess greater-than-ordinary life safety and fire hazard problems.

- B) Special Educational Occupancies shall include, but not be limited to, industrial arts rooms, shops, home economics rooms, laboratories, arts-crafts classrooms, cafeterias (and kitchens accessory thereto), libraries, dormitories, drama workshop rooms, etc. Bus and automobile garages shall be considered as Special Educational Occupancies where subject to use or occupancy by pupils. Otherwise, such garages shall be considered as Storage Occupancies.
  - C) Teachers' closets and cloakrooms with access doorways leading directly from Special Educational Occupancy Classrooms shall be considered as part of such classrooms, provided such conform with the limitations established under Section 185.310(e)(5)(C) and (D), respectively.
- 7) Storage Occupancies
- A) Storage Occupancies shall include all rooms and spaces in a school which are used for storage or for building maintenance and repair purposes.
  - B) Moveable and permanent shelving and cabinets which are located in and accessory to those rooms and spaces whose primary use is not that of storage (as defined herein), shall be considered to be part of the rooms or spaces in which located and governed by the provisions applicable to the occupancy groups of such rooms and spaces.
  - C) All closets and cloakrooms shall be considered as Storage Occupancies except for those teachers, closets and cloakrooms covered by the provisions of Sections 185.310(e)(5)(C), 185.310(e)(5)(D) and 185.310(e)(6)(C).
- 8) Mechanical Occupancies
- A) Mechanical Occupancies shall include all rooms and spaces in a school which are used primarily to house mechanical equipment of a permanent nature. For the purpose of this Part, mechanical equipment shall be construed to also include transformers, electrical switchgear, motors and other equipment and devices of a similar nature powered by electricity.
  - B) Mechanical Occupancies shall be divided into the following sub-classifications:

- i) Boiler Rooms - those rooms housing fuel-burning equipment whose purpose is to provide heat for space heating or domestic hot water. Except variations permitted under Section 185.390(e)(2).)
    - ii) Mechanical Equipment Rooms - those rooms housing non-fuel-burning mechanical equipment including, but not limited to, those rooms used to house transformers, electrical switchgear, air compressors, pumps, motor or steam turbine-driven air distribution fans with heat (if any) provided by hot water or steam coils and air conditioning units other than gas fired.
  - C) Fuel storage rooms and incinerator rooms shall be considered as a Mechanical (Boiler Room) Occupancy.
- f) Population Capacity
  - 1) The population capacity of each occupied room and space and each floor in a building shall be determined as hereinafter set forth. When a building is subdivided into two or more fire areas, the population capacity of each floor within each fire area shall be determined.
  - 2) The population capacity of a room or space shall be the maximum number of persons that may occupy such room or space at any time or that number computed as hereinafter provided, whichever number is the greater.
    - EXCEPTION: In the event that the capacity (determined as provided above) of a floor, room or space exceeds the allowable capacity of the exits provided therefor, additional exits shall be provided or the number of occupants of such floor, room or space shall be restricted to that figure established by the capacity of the available exits. In the latter case, the measures taken to effect such restriction shall be set forth in writing and approved by the Enforcing Authority.
  - 3) The capacity of each floor shall be not less than the sum of the capacities of all rooms and spaces thereon which are subject to simultaneous occupancy but, in no case, shall such capacity be more than the total capacity of the available exits.

- 4) The computed capacity of rooms and spaces used for Assembly, Educational and Special Educational Occupancies shall be that number of persons arrived at by dividing the net floor area (sq. ft.) of such rooms or spaces by the applicable figures shown in the following table:
- A) Assembly Occupancies
    - i) Cafeterias 15
    - ii) Auditoriums and theaters (fixed seats) 6
    - iii) Bleacher areas 4
    - iv) Gymnasiums, playrooms, multi-purpose and other assembly rooms using fixed or moveable seats 6
    - v) Standing room areas (foyers, entranceways, etc.) 3
    - vi) Study halls (capacity over 200) 12
  - B) Educational and Special Educational Occupancies
    - i) Cafeterias (capacity under 200) 15
    - ii) Study halls ( capacity under 200) 12
    - iii) Normal classrooms 18
    - iv) Libraries 25
    - v) Cooking rooms, science laboratories, arts and crafts 30
    - vi) Industrial arts rooms, student shops and garages with student occupancy 50
    - vii) Locker rooms 10
    - viii) Offices, clinics and counseling 20
- 5) The computed capacity of Mechanical and Storage Occupancy rooms and spaces and of those basements not subject to occupancy by pupils shall be calculated on the basis of one person per 100 sq. ft. of net floor area therein.

g) Capacity and use restrictions

- 1) The capacity of a floor, room, or space shall not exceed the total capacity of the approved exits serving such floor, room or space.
- 2) No change in the use of a room or space which would necessitate the reclassification of the occupancy group of the room or space shall be made unless all work and other measures are carried out as required to effect full compliance with this Part for the new occupancy group.
- 3) No change in the size or arrangement of a room or space shall be made unless all work and other measures are carried out as required. to effect full compliance with this Part for the new size or arrangements of the room or space.
- 4) No room or spate which is considered as being unoccupied in establishing the applicable protection and exit requirements shall be used for any storage, maintenance or repair work or for any other functional purpose whatsoever unless such room or space is made to comply in full with all of the provisions of this Part applicable to such use.

Section 185.320 Plan A Buildings - Single Story

a) General

- 1) The requirements of this Section shall apply to all buildings not more than one story in height with or without basements. Such buildings shall be referred to in this Part as "Plan A buildings."
- 2) All requirements established in Sections 185.360 through 185.395 of this Subpart shall be considered to apply to all Plan A buildings, unless otherwise specified in this Section.
- 3) Where reference is made herein to "enclosed interior" or "open interior" arrangements, such shall refer to those interior arrangements complying with the definitive limitations established therefor under Section 185.310(c).
- 4) Where reference is made herein to Plan A buildings with "direct exterior exiting," such shall refer to those buildings provided with exit arrangements complying with the definitive limitations established under Section 185.310(d).
- 5) In accordance with the provisions of Section 185.310(b), each fire area in each Plan A building shall be classified into one of the five construction types listed and defined under Section 185.390(b).

b) Protection Classification

- 1) In accordance with the provisions of Section 185.310(d), each fire area of each Plan A building shall be classified as "sprinklered" or "unsprinklered" as specified in Section 185.395(b) and (c), subject to the allowable exceptions thereto established under this Subpart.
- 2) Plan A Buildings with Exterior Exiting.
  - A) Sprinklered. A sprinklered Plan A building with direct exterior exiting shall comply with the requirements of Section 185.395(b) except that approved fire detection may be substituted for the required sprinkler protection in those areas specified therein and in the following:
    - i) In all Educational Occupancy rooms and spaces (including corridors) which have an interior finish flame spread rating of not more than 75.

- ii) In all attics and other concealed spaces above ceilings.
- B) Unsprinklered. An unsprinklered Plan A building with direct exterior exiting shall comply with the requirements of Section 185.395(c) except that the fire detection required therein may be omitted in the following areas:
  - i) Throughout the street floor and attics of those buildings and fire areas of Type I, II, III and IV construction which have an interior finish flame spread rating (surfaces exposed to occupied areas) of not more than 75. The foregoing allowable omission shall not apply to stages, storage rooms, dressing rooms and under stage areas located in Class A and B Assembly Occupancies.
  - ii) Throughout any building having a total capacity of less than 100 persons.
- 3) Other Plan A Buildings.
  - A) The protection classification of those Plan A buildings not included within the scope of Section 185.320 (a) and (b) shall comply with the requirements of Section 185-320(b)(3).
  - B) Plan A buildings having an open interior arrangement shall comply in full, without deviation, with the protection classification requirements established in Section 185.395(b) and 185.395(c).
  - C) A sprinklered Plan A building with enclosed interior arrangement shall comply with the requirements of Section 185.395(b) except that approved fire detection may be substituted for the required sprinkler protection in those areas specified therein and in those areas specified under Section 185.320(b), provided such areas are located in buildings of Type I, II, III and IV construction; all rooms having a capacity of more than 20 persons are provided with an exterior exit, an approved secondary means of escape, or a separated, secondary path of travel leading to an exterior exit; and all interior stairs and ramps interconnecting basements (if any) with street floors are cut off at either the top or the bottom.

- D) An unsprinklered Plan A building with enclosed interior shall comply with the requirements of Section 185.395(c), except that the fire detection as required therein may also be omitted in those areas specified under Section 185.320(b)(2)(B) provided every room having a capacity of more than 10 persons is provided with an exterior exit, an approved secondary means of escape or a separated, secondary path of travel leading to an exterior exit.
- c) Area and other dimensional limitations
- 1) Plan A Buildings with Direct Exterior Exiting.
    - A) Fire Areas. Fire areas, unlimited in size, shall be permitted for those Plan A buildings having direct exterior exiting with Type I, II, III or IV construction. Fire areas in Type V buildings shall not exceed 10,000 sq. ft. if unsprinklered and 24,000 sq. ft. if sprinklered. The area limitations established in the preceding sentence may be increased 100% when all exterior walls are of noncombustible construction.
    - B) Smoke Areas. Smoke areas unlimited in size shall be permitted for all Plan A buildings with direct exterior exiting.
    - C) Firestopping. Firestopping shall be provided as required under Section 185.390(i), except that the area and dimensional limitations established therein for attics and concealed spaces above ceilings may be increased 150% for buildings with enclosed interior arrangement and 100% for those with open interior arrangement.
  - 2) Other plan A buildings.
    - A) Fire areas. No fire area in those Plan A buildings not included within the scope of Section 185.320(c)(1) shall exceed the limitations established in TABLE A.
    - B) Smoke areas. No smoke area in a corridor or a combination of corridors in a Plan A building with enclosed interior arrangement shall exceed 300 feet in length. No smoke area in an open interior building shall extend in any direction more than 150 feet where such building is unsprinklered or 300 feet where such building is sprinklered.

- C) Firestopping. Firestopping shall be provided in compliance with the requirements of Section 185.390(i) except that the area and dimensional limitations established therein for attics and concealed spaces above ceilings may be increased 100% for buildings with enclosed interior arrangement and 50 % for those with open interior arrangement.

d) Protection of vertical openings

- 1) All vertical openings shall be protected in compliance with the applicable requirements of Section 185.390(c) and Section 185.390(h) unless otherwise specified herein.
- 2) Plan A buildings with direct exterior exiting.

Stairway enclosure protection may be omitted throughout.

- 3) Other plan A buildings. The provisions of Section 185.320 (d) (3) shall apply only to those Plan A buildings which do not have direct exterior exiting.

A) Unsprinklered.

- i) Enclosure protection may be omitted for those interior stairs and ramps interconnecting basement corridors with street floor corridors with an enclosed interior arrangement, provided that every room or space having a capacity of more than 20 persons is provided with an exterior exit, a secondary means of escape-or a separated, secondary path of travel to a separated exterior exit.
- ii) Enclosure protection may be omitted at either the top or the bottom of interior stairs and ramps serving basements which are sprinklered throughout.
- iii) Enclosure protection may be omitted-at the top only of interior stairs and ramps having an enclosed interior arrangement, provided such stairs and ramps open into street floor corridors having an interior finish flame spread rating of not more than 25.

B) Sprinklered.

- i) Enclosure protection may be omitted for interior stairs and ramps interconnecting approved corridors wherein every room or space occupied by more than 40

persons is provided with an exterior exit, a secondary means of escape, or a separated secondary path of travel to a separated exit.

- ii) Enclosure protection may be omitted for interior stairs and ramps wherein the interconnected corridors and/or primary egress aisles including open areas surrounding such aisles have a flame spread rating of not more than 75.
- iii) Enclosure protection may be omitted at either the top or the bottom of all interior stairs and ramps not included within the scope of the preceding two paragraphs.

e) Interior finish

- 1) The-interior finish flame spread rating shall comply with the applicable requirements of Section 185-390(j) unless exception thereto is specifically permitted in Section 185.320 (e).
- 2) An interior finish flame spread rating of not more than 200 shall be permitted for corridors and primary egress aisles located in Plan A buildings without basements, provided every room or space having a capacity of more than 10 persons, if unsprinklered, and 20 persons, if sprinklered, is provided with an exterior exit, a separated secondary path of exit travel or a secondary means of escape.
- 3) Educational Occupancy rooms located on the street floor in those Plan A buildings having an enclosed interior arrangement shall be permitted to have an interior finish flame spread rating of not more than 200, provided every such room having a capacity of more than 50 persons is provided with an exterior exit or a secondary means of escape.

Section 185.330 Plan B Buildings - Multi Story with Direct Exterior Exiting

a) General

- 1) Established in this Section are the specific requirements applicable to all buildings more than one story in height which have direct exterior exiting as defined under Section 185.310(c)(3). Such buildings shall hereinafter be referred to as "Plan B buildings."
- 2) Plan B buildings shall comply with all requirements established in Sections 185.360 through 185.395 of this Subpart unless otherwise specified in this Section.
- 3) In accordance with the provisions of Section 185.310(b) each fire area of each Plan B building shall be classified into one of the five construction types listed and defined under Section 185.390 (b).
- 4) In accordance with the provisions of Section 185.310(d) each fire area of each Plan B building shall be classified as either sprinklered or unsprinklered and shall comply with the applicable provisions of Section 185.395 (b) and 185-395 (c).

b) Height and area limitations

- 1) Height limitations. No Plan B buildings shall exceed the height (number of stories) limitations established in Table B.
- 2) Fire area limitations. No fire area in a Plan B building shall exceed the limitations established in Table C.
- 3) Smoke area limitations. No smoke area in a corridor or in a combination of corridors in a Plan B building with enclosed interior shall exceed 300 ft. in length. No smoke area in an open Interior Plan B building shall extend in any direction more than 150 ft. if such building is unsprinklered or more than 300 ft. if such building is sprinklered. -
- 4) Firestopping. Firestopping shall be provided in compliance with the requirements of Section 185.390(i) except that the area and dimensional limitations established therein for attics and concealed spaces above ceilings may be increased 100% for those Plan B buildings having an enclosed interior arrangement and 50% for those having an open interior arrangement.

c) Protection of vertical openings

- 1) All vertical openings shall be protected in compliance with the applicable provisions of Sections 185.390 (c) and (h) unless exception thereto is specifically permitted in this Section.
- 2) Two-story Plan 8 buildings. Enclosure protection may be omitted throughout.
- 3) Unsprinklered, three-story, Plan B buildings.
  - A) Enclosure protection may be omitted on all stories including basements for those interior stairs and ramps located in Type I, II, III or IV buildings having an enclosed interior arrangement, provided such stairs and ramps have an interior finish flame spread rating of not more than 25 and provided further that -
    - i) Such stairs and ramps interconnect only with those corridors with a flame spread rating of not more than 25 and which are not used as an open plenum; or
    - ii) Such stairs and ramps interconnect only with corridors which are so subdivided on all stories by smoke screens, fire walls or fire partitions that each such stair is located in a separate smoke area.
  - B) In three-story Plan B buildings not covered by the subparagraph (A) preceding, enclosure protection for interior stairs and ramps may be omitted on all floor levels other than unsprinklered basement levels, provided each such stair or ramp interconnects only with corridors or primary egress aisles (including all surrounding areas open to such aisles) having a flame spread rating of not more than 25 and provided further that such corridors and aisles (including adjacent open areas) are so subdivided on all floors by smokescreens or fire partitions that each such stair or ramp is located in a separate smoke or fire area.
- 4) Sprinklered, three-story and four-story Plan B buildings.
  - A) Enclosure protection may be omitted on all stories including basements for those interior stairs and ramps located in a Type I, II, III or IV building, provided such stairs and ramps have an interior finish flame spread rating of not more than 75 and provided further that

- 
- i) Such stairs and ramps interconnect only with corridors which have an interior finish flame spread rating of not more than 75 and which are not used as an open plenum; or
  - ii) Such stairs and ramps interconnect only with corridors which are so subdivided on all stories by smoke screens, fire walls or partitions that each such stair or ramp is located in a separate smoke area.
- B) In sprinklered three- and four-story Plan B buildings not covered by the subparagraph (A) preceding, enclosure protection for interior stairs and ramps may be omitted:
- i) On all floor levels, including the basement level, provided each such stair or ramp interconnects only with corridors or primary egress aisles having a flamespread rating of not more than 75 and such corridors or aisles (including adjacent open areas) are so subdivided by smoke screens or fire partitions that each stair or ramp is located in a separate smoke or fire area.
  - ii) On all floor levels, other than the basement level, provided each such stair or ramp interconnects only with those corridors and primary egress aisles, including all surrounding areas open to such aisles which have a flamespread rating of not more than 25.

Section 185.340 Plan C Buildings - Multi Story with Enclosed Interior

a) General

- 1) Established in this Section are the specific requirements applicable to all buildings more than one story in height which have an enclosed interior arrangement as defined in Section 195.310(c)(2) and which utilize in whole or in part interior exits and/or interior paths of travel leading to exits. Such buildings shall hereinafter be referred to as "Plan C buildings."
- 2) Plan C buildings shall comply with all requirements established in Sections 185.360 through 185.395 of this Subpart unless otherwise specified in this Section.
- 3) In accordance with the provisions of Section 185.310(b) each fire area of each Plan C building shall be classified into one of the five construction types listed and defined under Section 185.390(b).
- 4) In accordance with the provisions of Section 185.310(d) each fire area of each Plan C building shall be classified as either sprinklered or unsprinklered. Fire areas not qualifying for classification as sprinklered under the provisions of Section 185.395(b) shall be classified as unsprinklered and shall comply with the applicable provisions of Section 185.395(c).

b) Height and area limitations

- 1) Height limitations. No Plan C buildings shall exceed the height (number of stories) limitations established in Table D.
- 2) Fire area limitations. No fire area in a Plan C building shall exceed the limitations established in Table E.
- 3) Smoke area limitations. No smoke area in a corridor or a combination of corridors in a Plan C building shall exceed 300 ft. in length.
- 4) Firestopping. Attics and concealed spaces in Plan C buildings shall be fire stopped in compliance with the applicable provisions of Section 185.390(i).

- c) Protection of vertical openings
- 1) All vertical openings shall be protected in compliance with the applicable provisions of Sections 185.390(c) and 185.390(h) unless exception thereof is specifically permitted in this Section.
  - 2) Unsprinklered, two-story Plan C buildings.
    - A) Enclosure protection may be omitted on all stories other than unsprinklered basements for those interior stairs and ramps having an interior finish flame spread rating of not more than 25, which interconnect only with those approved corridors not used as an open plenum chamber, provided-
      - i) Every room having a capacity of more than 10 persons is provided with an exterior exit, a secondary means of escape or a secondary path of travel leading to an interior or exterior exit which is separated throughout its total length from those corridors open to unenclosed stairs or ramps; or
      - ii) Such stairs and ramps are located in a Type I, II, III or IV building and interconnect only with those corridors which have an interior finish flame spread rating of not more than 25 and which are subdivided on all stories (except the basement) by smoke screens, fire walls or fire partitions so that each such stair or ramp is located in a separate smoke area and the distance of travel from any corridor access door to the next smoke area is not more than 100 feet.
    - B) Enclosure protection for any interior stairs or ramps may be omitted on the second floor under any one of the following conditions:
      - i) Where such stairs and ramps and the corridors connected therewith have a flame spread rating of not more than 25.
      - ii) Where every room on the second floor having a capacity of more than 20 persons is provided with an exterior exit or a secondary path of travel leading to an interior or exterior exit, provided such path is separated throughout its total length from corridors or other areas open to the unenclosed stairs or ramps.

- iii) Where each of the involved stairs or ramps enters the second floor corridor in a separate smoke or fire area and the distance of travel in such corridor measured from any access door there into to the next smoke or fire area is not more than 100 ft.
- 3) Sprinklered, two-story Plan C buildings.
- A) Enclosure protection may be omitted on all stories including the basement for those interior stairs and ramps which have a flame spread rating of not more than 75, provided-
    - i) Such stairs and ramps interconnect only with corridors having a flame spread rating of not more than 75; or
    - ii) Such stairs and ramps are located in a building which has been subdivided on all stories by smoke screens, fire walls and fire partitions so that each stair or ramp is located in a separate smoke area; or
    - iii) Every room having a capacity of more than 20 persons is provided with an exterior exit, a secondary means of escape, or a secondary path of travel leading to an interior or exterior exit which is separated throughout its total length from those corridors open to unenclosed stairs or ramps.
  - B) Enclosure protection for all stairs and ramps may be omitted on the second floor of all sprinklered two-story, Plan C buildings.
- 4) Unsprinklered three-story Plan C buildings.
- Enclosure protection may be omitted on all stories other than unsprinklered basements for interior - stairs, ramps, and corridors which have an interior finish flame spread rating of not more than 25 and interconnect only with those corridors not used as an open plenum chamber, provided-
- i) Every room having a capacity of more than 10 persons is provided with an approved exterior exit or a secondary means of escape or with two separated, secondary paths of travel, each leading to an

approved interior or exterior exit, provided such paths are separated throughout their total length from the corridors or other areas open to the stairs or ramps involved, or

- ii) In a Type I, II, III or IV building, having two or more remotely located stairs or ramps, where each stair or ramp interconnects only with those approved corridors which are so subdivided on all floor levels by smoke screens, fire walls, or fire partitions that each stair and ramp is located in a separate smoke area; and provided further that the distance of travel in such corridors from any access door there into to the next smoke area or fire area .is not more than 75 feet.

5) Sprinklered three-story and four-story Plan C buildings.

- A) Enclosure protection for interior stairs and ramps may be omitted on all floor levels, except basement levels, under any one of the following conditions when stairs, ramps and corridors have a flame spread of not more than 75:
  - i) Where every room having a capacity of more than 20 persons is provided with either an approved exterior exit, a secondary means of escape or a secondary path of travel leading to an approved interior or exterior exit, provided such path is separated throughout its total length from those corridors and other areas open to the stairs or ramps involved, or
  - ii) In a Type I, II, III or IV building having two or more remotely located stairs or ramps, where each stair or ramp interconnects only with those approved corridors which are so subdivided on all floor levels by smoke screens, fire walls or fire partitions that each stair or ramp is-located in a separate smoke or fire area, and provided further that the distance of travel in such corridors measured from any access door there into is not more than 100 feet for travel to the next smoke area or fire area.
- B) Enclosure protection for any interior stairs or ramps having a flame spread rating not more than 75 may be omitted on the top floor-

- 
- i) Where every room located on such floor and having a capacity of more than 20 persons is provided with either an exterior exit or a secondary path of travel leading to an interior or exterior exit, provided such path is separated throughout its total length from corridors or other areas open to the stairs or ramps involved, or
  - ii) In a Type I, II, III or IV building having two or more remotely located stairs or ramps, where each of the stairs or ramps involved enters the top floor corridor in a separate smoke or fire area and the distance of travel in such corridor measured from any access door there into to the next smoke or fire area is not more than 100 ft.

Section 185.350 Plan D Buildings - Multi Story with Open Interior

a) General

- 1) Established in this Section are the specific requirements applicable to all buildings more than one story in height which have an open interior arrangement as defined in Section 185.310(c)(2) and do not qualify for classification as a Plan B building (direct exterior exiting.) Such buildings shall hereinafter be referred to as "Plan D buildings."
- 2) Plan D buildings shall comply with all requirements established in Section 185.360 through 185.395 of this Part unless otherwise specified in this Section.
- 3) In accordance with the provisions of Section 185.310(b) each fire area of each Plan D building shall be classified into one of the five construction types listed and defined under Section 185.390(b).
- 4) In accordance with the provisions of Section 185.310(d) each fire area of each Plan D building shall be classified as either sprinklered or unsprinklered. Fire areas not qualifying for classification as sprinklered under the provisions of Section 185.395(b) shall be classified as unsprinklered and shall comply with the provisions of Section 185.395(c).

b) Height and area limitations

- 1) Height limitations. No Plan D building shall exceed the height (number of stories) limitations established in Table F.
- 2) Fire area limitations. No fire area in a Plan D building shall exceed the limitations established in the Table G.
- 3) Smoke areas. No smoke area in a corridor or a combination of corridors in Plan D buildings shall exceed 125 ft. in length when unsprinklered and 250 ft. when the building is sprinklered.
- 4) Firestopping. Attics and concealed spaces in Plan D buildings shall be fire stopped in compliance with the applicable provisions of Section 185.390(i).

c) Protection of vertical openings

- 1) All vertical openings shall be protected in compliance with the applicable provisions of Sections 185.390(c) and (h) of this Part unless exception thereto is specifically permitted in this Subsection.

2) Unsprinklered, 2-story Plan D buildings.

Enclosure protection for interior stairs and ramps may be omitted on all floor levels other than basement levels under any one of the following conditions when the flame spread rating of the corridors, aisles (including all surrounding areas open to such aisles) is not more than 25:

- i) Where every room or space having a capacity of more than 10 persons is provided with either an approved exterior exit or a secondary means of escape or with two separated, secondary paths of travel each leading to an approved interior exit door (provided such paths are in addition to and separated throughout their total length from the corridor or primary egress aisle serving as the required primary paths of exit travel from the rooms involved.)
- ii) In a Type 1, II, III or IV building where each stair or ramp interconnects only with those approved corridors or primary egress aisles (including all surrounding areas open to such aisles) which are so subdivided by smoke screens, fire walls or fire partitions that each such stair or ramp is located in a separate smoke area and the distance of travel measured from any point to the next fire or smoke area is not more than 100 ft.

3) Sprinklered, 2-story Plan D buildings.

A) Enclosure protection for any interior stairs or ramps may be omitted on all floor levels other than basement levels under any one of the following conditions when the flame spread rating is not more than 75 throughout:

- i) Where such stairs or ramps interconnect approved corridors or primary egress aisles, or
- ii) Where every room having a capacity of more than 20 persons is provided with an exterior exit, a secondary means of escape, or a secondary path of travel to an interior or exterior exit (provided such path is separated throughout its total length from the corridors or primary egress aisles which serve as the required primary path of exit travel from the rooms involved), or

- 
- iii) Where each of the stairs or ramps involved is located in a separate smoke or fire area and the distance of travel measured from any occupiable point to the next fire or smoke area is not more than 125 ft.
  - B) Enclosure protection for all interior stairs and ramps may be omitted on the second floor of all sprinklered two-story Plan D buildings.
- 4) Sprinklered, 3-story Plan D buildings. Enclosure protection for interior stairs and ramps may be omitted on all floor levels other than the basement levels under any one of the following conditions when the flame spread rating is not more than 75 throughout:
- A) Where every room having a capacity of more than 20 persons is provided with either an approved exterior exit, a secondary means of escape or a secondary path of travel leading to an approved interior or exterior exit (provided such path is separated throughout its total length from those corridors and primary egress aisles which serve as the primary path of exit travel from the rooms involved).
  - 8) In a Type I, II, III or IV building where each stair or ramp interconnects only with those approved corridors or primary egress aisles (including all surrounding areas open to such aisles) which are so subdivided by smoke screens, fire walls or fire partitions that each such stair or ramp is located in a separate smoke area and the distance of travel measured from any occupiable point to the next fire or smoke area is not more than 100 ft.

Section 185.360 Specific Requirements - Assembly Occupancies

a) Scope

- 1) The requirements established in this Section shall apply to all rooms or spaces classified as a Class A, B or C Assembly Occupancy as defined under Section 185.310(e)(4).
- 2) All Assembly Occupancies shall comply with the applicable requirements of Sections 185.370 through 185.395 of this Part unless otherwise specified herein and in Sections 185.320 through 185.350 of this Part.

b) General restrictions and rules

- 1) Location restrictions.
  - A) Unprotected vertical openings shall not be permitted between a Assembly Occupancy and the floors above or below.
  - B) No Assembly Occupancy shall be located directly above any unsprinklered Special Educational, Storage or Mechanical Occupancy room or space unless separated therefrom by a floor assembly having not less than one hour fire resistance rating. (Concrete pan construction with 2 1/2" minimum floor thickness or wood joists with metal lath and plaster is acceptable).
  - C) No Class A Assembly Occupancy shall be located in the basement of an unsprinklered building unless all exits (and required paths of travel to such exits) are separated from the remainder of the basement in such a manner as to prevent heat, smoke and gases caused by a fire in the remaining basement area from rendering such exits (and the paths of travel thereto) unusable.
  - D) No Class 8 or C Assembly Occupancy shall be located in the basement of an unsprinklered building unless at least 75% of the capacity of the Assembly Occupancy involved is through exits (and the paths of travel thereto) which are separated in compliance with the requirements of the foregoing paragraph.
  - E) No Class A or 8 Assembly Occupancy shall be located above the street floor of any building having one or more unenclosed stairs, ramps or other vertical openings (where such are permitted under this Part), unless all

required exits (and paths of travel thereto) for the involved Assembly Occupancy are separated from such stairs, ramps and other vertical openings in such a manner as to prevent heat, smoke or gases rising within these openings from rendering such exits (and the paths of travel thereto) unusable.

- F) EXCEPTION: Class A or B Assembly Occupancies located on the second floor of sprinklered, Type I, II, III and IV buildings having one or more unenclosed stairs, ramps or other vertical openings shall be permitted, provided that not less than 50% of the capacity of each such occupancy is through exits (and the paths of travel thereto) which are separated in compliance with the requirements of the foregoing paragraph.

2) Places of outdoor assembly.

- A) All grandstands, tents and other places of outdoor assembly shall comply with the requirements of NFPA 102-1957, except as hereinafter specified.
- B) Where the space beneath permanent grandstands or other similar spaces of outdoor assembly are used by pupils for educational, recreational or other purposes, such spaces shall be so constructed and maintained as to comply with the requirements of this Part applicable to their use.
- C) Bleachers and other seating used in places of outdoor assembly shall comply with the applicable provisions of Subpart H.

c) Exit requirements

1) Capacity.

- A) The population capacity of Assembly Occupancy rooms or spaces shall be determined in compliance with the procedures established under Section 185.310(f)
- B) Where exits and required paths of travel thereto serve both an Assembly Occupancy and other occupancies located on the same floor, such exits and the paths of travel thereto shall have sufficient capacity to serve the sum of the population capacities of the Assembly Occupancy and the other occupancies served thereby, except where conditions are such that the simultaneous occupancy thereof will not occur.

- 2) Number and location of exits.
  - A) Every Assembly Occupancy and every occupied tier, balcony or space therein shall have exits sufficient to provide for the total capacity thereof.
  - B) Every Class A Assembly Occupancy shall be provided with not less than four exit or egress doorways, located as remote from each other as is practical. Such doorways shall lead directly to at least three separated paths of exit travel.
  - C) Every Class B Assembly Occupancy shall be provided with not less than three exit or egress doorways, located as remote from each other as is practical. Such doorways shall lead directly to at least two separated paths of exit travel.
  - D) Every Class C Assembly Occupancy shall be provided with not less than two doorways, located as remote from each other as is practical. Such doorways shall lead directly to at least two separated paths of exit travel.
  - E) Not more than 60% of the total capacity of any Assembly Occupancy shall exit through one exit or one smoke area.
  - F) Not more than 25% of the total capacity of any Assembly Occupancy shall be permitted to pass through a stage or kitchen area enroute to a required exit.
- 3) Distance of exit travel. The distance of exit travel for Assembly Occupancies shall not exceed the limitations established under Section 185.370(d)(4) subject to the following allowable exceptions:
  - A) For Class A and B Assembly Occupancies located in a sprinklered building or on the street floor of an unsprinklered building of Type I, II, III and IV construction, the base distance of exit travel figures as established in Section 185.370(d)(4) may be increased to 175 ft. for the sprinklered building and 150 ft. for the unsprinklered building.
  - B) For Class A and 8 Assembly Occupancies located in the basement or on the second floor of an unsprinklered building of Type I, II, III or IV construction, the base distance of exit travel figures as established in Section 185.370(d)(4) may be increased to 125 ft.

- 4) Types of exits and paths of travel to exits.
- A) Exits serving Assembly Occupancies shall comply with the applicable provisions of Section 185.370 of this Subpart subject to the restrictions established under this Section.
  - B) Class C exit stairs, Class C exit ramps, Class C fire escapes, and slide escapes of any type shall not be permitted as a required exit for any Assembly Occupancy.
  - C) All interior stairs and ramps serving as means of exit for an Assembly Occupancy shall be enclosed in compliance with Section 185.390(h)(2) unless the omission of such enclosure is specifically permitted under Sections 185.320 through 185.350 of this Part. The omission of such enclosure shall further be limited by the restrictions established under Section 185.360(b)(1)(E).
  - D) Every occupied tier or balcony located in an Assembly Occupancy room or space having a capacity of more than 20 persons shall have direct access to not less than 2 exits, 2 primary paths of travel to exits or 2 stairs or ramps leading therefrom to the main assembly floor. Stairs and ramps between balconies or tiers and the main assembly floors shall not be required to be enclosed but shall comply with the other dimensional and construction requirements established for interior exit stairs and ramps under Sections 185.370 (c) and (d). Such stairs and ramps shall be of sufficient width to serve the total capacity required to travel thereon enroute to exits located on the main assembly floor level, but in no case shall the width of such stairs or ramps be less than 36 in.
- 5) Doors and doorways.
- A) Every door serving as part of a required exit or path of travel thereto for an Assembly Occupancy shall swing in the direction of exit travel and shall be equipped with hardware in compliance with the requirements of Section 185.370(m)(7).
  - B) All exterior and interior doors located in the walls or partitions enclosing an Assembly Occupancy shall comply with the requirements established for exterior exit and interior exit doors under Section 185.370(m) except that

those doors which do not serve as a part of a required exit or path of travel thereto shall comply with the opening protection requirements applicable to the fire resistance rating of the enclosing wall in accordance with the requirements of Section 185.390(g). In any event, all doors shall be of the self-closing type.

- 6) Access to exit or egress doorways. Every Assembly Occupancy shall be so arranged and maintained as to assure safe and reliable paths of travel to require exit egress doorways with such paths of travel extending to such doorways from the most remote points subject to human occupancy. Such paths of travel and the arrangement and types of aisles, ceiling bleachers, benches, etc., shall comply with the applicable requirements of Section 185.380(b)(2) and Subpart H of this Part.
  - 7) -Exit lighting and signs.
    - A) Doorways serving as part of a required means of exit travel from an Assembly Occupancy shall be identified by exit signs in compliance with the applicable provisions of Section 185.370(a) and Subpart E.
    - B) Emergency lighting shall be provided as required under Section 185.370(a)(4) and Subpart E.
- d) Construction requirements
- 1) Occupancy separation.
    - A) Every Assembly Occupancy shall be fully separated from the remainder of the building by occupancy separating walls and partitions complying with the applicable provisions of Section 185.390(g)(4).
    - 8) All storage and Mechanical Occupancies, dressing rooms, work rooms and projection rooms which are located within the enclosing walls of an Assembly Occupancy or immediately adjacent thereto shall be separated from the remainder of the Assembly Occupancy by construction having a fire resistance rating of not less than 30 minutes where such rooms or spaces are unsprinklered and by noncombustible or 30-minute rated construction if such rooms or spaces are sprinklered. Doors providing access into such rooms or spaces shall be of hollow metal or solid core wood construction and shall be maintained locked at all times when such rooms are not in actual use or shall be provided with automatic self-closing devices.

- C) Where the space beneath a stage is used for storage, such space shall be separated from the remainder of the Assembly Occupancy by construction complying with the requirements of the preceding paragraph except that no rating shall be required for the stage floor construction immediately above such spaces. Such spaces shall be sprinklered or provided with approved fire detection in compliance with the requirements of Section 185.360 (e).
  - 2) EXCEPTION: Where the space beneath a stage is used both for storage purposes and as a plenum chamber with grilled openings into the general assembly area, such space shall comply with one of the following:
    - A) All storage in such space shall be removed; the space sealed so that the possibility of future storage is eliminated; and the space protected by an approved sprinkler or fire detection system in compliance with the provisions of Section 185.360 (e).
    - B) All grilled or other air openings between such space and the assembly area shall be protected by approved fire doors or dampers so installed as to close automatically upon the actuation of the building's fire alarm system; the space otherwise separated from the remainder of the Assembly Occupancy in compliance with the requirements set forth above; and the space protected by either an approved sprinkler system or fire detection system in compliance with the requirements of Section 185.360(e).
    - C) The space shall be sprinklered throughout and the fan controlling air movement through such space shall be provided with approved controls so installed as to automatically stop such fan upon actuation of the building's fire alarm system in compliance with the provisions of Section 185.390(e)(3) (no other protection for grilled openings required under this alternative).
    - D) The plenum chamber condition removed by the installation within the space of approved ducts; the space separated from the remainder of the Assembly Occupancy room in compliance with the requirements set forth above; and the space protected by either an approved sprinkler system or fire detection system in compliance with the requirements of Section 185.360(e).
- e) Stages

- 1) Every stage located in a Class A or B Assembly Occupancy which is equipped with fly galleries, gridirons and rigging for movable theater-type scenery shall be protected by sprinklers. Such protection shall also be provided in auxiliary spaces such as dressing rooms, storerooms and workshops. The proscenium opening shall be provided with a noncombustible or flame proofed curtain. Doors in the proscenium wall shall be of the self-closing type and of metal or solid core wood construction.
- 2) EXCEPTION: In a building or fire area with "unsprinklered" protection classification, approved fire detection may be substituted for the sprinkler protection in such stages, provided:
  - A) The proscenium opening is protected by an automatic, self-closing, fire-resisting curtain capable of withstanding a lateral pressure of 10 psf over the entire area, and
  - B) The stage roof is provided with ventilators, manually operable from the stage floor and automatically operable by fusible links or other approved heat actuated devices. Such ventilators shall have a free opening equal to at least 1/8th the area of the floor of the stage.
- 3) Other stages.
  - A) Requirements of this Section shall apply to all stages not falling within the scope of Section 185.360(e)(1).
  - 8) Unenclosed platform-type stages (stages without proscenium wall and opening) shall be excluded from any special protection requirements except for those applicable to under-stage spaces as set forth under Section 185.360(d)(1)(C). Such stages, however, shall be so arranged and constructed as to avoid introducing any conditions which unnecessarily jeopardize life safety and shall have fire detection if not sprinklered.
  - C) Every stage having a proscenium wall and opening shall comply with the requirements established for theatre-type stages, as set forth in Section 185.360 (e)(1), except that fire detection may be substituted for the required sprinkler protection for stages located in unsprinklered buildings. Under stage spaces shall comply with the applicable provisions of Section 185.360(d)(1)(C).

- 
- f) Interior finish and decorative materials
- 1) The flame spread rating of the interior finish of Assembly Occupancy shall comply with the applicable provisions of Section 185.390(j) but in no case shall such rating exceed the following:
    - A) 75 for the ceilings and walls of all unsprinklered Assembly Occupancies.
    - B) 75 for the ceilings and 200 for the walls of all sprinklered Assembly Occupancies except that a ceiling flame spread rating of not more than 200 shall be permitted for sprinklered Class C Assembly Occupancies.
  - 2) All decorative materials located in an Assembly Occupancy room (including draperies, curtains, cloth hangings, etc.) shall be noncombustible or flame proofed in accordance with the provisions of Section 185.390(k).
  - 3) Combustible scenery and display of a major nature shall be treated with fire retardant coating or flame proofed in such a manner as to reduce the flammability to an effective and safe minimum.

Section 185.370 Exit Requirements and Details

- a) General rules of exiting
  - 1) The general rules and requirements established in this Section shall apply to all buildings and portions thereof unless specific exception thereto is provided under Section 185.320 through 185.360 of this Subpart.
  - 2) Terms used in this Section shall have the meaning as defined in Section 185.220. Where reference is made to an "exit" or to "primary and secondary paths of travel," such shall refer to those which comply with the applicable provisions of Section 185.370(b) through 185.370(m) and Section 185.380 (a) through 185.380(d), respectively.
  - 3) The capacity for any floor, room or space, established in accordance with the provisions of Section 185.310(f) and 185.310(g), shall not exceed the capacity of the exits and paths of travel thereto which serve the floor, room or spaces under consideration.
  - 4) Distance of exit travel.
    - A) The distance of exit travel, as defined in Section 185.220 shall be measured along the floor at the center line of the natural path of travel. Measurement shall start one foot from the inside wall at the most remote point in the room or space under consideration; shall curve around any corners or obstructions with a one foot clear radius; and shall end at the center of the exit doorway.
    - B) In those cases where unenclosed stairs and ramps are permitted as part of a required primary path of travel to an exit, the distance of travel down such stairs and ramps and from the bottom thereof to the nearest exit doorway shall be included in establishing the distance of exit travel. The distance of travel down stairs and ramps shall be measured along the center line thereof in a straight line in the direction of the pitch of such stairs and ramps.
    - C) Exits and the primary paths of travel thereto shall be so arranged that the distance of exit travel from the most remote spot in every occupied room or space is not more than 150 ft. where the room or space under consideration is located on the street floor of an unsprinklered

building or fire area; 125 ft. where the room or space under consideration is otherwise located in an unsprinklered building or fire area; and 175 ft. where the room or space under consideration is located in a sprinklered building or fire area. The distance limitations herein established are base figures for all buildings, except as otherwise permitted for certain Assembly Occupancies under Section 185.360(c)(3). Base figures, as set forth herein, are subject to the increases allowed in the following paragraph.

- D) Where the path of travel to the nearest exit from a room or space includes travel through a corridor, which complies with the requirements of Section 185.380(c) and which leads directly to the exit under consideration, the base distance of exit travel figures established in the preceding paragraph may be increased one foot for every foot of travel in such a corridor, provided, however, that the resulting increase shall not exceed 50 feet for travel in those corridors located in an unsprinklered building which have a ceiling flame spread rating of more than 25, or 75 ft. for travel in all other corridors. Corridor travel shall, in addition to horizontal travel therein, include travel down unenclosed or partially enclosed stairs and ramps as defined under Section 185.380(c)(3).
- 5) Number of exits and paths of travel thereto.
- A) Exits shall be so located and arranged that not less than two exits, located as remote from each other as practical and readily accessible via approved paths of travel, are available from every occupied story and basement of each fire area. Where unenclosed or partially enclosed interior stairs or ramps are permitted under this Part, the availability of not less than two such stairs or ramps shall be considered to comply with the foregoing requirements, provided the distance of exit travel (including the travel distance down such stairs or ramps) does not exceed the limitations established in Section 185.370(a)(4) and the stairs or ramps comply with the requirements of Section 185.380(c)(3).
  - B) Assembly Occupancy rooms or spaces shall comply with the exit requirements established under Section 185.360(c).
  - C) Every room or space having a capacity of more than 10 persons in an unsprinklered building or 20 persons in a sprinklered building shall be provided with access to two

---

exits via approved paths of travel. Any arrangement of exits and paths of travel to exits described below shall be considered to comply with the foregoing requirement.

- i) One exterior exit doorway providing direct access to the ground level outside or indirect access thereto by means of an exterior stair or ramp not more than five feet in height.
- ii) One exterior exit doorway which provides direct access onto an exterior balcony or areaway which leads in opposite directions to separate approved means of ascent or descent to ground level.
- iii) One interior exit doorway providing direct access into a fire resistive passageway which leads to an exit or place of safe refuge except that when the distance of travel in such passageway to the exit or place of safe refuge is more than 100 ft., travel in opposite directions to approved exits or places of safe refuge shall be required.
- iv) One interior doorway providing direct access into a corridor or primary egress aisle which leads in opposite directions to separate exits.
- v) Any exterior doorway in combination with any interior exit doorway.
- vi) Any exterior exit doorway in combination with any interior doorway providing direct access into a corridor or primary egress aisle which leads to an exit.
- vii) Any two interior exit doorways providing access into separate exits or separate places of safe refuge.
- viii) Any interior exit doorway in combination with any interior doorway providing direct access into a corridor or primary egress aisle which leads to a separate exit.
- ix) An interior doorway providing access to a secondary path of egress travel leading to an exit, as provided for under Section 185.380(b)(4) and 185.380(b)(5) in combination with an exterior exit, interior exit, or interior corridor or egress aisle access doorway which, by reason of its arrangement,

qualifies as a single exit or path of travel to an exit only.

- x) An interior exit doorway providing direct access into a single directional (dead-end) corridor subject to the limitations established thereof under Section 185.380(e)(9).
  - xi) Two interior doorways providing direct access into separated secondary paths of exit travel leading to separated exits. This arrangement, however, shall be considered as acceptable for only those rooms or spaces having a capacity of not more than 20 persons in an unsprinklered building and 30 persons in a sprinklered building.
- D) Every room or space having a capacity of not more than 10 persons in an unsprinklered building or 20 persons in a sprinklered building shall have direct access to an exit or indirect access thereto via an approved primary or secondary path of travel. Travel through an adjacent occupied room or space enroute to the required exit or primary path of travel thereto shall be permitted.
- E) Every room or space having a capacity of more than 60 persons or having an area of more than 1,200 sq. ft. shall comply with the foregoing requirements of this Section but shall have not less than two doorways providing direct access to the required exits or paths of travel leading thereto. Such doorways shall be located as remote from each other as practical.
- 6) Identification and illumination of exits.
- A) The illumination and identification of exits and required paths of travel thereto shall comply with the provisions of this Section and Subpart E of this Part.
  - B) Illuminated exit signs shall be provided-over--
    - i) Every exterior exit doorway serving as a required means of exit travel from an Assembly Occupancy room or space; or from any corridor, primary egress aisle, interior stair, interior ramps, and fire resistive passageway which serves as required means of exit travel for more than 200 persons.
    - ii) Every exterior exit doorway leading to fire escapes or slide escapes which serves as required means of exit for more than 60 persons.

- iii) Every interior exit doorway which functions as part of a required horizontal exit or which serves as the means of access into exit stairs, exit ramps and fire resistive passageways.
  - iv) Every other interior doorway which is located in a required primary path of exit travel from an Assembly Occupancy room or space.
- C) Emergency lighting complying with the provisions of Section 185.570 shall be provided for all Assembly Occupancies including all exits and paths of exit travel required for such occupancies and for all basement corridors and primary egress aisles which serve as a required means of exit travel for more than 200 persons.

EXCEPTION: Subject to the approval of the Enforcing Authority, emergency lighting may be omitted for those Class C Assembly Occupancies and their required exits and paths of exit travel, which are not subject to night-time usage provided such occupancies and their required exits and paths of exit travel thereto are adequately illuminated by natural light.

b) Approved exits

- 1) An "exit" or "means of exit," as defined in Section 185.220 and whenever referred to in this Part, shall comply with the applicable provisions of this subsection and Section 185.370(c) through 185.370(n) unless specific exception thereto is provided elsewhere in this Part.
- 2) An exit shall be considered to start at the exit door providing entry there into and to extend continuously there from to point of discharge into an approved place of safe refuge. In the case of an exterior exit door leading directly to a place of safe refuge on the outside or an interior or exterior exit door qualifying as a horizontal exit, the door itself shall constitute the exit.
- 3) An exit throughout its total length shall consist of one or more of the following:
  - A) An interior exit stair (Section 185.370(c))
  - B) An interior exit ramp (Section 185.370(d))

- C) A fire resistive passageway (Section 185.370(e))
- D) A horizontal exit (Section 185.370(g))
- E) An exterior exit leading directly to a place of safe refuge at ground level (Section 185.370(f))
- F) An exterior exit door leading to and combined with--
  - i) Approved outside stairs or ramps (Section 185.370(i))
  - ii) A smokeproof tower (Section 185.370(h)) via an exterior balcony or landing.
  - iii) A fire escape (Section 185.370(k) or slide escape (Section 185.370(l)).
  - iv) An exterior balcony or approved roof walk-way leading to and combined with approved stairs, fire escapes and other means of ascending or descending therefrom to ground level. (Section 185.370(j))
- 4) No means of travel to a place of safe refuge, even though such is protected or listed in Section 185.370(b)(3) above, shall be approved for use as a required exit under this Part unless such--
  - A) Is so located and arranged as to be readily accessible with clearly distinguishable paths of travel leading thereto at all times when the building is occupied;
  - B) Is free of obstructions of either a temporary or permanent nature which reduce the clear width below the specified minimum or otherwise affect the capacity of safe use thereof;
  - C) Has a minimum head room of not less than 8 ft. with the clear height of any doors or other obstruction located in the path of travel to a place of safe refuge not less than 6 ft. 6 in.
  - D) Has a firm and safe floor surfacing free from any irregularities or other qualities which would increase unnecessarily the possibility of tripping, stumbling, or falling;

- E,) Is maintained in a clean condition free of combustible contents. No trash collection receptacles shall be permitted on stairs, landings, or within any protected exit;
  - F) Is structurally sound throughout its entire length of travel with all physical segments thereof constructed as an integral part of the building or permanently and firmly affixed thereto;
  - G) Is used as a normal path of exiting during standard fire drills;
  - H) Is protected against or free from any internal or external exposures of a hazardous, damaging and interruptive nature. Such shall be construed to prohibit the location of gas meters and valves, air compressors or other high-pressure equipment within or directly beneath a required exit; and further to prohibit the storage or use of flammable liquids, compressed gases and other highly hazardous or explosive material within or directly beneath any required exit;
  - I) Leads to a place of safe refuge which is adequately protected against the effects of the fire or explosion occurrence involved and which provides a reliable, adequately sized, and obvious means of travel therefrom to the street or to an open yard area of adequate size.
- c) Interior exit stairs
- 1) Interior stairs serving as a required means of exit for one or more floors above or below a street floor shall comply with the requirements of this subsection and shall be referred to as "interior exit stairs."
  - 2) All interior exit stairs shall be fully enclosed in compliance with the applicable requirements of Section 185.390(h) with doorways into such enclosures complying with Section 185.370(c)(11).
  - 3) All interior exit stairs shall lead directly to approved exterior exit doors or indirectly thereto by means of a fire resistive passageway. Where this is not practical, an existing exit stairway may lead to a vestibule enclosed as required for the stairway and provided with separate doors into separated means of egress.

- 4) All interior exit stairs shall be illuminated during all periods when the building served thereby is occupied in accordance with the applicable provisions of Section 185-370 (a)(6) and Subpart E of this Part.
- 5) All interior exit stairs shall be protected against the exposure effects of fires and explosions in nearby or interconnecting buildings.
- 6) Width of interior exit stairs.
  - A) No interior exit stair shall be less than 30 inches in clear width.
  - B) The unit of exit width for interior exit stairs shall be 18 in. as defined in Section 185.220 (b). An inward projection of 3 1/2 in. on each side of an exit stair for handrails shall be permitted without a penalty effect on the number of units of exit width.
- 7) Stair classification and limitations.
  - A) Interior exit stairs shall be divided into three classes, Class A, B and C, depending upon their compliance with the dimensional and other limitations established in Section 185.370 (c)(9) hereof.
  - B) Class C stairs may be used as required means of exit only where specifically approved by the Enforcing Authority.
- 8) Capacity of interior exit stairs.
  - A) The capacity of either Class A or Class B interior exit stairs shall be 80 persons per unit of exit width.
  - B) The capacity of Class C stairs shall be 45 persons per unit of exit width where serving as means of exit for only one story and 30 persons per unit of exit width where serving as means of exit for more than one story.
  - C) The same units of exit stair width, or fraction thereof, required for any individual floor above the street floor may be considered as being simultaneously available for exit use by all other floors located above the street floor, which are served by the same exit stair.
- 9) Dimensional and definitive limitations-Class A, B, and C exit stairs are given in Appendix A, Table H.

- 10) Design and arrangement details.
- A) Interior exit stairs, including platforms and landings, shall be constructed of noncombustible materials subject to the following allowable alternates:
    - i) Combustible materials shall be permitted provided such are so protected on the underside as to provide not less than 45 minute fire resistance ratings in unsprinklered buildings. No fire resistance rating shall be required in sprinklered buildings provided the entire underside of such stairs has a flame spread rating of not more than 25.
    - ii) Wood treads may be permitted for stairs of otherwise noncombustible construction provided such are of solid plank construction with nominal thickness of not less than 2 in.
  - B) All treads of interior exit stairs shall be solid (without perforations).
  - C) All interior stairs including platforms, landings, balconies and stair floors, shall be designed to carry a load of 100 psf or a concentrated load of 300 lbs. so located as to produce maximum stress conditions.
  - D) No variation exceeding-3/16 in. shall be permitted in the width of treads or in the heights of risers in any flight, except as permitted under Section 185.370 (c)(9).
  - E) All treads less than 10 in. wide shall have a nosing or an effective projection of approximately 1 in. over the level immediately below.
  - F) No arrangement of treads known as winders shall be permitted in stairways, except as otherwise permitted under Section 185.370 (c)(9).
  - G) The surfacing of stair treads and landings shall be such as to minimize the danger of slipping or tripping.
  - H) The space beneath any interior exit stairs shall be left entirely open or be completely enclosed by not less than one hour construction. No doors or other openings shall be permitted in such enclosure except that, where such

enclosed spaces are sprinklered, one opening there into shall be permitted provided such opening is protected by a self-closing, Class B fire door. This provision shall not be construed to prohibit a flight of stairs or a ramp beneath another flight of stairs or a ramp.

11) Doorways and doors.

- A) Interior doorways providing access into interior exit stairway enclosures from Educational Occupancies, Assembly Occupancies, corridors and primary egress aisles shall be not less than a 45-minute fire resistance rating. (See Section 185.390 (h)(2)). Doorways from Special Education, Storage or Mechanical Occupancy rooms or spaces into stairway enclosures shall have not less than one hour fire resistance rating, and no hold-open devices will be permitted.
- B) No door shall be permitted to open immediately onto an exit stair. A landing at least as wide as the entrance door shall be provided.
- C) Interior exit stair doors shall further comply with the provisions of Section 185.370 (m).

12) Handrails and balustrades.

- A) All interior exit stairs shall have walls or well-secured balustrades. The open edges of adjoining stair landings, balconies or platforms shall be suitably guarded by extension of the stair rail along the open edge, and the provision of intermediate rails or screens to protect the space under the rail.
- B) All interior exit stairs more than 36 in. width shall have handrails on both sides. All Class A or B stairs 88 in. or more in width and Class C stairs over 66 in. in width shall be provided with one or more - substantially supported intermediate handrails. The number and position of intermediate handrails shall be such that there will be not more than 66 in. between adjacent handrails except as otherwise permitted in the preceding sentence.
- C) Handrails on stairs shall be not less than 30 in. nor more than 42 in. above the upper surface of the tread, measured vertically to the top of the rail from a point

on the tread in line with the face of the riser at its outside edge. On stairs designed for use by small children a lower handrail shall be provided where the main handrail is above 36 in.

- D) A clearance of not less than 1 1/2 in. shall be provided between a handrail and the wall or surface to which it is fastened.
- E) Handrails shall be of such design and so supported as to withstand a load of 200 lbs. applied at any point, downward or horizontally.

d) Interior exit ramps

- 1) Interior ramps serving as required means of exit for one or more floors above or below a street floor shall comply with the requirements of this Section and shall be referred to as "interior exit ramps."
- 2) Interior exit ramps shall comply with the requirements for interior exit stairs set forth in Section 185.370 (c)(2) through 185.370 (c)(5) unless otherwise specified herein.
- 3) Ramp classification and limitations.
  - A) Interior exit ramps shall be divided into three classes, Class A, B and C, depending upon their compliance with the dimensional and other limitations established in Section 185.370 (d)(6).
  - B) Class C ramps may be used as required means of exit only when specifically approved by the Enforcing Authority.
- 4) Width of interior exit ramp.
  - A) No interior exit ramp shall be less than 44 in. in clear width except where a Class C ramp is approved for use and a lesser dimension is thereby permitted under Section 185.370 (d)(6).
  - B) The "unit of exit width" for interior exit ramps shall be 18 in. as defined in Section 185.220. An inward projection of 3 1/2 in. on each side of an exit ramp for handrails shall be permitted without a penalty effect on the number of units of exit width.
- 5) Capacity of ramps.

- A) The capacity of Class A ramps shall be 100 persons per unit of exit width.
  - B) The capacity of Class B and C ramps shall be 80 persons per unit of exit width.
  - C) The same units of exit width, or fraction thereof, required for any individual floor above the street floor served by an exit ramp may be considered as being simultaneously available for exit use by all other floors located above the street floor, which are served by such ramp.
- 6) Dimensional and definitive limitations-Class A, B, and C ramps.
- Appendix A Table I provides the dimensional and definitive limitations for each class of exit ramps.
- 7) Design and arrangement details.
- A) All interior ramps including platforms and landings shall be constructed of noncombustible materials.  
  
EXCEPTION: Combustible materials shall be permitted provided such are so protected on the underside as to provide not less than 45 minute fire resistance rating in unsprinklered buildings. No fire resistance rating shall be required in sprinklered buildings provided the entire underside of such ramps has a flame spread rating of not more than 25.
  - B) All ramp floors shall be solid without perforations and constructed of acceptable non-slip materials.
  - C) All ramps, platforms landings, balconies and ramp hallway floors shall be of sufficient strength to sustain safely a live load of not less than 100 psf or a concentrated load of 300 lbs. so located as to provide maximum stress conditions.
  - D) No variation in pitch in any individual ramp surface shall be permitted except that a variation, not to exceed 1% in pitch on opposite sides of the ramp, may be permitted where necessary to provide proper adjustment to the grade of floors and landings.

- E) All ramps shall be straight on any individual ramp section and changes in direction, if any, provided by means of level landings unless otherwise specifically approved by the Enforcing Authority.
  - F) The space beneath any interior exit ramp shall be left entirely open or be completely enclosed by not less than one hour construction. No doors or other openings shall be permitted in such enclosure except that, where such enclosed space is sprinklered, one opening there into shall be permitted provided it is protected by a self closing Class B fire door. This provision shall not be construed to prohibit a flight of stairs or a ramp beneath another flight of stairs or a ramp.
- 8) Doorways and doors. Doorways and doors leading into or from an interior exit ramp shall comply with the provisions applicable to interior exit stairs as established in Section 185.370(c)(11) and Section 185.370 (m).
- 9) Railings
- A) All exit ramps shall have walls or well secured balustrades or guards on both sides. Ramps with slope steeper than 1 in 12 (8 1/3%) shall have handrails on both sides. All Class B ramps, 88 in. or more in width, and Class C ramps more than 66 in. in width shall be provided with one or more continuous intermediate handrails substantially supported; the number and positions of intermediate handrails to be such that there will not-be more than 66 in. between adjacent handrails.
  - B) Handrails on ramps shall be not less than 30 in. nor more than 34 in. above the floor surface of the ramp, measured vertically.
  - C) A clearance of not less than 1 1/2 in. shall be provided between a handrail and the wall to which it is fastened.
  - D) Handrails shall be of such design and so supported as to withstand a load of 200 lbs. applied at any point, downward or horizontally.
  - E) Where not enclosed by walls or balustrades, the open edge of adjoining landings, balconies or platforms to ramps shall be suitably guarded by extension of the ramp rail along the open edge, and the provision of intermediate rails or screen construction to guard the space under the rail.

- e) Fire resistive passageways
- 1) Passageways complying with the provisions of this subsection shall be acceptable for use as a required exit and shall hereinafter be referred to as "fire resistive passageways."
  - 2) Fire resistive passageways shall lead directly to an approved exterior exit doorway providing access to a place of safe refuge on the outside or to approved interior exit doorways providing direct access into interior exit stair or ramp enclosures.
  - 3) Fire resistive passageways shall comply with all of the requirements established in Section 185.380 (c) for corridors except in those instances where the requirements of this Section are more restrictive.
  - 4) Construction.
    - A) Fire resistive passageways located in unsprinklered basements or in unsprinklered buildings more than two stories in height shall be completely enclosed by construction having a fire resistance rating not less than one hour. (Concrete pan floor construction with 2 1/2" minimum thickness or wood joists with metal lath and plaster is acceptable.)
    - B) Fire resistive passageways not regulated by the preceding paragraph shall be completely enclosed by construction having a fire resistance rating not less than 45 minutes.
  - 5) Openings in passageway enclosures.
    - A) Interior doorways providing access into or from fire resistive passageways shall comply with the provisions of Section 185.370 (m) applicable to interior exit doorways and doors.
    - B) Interior-doorways in fire resistive passageway enclosures shall be limited to those doorways providing access there into from Assembly Occupancies, interior exit stairs and ramps, corridors and primary egress aisles. Doorways providing direct access there into from individual

classrooms or from other rooms or spaces shall be prohibited except in those cases where such doorways serve as part of a required secondary path of travel or as the sole means of ingress-egress for an Educational Occupancy classroom having a capacity of not more than 60 persons.

- C) No openings other than the required exterior exit doorways and those interior exit doorways permitted under the preceding paragraph shall be permitted in the construction enclosing fire resistive passageway.

EXCEPTION: In those fire resistive passageways required to have a fire resistance rating of 45 minutes, borrowed light openings, which are glazed with wired glass not less than 1/4 in. thick and secured on all four sides, shall be permitted provided the size of such panels is not more than 800 sq. in.

- D) All duct openings in fire resistive passageway enclosures shall be protected by approved fire doors or fire dampers where the size of such openings is more than 120 sq. in.

6) Minimum height and width.

- A) The clear height of fire resistive passageways shall be not less than 8 ft. except that a clear height of not less than 6 ft. 6 in. shall be permitted for doorways and other obstructions.

- B) The clear width of fire resistive exit passageways shall be not less than 8 ft.

7) Direction of travel.

- A) Fire resistive passageways may have single directional travel for a distance of not more than 100ft. measured from point of access there into.

- B) Travel in two directions from point of access there into shall be required wherever the distance of travel therein exceeds 100 ft.

f) Exterior exits

Exterior exits, as referred to in this Part, shall comply with the definitive limitations set forth in Section 185.220 (b).

- g) Horizontal exit
- 1) Horizontal means of travel from one building or fire area into an interior place of safe refuge located in an adjacent building or fire area shall be approved for use as an exit and shall be referred to as a "horizontal exit," provided such complies in full with the requirements of this subsection.
  - 2) Horizontal exiting may be used as a required exit for not more than 50% of the required exit capacity of two buildings or fire areas served thereby.
  - 3) The capacity of a horizontal exit shall be established by the capacities of the doors, bridges or balconies which together comprise the horizontal exit and by the limitations imposed by the size of the place of refuge as established under Section 185.370 (g).
  - 4) Interior place of safe refuge.
    - A) For use in connection with a horizontal exit, an interior place of safe refuge shall comply with the definitive limitations of this subsection.
    - B) An interior place of safe refuge shall be located within an area of a building which is separated from the area to be exited either by a space open to the outside or by an approved fire wall or fire partition. The separating fire wall or partition shall comply with the applicable provisions of Section 185.390 (g) and shall have no openings, other than those serving as the required means of exit travel, unless such are protected by self-closing, Class B fire doors or by UL approved fire dampers cross-connected with the building fire alarm system in such a manner as to effect immediate closing upon actuation of the fire alarm system.
    - C) An interior place of safe refuge shall be of adequate size to provide standing room in the corridor or aisle into which a horizontal- exit discharges for the total number of persons required to exit there into from the adjacent or bordering fire area, based on one person per 3 sq. ft. of net area.
    - D) Every interior place of safe refuge shall have direct access to at least one approved exit other than an horizontal exit. The total capacity of such exit or exits (excluding that of the horizontal exit) shall be

sufficient to serve not less than 60% of the total population capacity of the fire area which contains the place of safe refuge under consideration. The fire area population capacity shall be determined as provided for under Section 185.310 (f) without consideration given to the existence of the horizontal exit or to the number of persons exiting there through.

- 5) Doors and doorways.
  - A) Doors serving as part of a horizontal exit shall comply with the provisions of Section 185.370(m) and 185.390(g)(2). All interior doors in the fire wall or partition providing the horizontal exit separation shall be of self-closing type.
  - B) All exit doors shall swing in direction of travel. Where a horizontal exit functions as a means of exit for the areas on both sides of the separating wall, partition or open space, two doors swinging in opposite directions shall be provided and each properly identified by an exit sign.
  - C) All exit doors functioning as a horizontal exit shall be provided with panic hardware if subject to locking at any time. Doors opening onto unenclosed balconies or bridges shall be considered as exterior exit doors and comply with the applicable requirements of Section 185-370 (m).
  - D) Every exit door serving as a horizontal exit shall be provided with a vision panel glazed with clear wired glass not less than 100 sq. in@ in are@.

EXCEPTION: Vision panels will not be required in Class "All doors. Where such doors are subject to travel in both directions, they shall be equipped with electrically operated hold-open devices complying with requirements of Section 185. -370 (m)(7) (B-Exception).

- 6) Exterior bridges or balconies serving as part of a horizontal exit shall comply with the applicable provisions of Section 185.370 (j).
- h) Smokeproof towers

- 1) A smokeproof tower shall be a fully enclosed stairway separated from the building served thereby by walls complying with Section 185.370 (h)(5) or by an open space with all paths of travel leading to such enclosed stairway provided by bridges or landings partially or wholly open to the outer air. A smokeproof tower shall be approved for use as an exit when in compliance with the requirements of this Subsection.
- 2) Smokeproof towers and stairs shall comply with all requirements established in Section 185.370 (c) for Class A and B interior exit stairs unless otherwise specified in this Subsection.
- 3) Use restrictions. No storage or other functional use shall be permitted within a smokeproof tower.
- 4) Width and capacity of stairs.
  - A) The width limitations and measurements of stairs in smokeproof towers shall be the same as for Class A and B interior exit stairs as provided for under Section 185.370(c)(6) and 185.370(c)(9).
  - B) The capacity of stairs in smokeproof towers shall be 80 persons per unit of exit width.
- 5) Enclosing walls.
  - A) All smokeproof tower enclosing walls shall be noncombustible construction in compliance with the requirements of this Subsection. No fire resistance rating shall be required except where specifically required herein.
  - B) All smokeproof tower enclosing walls shall have a fire resistance rating of not less than 1-hour where such walls, or portions thereof:
    - i) Serve as separation (no intervening open space) between the towers and the buildings served thereby.

EXCEPTION: 2-hour fire resistance rating required for towers more than 4 stories-in height.
    - ii) Are a direct extension of the exterior walls of the buildings served thereby where such exterior walls are of combustible construction. No rating shall be required where such exterior walls are of noncombustible construction.

- iii) Are located less than 10 ft. (measured horizontally) from an exterior building wall of combustible construction or less than 6 ft. from unrated noncombustible exterior building walls or from those rated noncombustible exterior building walls having unprotected openings (other than door openings) which provide an exposure to such towers.
  - C) No openings other than the required exit door openings shall be permitted in those walls, or portions thereof, which are required to have a fire resistance rating.
  - D) Windows in tower enclosing walls shall be of fixed noncombustible sash where located less than 15 ft. away from any windows or other unprotected openings in the walls of the adjacent building. Wired glass panels shall be required wherever such windows are located less than 10 ft. away from any windows or other openings in the walls of the adjacent building.
- 6) Access to smokeproof tower.
- A) Exit travel from the building to the smokeproof tower shall be by means of a landing or bridge open to the outside on at least one side and having an unobstructed length and width not less than the required width of the exterior exit doors leading thereon.
  - 8) The bridges or landings shall have balustrades or railings complying with the corresponding requirements for Class A or 8 fire escape stairs under Section 185.370 (j)(12).
  - C) All window openings in the wall of the building to be exited which are located below and within 10 ft. (measured horizontally) of the access bridges or landings shall be protected in accordance with the corresponding exposure protection requirements for Class A or B fire escapes as set forth in Section 185.370 (j)(9).
  - D) The floor level of the landing or bridges shall be between 5 in. and 7 in. below the floor levels of the building floors served thereby, unless the protection (roof, partial side-wall curtains, etc.) provided against the elements is adequate to minimize the possibility of heavy accumulation of snow or ice thereon. There shall be no step from the balcony or landing onto the stair landing within the smokeproof tower.

- 
- E) Doors providing access onto the landings or bridges and from there into the smokeproof towers shall be self-closing, exterior exit doors (Section 185.370(m)) swinging in the direction of exit travel and shall each be provided with a wired glass vision panel not less than 100 sq. in. in area.
- i) Exterior exit stairs and ramps
- 1) All permanently constructed exterior stairs and ramps complying with the provision of this Subsection and with dimensional and construction requirements applicable to Class A or Class B interior exit stairs and ramps, as provided under .Section 185.370 (c) and 185.370 (d) shall be acceptable as an approved means of exit travel.
  - 2) Exterior exit stairs and ramps shall be of noncombustible construction, except that combustible construction shall be permitted for those stairs and ramps serving the street floor only, provided such stairs and ramps are of structurally stable wood construction with no structural members or stair treads less than 2-in. nominal thickness.
  - 3) Exterior exit stairs and ramps shall be of adequate width to serve the total. capacity required to exit thereon with the capacity of such stairs and ramps based on 60 persons per unit of exit width.
  - 4) All exterior exit stairs and ramps serving as required means of exit for more than 60 persons shall be provided with protection against the accumulation of snow and ice thereon. The Enforcing Authority may waive this requirement where such are regularly used as a means of ingress-egress or where he or she is convinced that an adequate program for the removal of snow and ice will be maintained.
  - 5) Exterior exit stairs and ramps shall be provided with handrails and balustrades in compliance with the requirements for Class A or B fire escapes, as set forth under Section 185.370 (k).
  - 6) Exterior stairs and ramps running parallel to and within 10 ft. of the exterior walls of the building-served thereby and serving as means of exit for more than one story above the street floor shall be protected against fire exposure in compliance with the applicable requirements for Class A and B fire escapes as set forth under Section 185.370 (k)(9).

- 7) Exterior exit stairs and ramps shall extend to a grade level and provide safe means of travel to a place of safe refuge.
- 8) Stairs of noncombustible construction without nosing shall be permitted for use as an exterior exit stair provided the treads are not less than 11 in. in width and the height of risers is not more than 7 in. Exterior curved stairs shall also be permitted where the inner-radius is not less than 15 ft.
- 9) No storage shall be permitted beneath or on any exterior exit stair or ramp.
- j) Exterior balconies, areaways, bridges and roof walkways
  - 1) Exterior balconies, landings, areaways, bridges and roof walkways may be used as part of a required exit where such comply with the provisions of this Subsection; are accessible and usable at all times by means of approved exterior exit doors; and lead directly to a place of safe refuge, or indirectly thereto, by means of approved smokeproof towers, exterior stairs or ramps, fire escape stairs, etc.
  - 2) Exterior balconies and landings which function as an integral part of, or lead to, a fire escape or slide escape shall comply with the applicable provisions of Section 185.370(k) and 185.370(l) where such are not more than 20 ft. in length and serve not more than two exit access doors. Other exterior balconies and landings shall comply with the construction requirements of Section 185.370 (j)(4).
  - 3) Width and capacity.
    - A) The minimum width shall be 36 in. measured in the clear.
    - B) The unit of exit width shall be as defined under Section 185.220 (c) with no allowance made for any projections.
    - C) The capacity shall be 100 persons per unit of exit width.
  - 4) Construction.
    - A) Exterior balconies, landings and bridges used as part of a required exit shall be of noncombustible construction rigidly attached to the buildings served thereby.

- B) Roof walkways used as part of a required exit shall be permitted above only those roofs which are of noncombustible construction or of one hour fire resistance rating or fully sprinklered combustible construction. Roof covering shall be Class A or B as listed by UL.
- C) Exterior balconies, landings, areaways and bridges serving as part of a required means of exit for more than 100 persons shall be provided with protection against the accumulation of snow and ice. The Enforcing Authority may waive this requirement when such are regularly used as normal means of ingress-egress or when he or she is convinced that an adequate program for the removal of snow and ice will be maintained.
- D) The floors of balconies, landings, areaways and bridges shall be substantially level. Where not protected against the accumulation of snow and ice thereon, the floor level shall be between 5 in. and 7 1/2 in. below the sill of the doors providing access thereto. This provision shall not apply where access thereto is by means of inward swinging doors, where such doors are permitted under Section 185.370 (m).
- E) Floors shall be solid with non-slip surfacing except that grated or perforated flooring may be used for roof walkways and for those balconies, landings and bridges which serve as required means of exit for not more than 150 persons.
- F) Exterior balconies, landings, areaways, bridges and roof walkways shall be of sufficient strength to sustain safely a live load of not less than 100 psf or a concentrated load of 300 lbs. so located as to provide maximum stress conditions.
- G) Exterior balconies, landings and bridges shall be provided with balustrades or railings, in compliance with the requirement established for Class A or B fire escapes under, Section 185.370 (k).
- H) Roof walkways shall be provided with railings so arranged and designed as to provide safe path of travel in the event of accumulation of snow or ice and to properly identify the path of travel.

- 
- I) Roof walkways shall not pass within 10 ft. of unprotected roof openings or over rooms or spaces used for the storage or handling of flammable liquids.
  - J) Recessed areaways serving as required means of exit travel from basements, shall be of noncombustible, ground-supported construction and provided with adequate means of drainage.
- 5) Access to exterior balconies, landings, areaways, bridges and walkways.
- A) Access to exterior balconies, landings, areaways, bridges and roof walkways (when directly reached from within the building) shall be by exterior exit doors complying with the applicable provisions of Section 185.370 (m).
  - B) Such doors shall not reduce the clear width of the involved balcony, landing areaway, bridge or roof walkway by more than 10 in. when in the full open position. The clear width, for the purpose of establishing the units of width, shall take into account any reduction resulting from the full open swing of doors.
- 6)
- A) All glass panels in doors and windows which are so located as to expose exterior balconies, landings, areaways, bridges and walkways shall be glazed with wired glass. Such wired glass panels, where located in doors, shall not exceed 720 sq. in. or have any dimensions greater than 54 in. Where located in windows, such panels shall not exceed 1,296 sq. in. or have any dimension more than 54 in.
  - B) EXCEPTION: The above requirement shall not apply to door or window openings located in the exterior walls of sprinklered buildings or in the exterior walls of those normal Educational Occupancy classrooms which have an interior flame spread rating of not more than 25, or for openings located between separated exit stairs.
- 7) Maintenance and painting. The applicable provisions of Section 185.370 (k)(15) shall be considered to apply to all exterior balconies, landings, bridges and roof walkways.
- k) Fire escapes

- 1) Exterior stairs of metal construction serving as a required means of exit, which are not regularly used as a means of ingress-egress, shall comply with either the requirements of Section 185.370 (i) or of this Subsection. Those complying with the requirements of this Subsection shall be referred to as "fire escape stairs."
- 2) Fire escape stairs shall be permitted as an approved means of exit for only those pupils above the second grade level and only where specifically approved by the Enforcing Authority.
- 3) Fire escape stairs shall provide an unobstructed path of safe travel to a place of safe refuge at ground level. When fire escapes are not continuous, as in those cases where stairs lead to an adjoining room which must be crossed before continuing downward travel, the direction of travel shall be clearly indicated and walkways with handrails provided in compliance with the applicable provisions of this Part, and the two shall be so arranged and connected as to provide a continuous path of safe travel to a place of refuge.
- 4) Approved types.
  - A) Fire escape stairs shall be either the return platform type with superimposed runs or the straight run type with platform continuing in the same direction, or a combination thereof...
  - B) Fire escapes of the following types shall not be permitted for use as a required exit:
    - i) Ropes, chains or steel tapes, with or without controlled slide devices to facilitate their use;
    - ii) Portable ladders;
    - iii) Slide poles;
    - iv) Spiral stair escapes;
    - v) Wooden escape stairs and ladders;
    - vi) Metal ladders (except to the extent specifically approved by Section 185.370 (k)(5) and 185.370 (k)(14).

- 5) Fire escape classification and limitations.
  - A) Each fire escape stair shall be classified into one of three classes, Class A, B or C, depending upon its compliance with the dimensional and other limitations set forth in Section 185.370 (k)(8) hereof.
  - B) Class C fire escapes shall be permitted only when serving as a means of exit for a total of not more than 20 persons when no winders or ladders are used, and 10 persons when winders or ladders from the bottom balcony down are used; and only then if specifically approved by the Enforcing Authority.
  - C) All new fire escapes shall be of either Class A or B type.
- 6) Width of fire escape stairs. The "unit of exit width" for fire escape stairs shall be as defined in Section 185.220. Measurement shall be made in the clear without allowance for railings except as permitted in Section 185.370 (k)(8) for Class A escapes.
- 7) Capacity of fire escape stairs.
  - A) The capacity of Class A and B fire escapes shall be 60 persons per unit of exit width when serving only one story above the street floor and 45 persons per unit of exit width when serving more than one story.
  - B) The capacity of a Class C fire escape shall be 15 persons per unit of exit width.
  - C) The same units of exit width, or fraction thereof, required for any individual floor above the ground level may be considered as being simultaneously available for exit use by all other floors served by the same fire escape.
  - D) Fire escape stairs shall constitute not more than 50% of the required exit capacity of any one floor or fire area.
- 8) Dimensional and definitive limitations-Class A, B and C fire escapes. Appendix A Table J provides the dimensional and definitive limitations for each class of fire escape stair:
- 9) Exposure protection
  - A) Class A and B fire escape stairs shall be so located and designed to be exposed by the smallest number of window and door openings as is practical.

- 5) Fire escape classification and limitations.
  - A) Each fire escape stair shall be classified into one of three classes, Class A, B or C, depending upon its compliance with the dimensional and other limitations set forth in Section 185.370 (k)(8) hereof.
  - B) Class C fire escapes shall be permitted only when serving as a means of exit for a total of not more than 20 persons when no winders or ladders are used, and 10 persons when winders or ladders from the bottom balcony down are used; and only then if specifically approved by the Enforcing Authority.
  - C) All new fire escapes shall be of either Class A or B type.
- 6) Width of fire escape stairs. The "unit of exit width" for fire escape stairs shall be as defined in Section 185.220. Measurement shall be made in the clear without allowance for railings except as permitted in Section 185.370 (k)(8) for Class A escapes.
- 7) Capacity of fire escape stairs.
  - A) The capacity of Class A and B fire escapes shall be 60 persons per unit of exit width when serving only one story above the street floor and 45 persons per unit of exit width when serving more than one story.
  - B) The capacity of a Class C fire escape shall be 15 persons per unit of exit width.
  - C) The same units of exit width, or fraction thereof, required for any individual floor above the ground level may be considered as being simultaneously available for exit use by all other floors served by the same fire escape.
  - D) Fire escape stairs shall constitute not more than 50% of the required exit capacity of any one floor or fire area.
- 8) Dimensional and definitive limitations-Class A, B and C fire escapes. Appendix A Table J provides the dimensional and definitive limitations for each class of fire escape stair:
- 9) Exposure protection
  - A) Class A and B fire escape stairs shall be so located and designed to be exposed by the smallest number of window and door openings as is practical.

185.3170

SUBTITLE A

SUBCHAPTER d

- B) An "opening" exposing a fire escape as referred to herein, is an opening located below the highest landing or walkway floor of the fire escape and within 10 ft. measures horizontally of a plumb line dropped from any point on the fire escape stairs, walkways, or landings.
  - C) Glass panels in door and window openings exposing fire escape stairs and landings shall be glazed with wired glass. Such wired glass panels, where located in doors, shall not exceed 720 sq. in. or have any dimension more than 54 in. Where located in windows, such panels shall not exceed 1,296 sq. in, or have any dimension more than 54 in.
    - EXCEPTION: Plate glass (not less than 1/4 in. thick) shall be permitted in lieu of the required wired glass in exterior window and door openings located in sprinklered Educational Occupancy rooms or spaces.
  - D) Where fire escape stairs are located in small courts the least dimension of which is less than one-third their height, all openings below shall be protected, unless the building is completely sprinklered.
- 10) Access to fire escapes.
- A) Access to fire escapes shall comply with the limitations established in Section 185.370 (k)(8) and with the requirements hereinafter provided.
  - 8) Access doors shall comply with those provisions of Section 185.370 (m) applying to exterior exit doors.
  - C) Where access to a fire escape through a window is permitted, such window shall be located with the sill not more than 18 in. above the level of the exterior balcony or landing nor more than 36 in. above the-interior floor level. Each such window shall be easily openable and accessible.
- 11) Materials and strength.
- A) Iron, steel, or concrete or other approved noncombustible material, shall be used for the construction of fire escape stairs, balconies, railings, and other features appurtenant thereto.

- B) Balconies and stairs shall be designed to carry a load of 100 psf or a concentrated load of 300 lbs. so located as to produce maximum stress conditions.
  - C) All structural members shall be designed with a safety factor of 6.
  - D) Minimum dimensions of any structural iron or steel members shall be 1/4 in. Except when embedded in masonry or concrete or provided with a suitable noncombustible and waterproof covering, the entire surface of all structural metal members shall be capable of being inspected and painted.
  - E) All supporting members for balconies and stairs which are in tension and are fastened directly to the building shall pass through the wall and be securely fastened to the opposite side or shall be securely fastened to the framework of the building. When-metal members pass through walls, they shall be protected effectively against corrosion.
  - F) Balcony and stair enclosures and railings shall be designed to withstand a horizontal pressure of 50 lbs. (with a safety factor of 6) per running foot of railing or enclosure without serious deflection, and support at walls for such railings or enclosures shall be in the same manner specified for tension members in par. (E) above.
- 12) Enclosures and rails.
- A) All exterior balconies, landings and stairs functioning as part of a fire escape or an exterior path of travel leading thereto shall be provided with enclosures or rails complying with the provisions of this Subsection and Section 185.370 (k)(13)(E).
  - B) Enclosures and rails shall be so constructed as to provide adequate safety against falling throughout the total length of the fire escapes. Such enclosures and rails shall be installed on both the interior edge and exterior edge of the balconies, landings, and stairs except that they may be omitted on the interior edge (nearest to the adjacent building) where such edge is not more than 3 in. away from the adjacent building wall.

- C) All enclosures and rails shall be not less than 36 in. in height. For stairs, height shall be measured from the front edge of the tread.
  - D) Balconies, landings, and stairs which are part of a Class A fire escape shall be provided with enclosures of solid, slatted, grille or screen construction. Openings in such enclosures shall be not more than 8 in. in horizontal width.
  - E) Balconies, landings and stairs which are part of a Class 8 fire escape shall be provided with enclosures complying with the requirements of the preceding paragraph or with three equally spaced rails.
  - F) Handrails approximately 30 in. above the forward edge of the tread (measured in line with the face of the riser) shall be provided on both sides of the stairs, except that, when the enclosure is not more than 37 in. in height, the top rail of the enclosure may serve as the handrail. The design shall be such that there shall be no obstructions tending to break the hand hold.
- 13) Swinging stairs.
- A) Swinging stair sections shall not be permitted for Class A fire escape stairs and may be used for only those Class B fire escape stairs which are so located over sidewalks, alleys, or driveways that it is impracticable to build stairs permanently to the ground. Where used, swinging stairs shall comply with the provisions of this Subsection and be specifically approved by the Enforcing Authority.
  - B) Swinging stair sections shall not be permitted at any location which is or may be used for parking or for any other purposes of such a nature as to obstruct their proper functioning. Nor shall such sections be permitted to be so located as to provide any obstruction to exit travel from the street floor or basement.
  - C) The width of swinging section of stairs shall be at least equal to that of the escape stairs above.
  - D) The pitch of the swinging section shall not be steeper than that of the escape stairs above.

- E) Railings shall be provided similar in height and construction to those required for the escape stairs above. Railings shall be designed to prevent any possibility of injury to persons located at the head of the stairs or on balconies when the stairs swing downward. Minimum clearance between moving sections at points where hands might be caught shall be four inches.
  - F) The height of swinging stair sections shall not exceed 14 ft. and shall be 14 ft. over public alleys.
  - G) An adequate counterweight shall be provided for swinging stairs. This counterweight shall be constructed to balance about a pivot with no cables used or required and shall be securely bolted in place, except that sliding ball weights or their equivalent may be used to hold stairs up and to help lower them. Counterbalancing shall be such that a weight of 150 lbs. one step from pivot will not start the swinging section and a weight of 150 lbs., one quarter of the length of the swinging stairs from the pivot will positively cause stairs to swing down.
  - H) The pivot for swinging stairs shall have either a bronze bushing or sufficient clearance to prevent sticking as the result of corrosion.
  - I) No latch or lock holding a swinging stair section in the "up" position shall be permitted.
- 14) Fire escape ladders.
- A) No form of ladder shall be permitted as a part of a required exit or fire escape except that ladders conforming with the provisions of this Subsection shall be permitted under the following conditions, subject to the approval of the Enforcing Authority:
    - i) As a means of exit for not more than four able-bodied adults from Mechanical Occupancy Rooms, elevated platforms around mechanical equipment, tunnels, roof areas, attics and other similar spaces.
    - ii) As part of an existing Class C fire escape where such ladder is not more than 12 ft. in height and used to connect the lowest balcony with the ground level.

- B) The capacity of those ladders approved for use as an exit shall be as provided for under Section 185.370 (k)(5)(B) when used as part of an existing Class C escape.
  - C) Fire escape ladders shall be permanently installed in a fixed position, supported by a rigid connection to the building at intervals not exceeding 10 ft.
  - D) Fire escape ladders shall be constructed of iron or steel, or of other metal having equivalent design strength and resistance to corrosion.
  - E) Rails of fire escape ladders shall be not less than 1/2 in. by 2 in. in section and not less than 16 in. apart.
  - F) Rungs shall be not less than 7/8 in. in diameter, and not less than 10 in. nor more than 12 in. on centers. The lowest rung of any ladder shall be not more than 12 in. above the level of the ground or balcony floor beneath it.
  - G) Rungs shall be riveted or welded in position.
  - H) Where ladders are used to provide access to roofs or elevated platforms, rails shall extend not less than 45 in. above the roofline or platform floor, or 45 in. above coping of parapet if there is one. Extension of side rails to the roof shall be carried over coping of the parapet to afford handhold.
  - I) The minimum clearance between the center of rungs and the adjacent wall shall be 27 in. where travel downward is between the ladder and the wall and 6 1/2 in. where travel downward is on the outside of the ladder.
  - J) Ladders shall be vertical or positively inclined. No negative incline (ladder sloping out over head of person using it) shall be permitted.
- 15) Maintenance and painting.
- A) The provisions of this Subsection shall apply to all fire escapes including any balconies or landings.
  - B) All corrosive ferrous materials shall be painted before and after erection.
  - C) Fire escapes shall be inspected at least annually and shall be scraped and painted as often as necessary in order to maintain them in proper condition at all times.

- D) Fire escapes shall be kept clear of all obstacles and shall be promptly cleaned after snow or ice has accumulated upon them.
  - E) Any obstructions which may interfere with the full use of the fire escape stairs, such as clothes lines, projecting sash, awnings, signs, ventilating or air conditioning ducts, telephone or electric power wires, shall be immediately removed.
- 1) Slide escapes (spiral and straight chutes)
- 1) Slide escapes where approved for use as required means of exit shall comply in full with the requirements and limitations set forth in this Subsection.
  - 2) Use restrictions.
    - A) Slide escapes shall not be used as required exits except where used to supplement otherwise inadequate exit facilities and when specifically approved by the Enforcing Authority.
    - B) Slide escapes shall only be counted as exits where regularly used in drills.
    - C) Slide escapes shall not serve as the means of exit for more than 25% of the total capacity of a building or of any individual story or fire area therein.
  - 3) Types of slide escapes.
    - A) Slide escapes shall be attached to buildings or erected independently of them but connected thereto by balconies or bridges.
    - B) The following types shall be considered as approved provided such comply with the other requirements of this Subsection:
      - i) Vertical spiral enclosed chutes.
      - ii) Enclosed straight chutes parallel to or at right angles to buildings.
      - iii) Open straight chutes parallel to or at right angles to buildings.

- 4) Capacity. The capacity of a slide escape, independent of type or size, shall be 80 persons.
- 5) Design of slide escapes.
  - A) The slope of all slide escapes shall be not less than 24 degrees and not more than 42 degrees from the horizontal. On spiral chutes the slope shall be measured by developing the spiral line on the cylindrical section two feet from the inner edge.
  - B) All straight chutes having a slope greater than 30 degrees shall be provided with a section at the lower end at least 10 ft. long which is set at an angle not to exceed 15 degrees from the horizontal and connected with the upper section by a curved compensating section.
  - C) On spiral chutes, transition from one pitch interval to another when necessary on account of differing story heights shall be made by the use of compensating plates so that there is no perceptible interruption of the slide.
  - D) Spiral chutes shall not be less than 28 in. nor more than 42 in. wide; straight chutes shall be not less than 24 in. nor more than 42 in. wide.
  - E) The sideways of spiral chutes shall be banked from a point 12 in. from the outer edge to a point 5 in. above the level of the center of the chute.
  - F) The horizontal distance between vertical supports for straight chutes shall not exceed 10 ft. Spiral chutes shall be braced to the building at each entrance floor and at other points if necessary so that the braces will not be more than 10 ft. apart.
  - G) On enclosed chutes, exterior exit doors shall be provided at each point of access and so constructed that they will not obstruct the use of the chute. All access door openings shall be not less than 30 in. wide and 6 ft. 6 in. high. Where the entrance is direct from the building with no intervening landing or balcony, access opening doors shall be not less than 42 in. high.
- 6) Location and arrangement.
  - A) Chutes installed inside buildings shall conform to all requirements for enclosure of stairways.

- B) Chutes installed outside of a building shall be protected from fire within the building by one of the following methods:
    - i) Be of enclosed noncombustible construction with access there into direct from within the building or indirect by means of covered balconies at vestibules.
    - ii) Be shielded from the building interior by blank walls having noncombustible exterior surfacing.
    - iii) Be shielded from the building interior by exterior walls with openings therein protected in compliance with the requirements of Class A or B fire escapes as set forth in Section 185.370 (k)(9).
  - C) The lower edge of the chute at the discharge point shall be at least 12 in. and not more than 20 in. above the ground or walkway level.
  - D) No door shall be allowed at the discharge points of chutes except where such door is so designed as to assure its openability from the inside of the chute at all times and such chute and door is tested daily.
  - E) All chutes shall lead directly to the street, yard or court connected with the street or to a fire-resistive passageway leading to the street.
  - F) On open spiral chutes, the minimum height of the outer side shall be 36 in. above the lowest point of the adjacent slideway in the same radial vertical plane, except at entrances. On open straight chutes, the minimum height on both sides shall be 24 in. Above the lowest point of the slideway (measured vertically), and in all cases shall be as high as the width of the slideway.
- 7) Access to slide escapes.
- A) On straight chutes, the entrance landing shall be flush with the lowest point in the adjoining surfaces of the slideway. On spiral chutes the center of the entrance landing shall be not less than 12 in. nor more than 18 in. above the lowest point in the adjacent slideway in the same radial vertical plane.

- B) The means of access to slide escapes shall be in compliance with the corresponding requirements established in Section 185.370 (j) and 185.370 (k) for fire escapes except that windows may be used only if a balcony or landing not less than 3 ft. in width is used.
- 8) Materials and strength.
- A) Slide escapes, balconies, platforms and other features appurtenant thereto shall be of noncombustible construction.
  - B) Slideways shall be made of galvanized steel or other approved material with similarly smooth and corrosion resistant surfaces. Joints shall lap over in the direction of descending load or with edges of adjoining sections flanged so as to form a flush joint; all rivets, bolts, etc., to be flat-headed, countersunk, and protected by solder to form a smooth sliding surface.
  - C) The chutes and their supports shall be designed in accordance with approved standards to carry the weight of the structure itself and 100 lbs. per lineal foot of slide (as measured at the middle of the slideway) with a safety factor of 6. Balconies shall be designed to carry a live load of 100 psf with a safety factor of 6.
  - D) All supporting members for balconies and chutes, which are in tension and are fastened directly to the building shall pass through the wall and be securely fastened on the opposite side, or they shall be--securely fastened to the framework of the building. Where metal members pass through walls, they shall be protected effectively against corrosion.
  - E) Balcony and chute enclosures and railings shall be designed to withstand a horizontal pressure of 50 lbs. (with a safety factor of 6) per running foot of railing or enclosure without serious deflection. Support at walls for balcony railings and enclosures shall be as specified for tension members in par. (D) above.
- m) Exit doors and doorways
- 1) The doors and doorways which function as a part of a required exit shall comply with the provisions of this Subsection and shall be classified as either "exterior exit doors" or

"interior exit doors" in accordance with the definitions provided therefor under Section 185.220. Doors which function as part of a required path of travel to an exit but not as a part of the exit itself shall comply with the provisions of Section 185.380 (c) and 185.380 (d)(4).

- 2) Basic rules for exit doors and doorways.
  - A) All exterior and interior exit doors functioning as part of a required exit shall-
    - i) Be so designed, constructed and maintained as to permit safe, unobstructed passage at all times.
    - ii) Be of such type as to be easily and readily openable by pupils from the side from which egress is to be made.
    - iii) Be accessible, with the paths of travel thereto free of obstructions and readily identifiable at all times when the floors, rooms or spaces served thereby are in use.
    - iv) Be of single directional swing type except as otherwise permitted in Section 185.370 (m)(2)(D), 185.370(m)(5) and 185.370 (m)(6)(B).
    - v) Comply with the other applicable requirements of this Part.
  - B) Horizontal sliding, vertical sliding, rolling shutter, accordion or folding type doors shall not be permitted in doorways functioning as part of a required exit or a required path of travel to an exit except where such doorways serve as means of exit for not more than 10 persons or where specifically permitted under Section 185.370(m)(6)(B) or the "Exception" to Section 185.380 (c)(7)(C).
  - C) No turnstiles or similar devices restricting travel shall be permitted to be located in any required exit or path of travel thereto.
  - D) Revolving doors may be used as part of a required exterior exit doorway leading from the street floor to grade, but in no case shall such doors constitute more than 50% of the required capacity of such doorway. All revolving doors shall be equipped with means to prevent their rotation at a rate in excess of 12 revolutions per minute.

- E) The floor level on both sides of every required exit door shall be at substantially the same elevation for a distance, measured from the door, at least equal to the width of such door except that the floor level on the outside of exterior exit doors may be one step lower (not more than 7 1/2 in.) than the level on the inside where serving as a required means of access to those exterior stairs, balconies, fire escapes, etc. which are not adequately protected against the accumulation of snow and ice thereon.
- 3) Exit door widths.
- A) No exit doorway shall be less than 32 in. in nominal width.
  - B) No exit door shall have a leaf width of less than 28 in. or more than 4 ft.
  - C) The "unit of exit width" for exit doors shall be as defined in Section 185.220 (b). An inward projection into a door opening for door jambs or off-set hinging of 2 in. for each full unit of door width shall be permitted without any penalty effect.
  - D) Revolving doors shall each be credited as constituting one-half unit of exit width.
  - E) Exit door openings shall be of sufficient width and numbers to serve the capacity required to travel there through.
- 4) Capacity of exit doorways. The capacity of exit doorways shall be 100 persons per unit of exit width.
- 5) Direction of swing.
- A) Every exterior exit door shall be required to swing outward in the direction of exit travel except that opposite or inward swing shall be permitted for those exterior exit doors serving as a required exit for not more than 50 persons.
  - B) Every interior exit door shall swing in the direction of exit travel where serving as a required means of exit for more than 20 persons.

- C) Where required exit travel through a doorway is in both directions two doors swinging in opposite directions shall be provided, except as otherwise permitted under Section 185.380 (b)(4)(D).
- 6) Construction of doors.
- A) All exit doors shall be of substantial, stable construction and shall be so installed as to provide an effective retardant to the passage of fire, smoke or gases when in the closed position.
  - B) Interior exit doors.
    - i) All interior exit doors shall be of the self-closing type and equipped with hardware complying with the applicable provisions of Section 185.370 (m)(7). .
    - ii) All interior exit doors located in fire walls, fire partitions and other walls or partitions required to have a fire resistance rating of 1-hour or more shall be approved, self-closing, single directional swing, Class A or Class B fire doors mounted in rigid noncombustible frames and so hinged and installed as to permit easy operation by pupils. Latching devices may be omitted for those fire doors which function as normal means of ingress-egress travel for pupils.

EXCEPTION:

Doors complying with Section 185.370 (m)(6)(B)(iii) may be used in interior exit doorways located in that portion of a fire wall or fire partition included within the scope of the "Exception" to Section 1.85.390 (g)(2)(A). Doors complying with Section 185.370 (m)(6)(B)(iii) may be used in interior exit doorways located in those walls and partitions which serve as the enclosure for fire resistive passageways and are required to have a 1-hour fire resistance rating, provided such doorways directly connect the passageways with approved corridors having a flame spread rating of not more than 25 or with those Assembly Occupancies which possess hazard no greater than those normally attendant with auditoriums and gymnasiums and the location of the passageway doorways is more than 20 ft. away from any stage, kitchen, or other increased hazard area.

Approved, automatic, horizontal or vertical (rolling steel shutter) Class A or B fire doors held in open position may be used in combination with self-closing doors complying with Section 185.370 (m)(6)(B)(iii) in order to achieve the required 1-hour protection, provided the temperature rating of the automatic closing mechanism is not less than 212°F and the doors are so installed as to provide reasonable assurance that effective closure of the doorway will be achieved upon actuation of the closing mechanism.

- iii) Interior exit doors which are not specifically required to be approved Class B fire doors or are located in walls or partitions having a fire resistance rating of less than 1-hour, shall be self-closing, single directional swing type of either solid core wood or metal (hollow, insulated or interior filled) construction, mounted in rigid noncombustible frames except that combustible frames with not less than 2 in. nominal members may be used. All borrowed light or vision panels in interior exit doors shall be glazed with approved wired glass.
- iv) All interior exit doors which serve as required means of exit for more than 20 persons or are subject to frequent travel in both directions, shall be provided with clear wired glass vision panels not less-than 100 sq. in. in area.

EXCEPTION: Vision panels will not be required in Class "A" doors. Where such doors are subject to frequent travel in both directions, they shall be equipped with electrically operated hold-open devices complying with the requirements of Section 185.370 (m)(7)(B).

- v) Boiler Room interior exit doors shall comply with the applicable requirements of Section 185.390 (g)(2).

C) Exterior exit doors.

- i) Exterior exit doors shall be weatherproof, non-warping construction and so installed as to be readily operable at all times when the building is occupied and with hardware complying with Section 185.370 (m)(7).

- ii) Vision panels not less than 100 sq. in. shall be provided in doors used frequently in both directions, and shall be glazed with wired glass when exposing exits as required under applicable provisions of Section 185.370 (h) through 185.370 (k)(8)(C).
- 7) Door hardware.
- A) All latches and other releasing devices controlling the opening of required exit doors shall be of simple types with the method of operation obvious, even in darkness.
  - B) Where doors of self-closing type are required by this Part, each such door shall be equipped with a reliable closing device which will automatically cause such door, when opened manually, to return to the closed position. No hold-open features or devices shall be permitted.
    - EXCEPTION: Electrically operated hold-open devices shall be permitted provided such devices are of the "fail-safe type;" are so installed as to effect the immediate closing of the doors upon the actuation of the building fire alarm system; and that such devices are approved for the intended service by the UL, the State Superintendent, or the State Fire Marshal.
  - C) All exit doors serving more than 10 persons, which are subject to latching or locking at any time, shall be provided with approved, knob operated latch sets or with approved panic hardware (See par. "D" below), operable at all times from the side to be exited. All other exit doors shall be of the free push-pull type.
  - D) Panic hardware.
    - i) Doors subject to use by 100 or more persons shall be equipped with approved panic hardware or shall be without latches or locks. Dead-bolt locks, without spring latches, are permitted in lieu of panic hardware on main entrance doors to individual rooms. In all such cases, at least one door must be operable from the inside at all times without a key.

- ii) Panic hardware or automatic releasing latches (fire exit bolts), as required herein, shall be UL listed for intended service. Releasing bars or panels shall be located not less than 30 in. nor more than 45 in. above the floor. Releasing bars or panels, which are located on doors serving as required means of exit travel for more than 100 persons, shall extend not less than two-thirds of the width of such doors.
  - E) Power operated doors. Where required exit doors are operated by power, such as those doors equipped with a photoelectric actuated mechanism to open the door upon approach of a person or with power-assisted manual operation, the design shall be such that in event of power failure the door may be manually opened to permit exit travel there through or manually closed if necessary to safeguard ways of exit.
  - F) Screen and storm doors. No screen door or storm door in any required exit shall swing against the direction of exit travel in any case where the exit doors involved are required to swing with the exit travel.
- n) Secondary means of escape
  - 1) Where reference is made in this Part to a "secondary means of escape," such shall refer to a means of egress from a room or space which leads directly to a place of safe refuge on the outside, but which does not comply with all of the requirements for approval as an approved-exit.
  - 2) Where credit is allowed under this Part for the presence of secondary means of escape, such shall comply with the provisions of this Subsection.
  - 3) A secondary means of escape shall be so constituted and arranged as to permit pupils to reach a place of safe refuge with a minimum of assistance required from the attendant teachers and further shall be so maintained as to be accessible and usable whenever the room or space served thereby is occupied. Steps shall be provided to facilitate egress for small children, where ever warranted by prevalent conditions.
  - 4) A window shall qualify as a secondary means of escape provided such window complies with the following:

- 
- A) Has an unobstructed opening not less than 24 in. in height and 32 in. in width.
  - B) Is located with the sill not more than 36 in. above the floor level on the inside or the ground, balcony or roof level on the outside.
  - C) If located below ground level,, is provided with a window well of sufficient size to permit a person to attain a standing position therein. The window well shall have a floor level not more than 30 in. below adjacent ground level or be provided with a stair, ladder or other approved means of ascending therefrom to the ground level.
- 5) An exterior door not qualifying as an exit door shall qualify as a secondary means of escape where such leads directly or indirectly to a place of safe refuge on the outside.

Section 185.380 Interior Travel to Exits

a) Scope

- 1) Established in this Section are the minimum requirements for the -construction and maintenance of required travel routes leading from each occupied room or space to the required exits. Each such route shall be referred to in this Part as either a "Primary" or a "Secondary" path of travel to an exit(s) depending upon its conformity with definitive limitations provided under Section 185.220 (c) and 185.380 (b).
- 2) The number and general arrangement of the paths of travel to exits shall comply with the requirements provided under Section 185.370 (a)(4) and 185.370 (a)(5), unless otherwise specified under Sections 185.326 through 185.360 of this Subpart.

b) Definitions and basic rules

- 1) For the purpose of establishing the requirements governing required paths of travel to exits, they shall be assumed to start at the required doorways of the rooms and/or spaces under consideration with access travel to such doorways complying with Section 185.380 (b)(2).
- 2) Access to doorways.
  - A) Safe, reliable and unobstructed means of access travel shall be provided from any location in an occupied room or space to the doorway(s) which are required as either part of an exit or which provide a path of travel from such room or space to an exit.
  - B) The location of fuel-burning equipment in relation to the path of access travel to doorways by pupils shall comply with the applicable provisions of Section 185.390 (e)(2)(B)(i).
  - C) No folding screens, type-type doors or screens, swinging gates, draw draperies or other similar items providing obstructions to free and safe travel, shall be placed in the paths of access travel from within any room or space to the doorways which provide access to required exits or required paths of travel thereto for more than 10 persons.
- 3) Primary paths of travel.

- A) "Primary" paths of travel to exits, as used in this Part, shall refer only to those exit travel routes which utilize corridors (Section 185.380(c)) and/or primary egress aisles (Section 185.380 (d)) as the paths of travel to approved exits from the doorways of the rooms and/or spaces involved.
  - B) Access from rooms or spaces to primary paths of travel shall be direct by approved doorways (Section 185.380 (c)(10) and 185.380 (d)(4)) located in the walls, partitions or other construction separating such rooms or spaces from the corridors and/or primary egress aisles involved, except that indirect access (with travel through adjacent rooms enroute to corridors and/or primary egress aisles) shall be permitted for rooms or spaces having a total capacity of not more than 10 persons, if located in an unsprinklered building, or 20 persons, if located in a sprinklered building.
- 4) Secondary path of travel
- A) All paths of travel leading to exits, which do not qualify as primary paths of travel under the provisions of Section 185.380 (b)(3) shall be classified as "secondary" paths of travel.
  - B) A secondary path of travel shall be permitted as an approved path of travel to an exit only where used to supplement a primary path of travel except as otherwise specified under Section 185.370 (a)(5).
  - C) A secondary path of travel shall be permitted to pass through adjacent rooms or spaces enroute to an approved exit provided all doors located in such path of travel are unlocked at all times or are provided with approved releasing devices so installed as to assure their openability from the side(s) exiting there through, at all times.

EXCEPTION: Doors in secondary paths of travel required to be locked during night and other unoccupied periods, due to functional requirements, shall be permitted without approved release devices, provided a strict regulatory program is established to assure that such doors will be unlocked at all times when the rooms served thereby are occupied.

- D) Each door located in a required secondary path of travel shall swing in the direction of travel where serving more than 50 persons except when travel is in both directions.
- 5) Separated paths of travel.
- A) "Separated" paths of travel, where required by this Part, shall be as defined under Section 185.220 (c) and shall comply with the requirements of this Subsection.
  - B) An arrangement wherein two doorways, from the room or space to be exited, enter an approved corridor on opposite sides of an approved fire wall, fire partition or smoke screen which extends across such corridor, shall constitute two separated, primary paths of travel provided both portions of the subdivided corridor are served by an approved exit. An arrangement wherein two such doorways lead into two corridors, which are located in different fire or smoke areas, shall likewise constitute two separated, primary paths of travel.
  - C) Where a separated, secondary path of travel to an exit is referred to in this Part, such shall be so arranged that, throughout its total length, it is cut off from the primary path of travel involved by walls and partitions having construction at least equivalent to those required for corridor enclosure purposes. Such cut-off shall be so constructed and maintained as to provide an effective barrier against the passage of heat, smoke and gases between the primary and the secondary path of travel.
  - D) An exterior exit door in combination with an approved, primary or secondary path of interior travel to another exit shall constitute separated means of exit travel for the room or space served thereby.
- c) Corridors
- 1) A corridor, where referred to in this Part and used as part of a required primary path of travel to an exit, shall comply with the requirements of this Subsection. A corridor, under this Part, shall be considered as an Educational Occupancy.
  - 2) Each corridor shall be separated from the remainder of the building by walls and partitions complying with the applicable requirements of Section 185.390 (g)(4) and 185.390 (g)(5).

- 3) Unenclosed or partially enclosed interior stairs and ramps, where such are permitted under this Part, shall be considered to be part of those corridors which provide the path of travel required to reach them. As such, the stairs and ramps shall be separated from the remainder of the building (corridor excepted) by construction equivalent to that required for the corridors and shall comply with the construction, dimensional and other requirements established under Section 185.370 (c) and 185.370 (d) governing Class A and B interior exit stairs and ramps.
- 4) Corridors shall comply with the general rules established under Section 185.370 (b)(4) unless otherwise specified herein.
- 5) All corridors shall be so arranged as to provide two separate directions of travel, each leading to an approved exit, from each required access doorway leading there into except as otherwise permitted for dead-end corridors under Section 185.380 (c)(9).
- 6) Corridor plenum chambers.
  - A) No corridor shall be used as a supply, exhaust or return air plenum with air movement therein caused directly or indirectly by mechanical means unless such corridor and the building in which it is located comply in full with the requirements of this Subsection.
  - B) Where used as a plenum chamber, the flame spread rating of the interior finish of a corridor shall not exceed 25 in an unsprinklered building or 75 in a sprinklered building.
  - C) All fans and other mechanical means causing air movement in the corridors to be used as plenum chambers shall be equipped with automatic shut-down controls which are interlocked with the building fire alarm system in accordance with Section 185.475.

EXCEPTION: Such controls shall not be mandatory for buildings having direct exterior exiting or for one story unsprinklered or two-story sprinklered buildings complying with the definitive limitations of Section 185.380(c)(6)(E)(ii).
  - D) The hanging of students' cloaks in the open in an unsprinklered corridor used as a plenum chamber shall be restricted to that permitted under Section 185.380 (c)(11)(C).

- E) The use of corridors as plenum chambers shall be restricted, subject to the allowable variances set forth in paragraphs(c)(6)(F) and (G) below, to those located in a building which-
- i) Is not more than one story in height, if unsprinklered, or two stories in height, if sprinklered.
  - ii) Is not more than two stories in height, if unsprinklered, or four stories in height, if sprinklered,-and which is so arranged that every room or space having a capacity of more than 10 persons, if unsprinklered, and 20 persons, if sprinklered, is provided with an exterior exit, a secondary means of escape, or a secondary path of travel to an exit which is fully separated from any corridor plenum chamber.
  - iii) Is not more than three stories in height, if unsprinklered, and five stories in height, if sprinklered-and which qualifies as a Plan B building (direct exterior exiting).
- F) The height limitations established under paragraphs(c)(6)(E) above may be increased one story where all interior stairs, ramps and those other vertical shafts which are connected with the corridor plenum chambers are fully enclosed with all openings in such enclosures protected in compliance with the applicable provisions of Section 185.390 (h).
- G) The height limitations established under paragraph (E) above shall not apply to those buildings with vertical openings fully enclosed in accordance with paragraph (F) above and have (in addition to the controls specified under Section 185.475) automatic dampers actuated by the building fire alarm system, which will close all duct openings to corridors, passageways, stairs and ramps used for exiting purposes.
- H) The height limitations established for sprinklered buildings under paragraph (E) above may be increased one story where sprinkler protection in compliance with Section 185.390 (b)(4) is provided throughout the entire

building; and may be increased two stories where such complete sprinkler protection is provided and interior stairs, ramps and vertical shafts are enclosed and openings protected as specified in the preceding paragraph.

- 7) Width and height of corridors.
- A) The minimum clear width of corridors shall be not less than 8 ft. where serving as required path of travel to an exit for more than 200 persons; 7 ft. where serving more than 100 persons but not more than 200 persons; 6 ft. where serving more than 50 persons but not more than 100 persons; and 44 in. where serving not more than 50 persons.
  - B) The clear height of a corridor shall be not less than 8 ft. except that corridor doorways and other obstructions may be permitted where the clear height thereof is not less than 6 ft. 6 in.
  - C) No fixed or movable equipment or construction shall be permitted within a corridor that will reduce the clear width thereof below the minimum limits herein established except that smoke screens, fire walls and fire partitions shall be permitted across such corridors, provided the doors therein are of sufficient width to serve the total capacity of the rooms and spaces which utilize the corridor as a path of travel to exits.
  - D) EXCEPTION: Where, during evening, vacation and similar "other than normal" occupancy periods it is necessary to use a portion of a building and, for control or security purposes, to prevent unauthorized access into the unused portion, such may be accomplished by the installation of folding or sliding doors or gates across a corridors provided:
    - i) The portion of the building to be used has exits and paths of travel thereto which comply in full with this Part without the use of the corridors possessing such doors or gates;.
    - ii) The doors or gates are maintained continually in the open position at all times except when special functions are held during the prescribed "other than normal" occupancy periods;

- iii) Such doors or gates, when in the open position, comply with the minimum clear width limitations established above;
  - iv) The remaining paths of travel to exits in the portion of the building to be used are clearly marked or otherwise identified so that no confusion will result from the existence, closing and locking of such doors or gates; and
  - v) The arrangement of such doors or gates and operational procedures governing their use are specifically approved by the Enforcing Authority.
- E) No door of any type swinging into an exit corridor shall be permitted which, in its full open position, reduces the clear width of the corridor below the minimum clear width limitations herein established.
- 8) Changes in floor elevation.
- A) The floors of all corridors shall be substantially level.
  - B) Ramps and stairs, where used for floor elevation changes in corridor, shall comply with the construction and dimensional requirements of Section 185.370 (c) and 185.370(d) as applicable to Class A and B exit stairs and ramps, respectively.
- 9) Dead-end corridors.
- A) No dead-end corridor, which provide s single directional travel only for the rooms or spaces served thereby, shall be permitted to extend more than 20 ft. in length except as permitted by the following alternatives:
    - i) Where a dead-end corridor serves as the required primary path of exit travel for not more than 20 persons is located in a sprinklered building, the dead-end length may be increased to 40 ft.
    - ii) Where the rooms or spaces served by a dead-end corridor have a capacity of not more than 100 persons and are provided with a secondary path of travel to an exit separated from such corridor, the dead-end length limit established above may be increased to 40 ft.

- iii) Where the rooms or spaces served by a dead-end corridor have a total capacity of not more than 100 persons and all have access to an approved exterior exit, the dead-end length limit may be increased to 60 ft. in an unsprinklered building and 75 ft. in a sprinklered building.
  - iv) Where every street floor room or space served by a dead-end corridor, which has a capacity of more than 10 persons is provided with an exterior exit, a separated secondary path of exit travel or a secondary means of escape, the dead-end length limit established above may be increased to 40 ft. in an unsprinklered building or 60 ft. in a sprinklered building.
- B) No dead-end corridor more than 20 feet in length shall have an interior finish flame spread rating of more than 25 if unsprinklered or 75 if sprinklered.
- 10) Access doors and doorways.
- A) Doors providing required means of access into corridors shall be of adequate width to serve the total capacity of persons required to exit there through. The capacity of such doors shall be based upon 100 persons per unit of exit width.
  - B) The minimum allowable width of such access doors shall be 32 in. nominal.
  - C) Corridor access doors shall be of single directional type. Swing shall be in the direction of travel for every such door providing corridor access for more than 20 persons. Such doors shall further comply with the limitations of Section 185.380 (c)(7)(D).
  - D) EXCEPTION: Doors providing access into corridors from Storage Occupancy and Mechanical Equipment rooms having a capacity of less than 10 persons may be of a type other than single swing (i.e. double swing, sliding, folding, etc.), provided such doors are either normally maintained in the closed locked position or are each provided with a self-closing device and provided further that such doors furnish a barrier against the passage of heat, smoke and gases equivalent to that furnished by single-directional swing doors complying with the requirements of this Subsection.

- E) Door hardware shall be of the push-pull, or knob-operated latch-set type (except where panic hardware is specifically required under Section 185.370 (m)(7)(D)) and shall be so installed as to permit any corridor access door serving a capacity of more than 10 persons to be readily opened at any time from within the room or space to be exited without requiring the use of a key.
- F) Corridor access doors located in walls and partitions required to have a fire resistance rating of 30 minutes or less shall conform with the following:
- i) Shall be of metal, solid core wood, or structurally stable wood panel construction. Where specifically approved by the Enforcing Authority, full-length, tempered plate glass doors shall be permitted in buildings not more than two stories in height provided such doors serve normal Educational Occupancy rooms or spaces; and the flame spread rating of the corridor and the Educational Occupancy rooms separated by such doors is not more than 25 if unsprinklered or 75 if sprinklered.
  - ii) Borrowed light or vision panels in such doors shall be of fixed sash type glazed with wired glass or plate glass not less than 1/4 inch thick except that double strength plain glass or 40 oz. glass may be used where the area of an individual panel is not more than 200 sq. in. and 600 sq. in., respectively.
- G) Corridor access doors located in walls and partitions required to have a fire resistance rating of 45 minutes shall conform with the following:
- i) Shall be of metal or solid core wood construction.
  - ii) All borrowed light or vision panels shall be fixed-sash glazed with approved wired glass.
- EXCEPTION: In doors providing corridor access from normal Assembly Occupancies, fixed-sash panels glazed with 40 oz. glass and plate glass (not less than 1/4 in. thick) shall be permitted provided the area of each panel is not more than 400 sq. in. and 600 sq. in., respectively.

- H) Corridor access doors located in interior corridor enclosing walls which, by reason of their supplemental function, are required to have a fire resistance rating of 45 min. or more, shall be considered as interior exit doors and shall comply with all requirements applicable thereto, as set forth in Section 185.370 (m) unless more restrictive requirements are set forth in this Subsection.
- 11) Use limitations.
- A) All trash or refuse collection containers located in corridors shall be of noncombustible construction with hinged self-closing covers.
  - B) Corridors shall not be used for any purpose, even on a temporary basis, which will introduce a fire hazard.
  - C) No exposed combustible storage of any type shall be permitted in corridors which serve as a primary path of travel to an exit for more than 20 persons if unsprinklered or 40 persons if sprinklered except as permitted under paragraph (c)(6)(D) and (E) below.
  - D) Subject to the limitations of Section 185.380 (c)(11)(E) below, students' cloaks shall be permitted to hang in the open on the side walls of corridors provided-
    - i) The resulting clear width of such corridors is not less than 85% of the minimum allowable clear width figures established under Section 185.380 (c)(7)(A) and
    - ii) The uninterrupted length of cloaks hung along any corridor wall is not more than 25 ft. in an unsprinklered building or 40 ft. in a sprinklered building. Such length shall be measured horizontally from one end of the cloak hanging hooks or bars to the other end unless the continuity is interrupted by a fire break consisting of a doorway or blank wall area not less than 36 in. in width or of a partition extending outward perpendicularly from the corridor wall not less than 12 inches and upwards from the floor to an elevation not less than 24 inches above the top of the cloaks. This fire break partition, if provided, shall be considered in determining compliance with the limitations of the preceding paragraph.

- E) Open cloak storage shall not be permitted in any unsprinklered corridor serving as primary path of exit travel to an exit for more than 20 persons, which is-
  - i) Connected with an unenclosed or partially enclosed stair or ramp unless such cloaks are located on the top floor served by such stair or ramp or are located in a separate fire or smoke area from such stair or ramp, or
  - ii) Used as an air plenum and located in buildings more than two stories in height, or
  - iii) Located in a basement occupied by more than 50 persons, unless all occupants thereof are provided with a secondary means of escape or a separated path of travel to an exit.
  
- d) Primary egress aisles
  - 1) Where an interior, primary path of travel to an exit is required under this Part and the available path does not qualify as a corridor under the provisions of Section 185.380(c) such a path shall comply with the requirements of this Subsection and shall be referred to as a "primary egress aisle." A primary egress aisle shall be considered as an - Educational Occupancy space and, by virtue of the absence of full enclosure thereof, shall be found only in a building with an open interior arrangement.
  - 2) A primary egress aisle shall comply with all provisions applicable to a corridor as established under Section 185.380(c) except for those pertaining to the enclosing construction and the access doorways or openings located therein.
  - 3) Enclosure of aisles.
    - A) Each primary egress aisle shall be enclosed on both sides by walls, partitions, lockers or other construction which separates the aisle from all adjacent rooms and spaces and clearly defines the path of travel to an exit.
    - B) The enclosing construction for primary egress aisles shall not be required to provide a definite barrier to the passage of heat, smoke and gases and therefore, need not necessarily be continuous or to extend from the floor tight to the ceiling or floor construction above. The

foregoing statement shall not be construed to permit the omission of any walls or partitions which are required to be fire resistance rated or full height, continuous construction by reason of their use to separate more hazardous occupancies from the remainder of the building or to subdivide the building into separate smoke or fire areas.

- C) The enclosing construction, whether consisting of walls, partitions, lockers, folding-type partitions, etc., shall be so installed and anchored to the building as to eliminate the possibility of collapse or movement into the path of travel during emergency conditions possessing panic probabilities. The ability to effectively resist imposed lateral impact or pressure shall be considered of primary importance in determining compliance with this requirement.
- 4) Access, doors, doorways and openings.
- A) Required access into primary egress aisles shall be by means of doorways complying with the provisions of Section 185.380 (c)(10) or by means of openings complying with the provisions of this Subsection.
  - B) Access openings into primary egress aisles may consist of any one of the following:
    - i) Cased openings (with or without doors) with sufficient width to serve the capacity (based on a rated capacity of 100 persons per unit of exit width) required to travel there through. Doors, if provided, shall be of any stable construction with single directional swing and shall otherwise comply with the applicable provisions of Section 185.380 (c)(10).
    - ii) Uncased openings so arranged and located as to provide a reliable and continuously accessible means of entry into the aisle. The width of such openings shall be sufficient (based on a rated capacity of 80 persons per unit of exit width) ' to serve the capacity required to travel there through.
    - iii) The number of access doorways or openings shall comply with the requirements of Section 185.370 (a)(5).

Section 185.390 Construction Requirements and-Physical Safeguards

a) Scope

- 1) Established in this Section are those general requirements deemed to be necessary in order to control the spread of heat, smoke, fumes and gases resulting from a fire or explosion occurrence in such a manner as to permit the safe evacuation of all pupils within the building involved.
- 2) Specific restrictions or allowances specified under Section 185.320 through 185.360 of this Subpart shall take precedence over the requirements established in this Section.
- 3) Heating, air conditioning, ventilation, plumbing and electrical systems shall comply with the applicable provisions of Subpart D through G subject to conformity with specific requirements of this Section.
- 4) Where reference is made herein to sprinkler, fire detection and fire alarm systems-such shall comply with the requirements of Section 185.395 of this Subpart.
- 5) All fire resistive ratings listed by the nationally recognized building codes, the American Insurance Association, or the Underwriters' Laboratories are acceptable. "Fire Resistive Ratings of less than One Hour" is published by the American Insurance Association, 120 S. LaSalle, Chicago, Illinois, and lists many nominal ratings. (Wood lath and plaster in sound condition shall be accepted as being equivalent to one-half hour fire resistive rating).

b) Construction types

1) General.

- A) Established herein are the definitions for the basic construction types referenced under Section 185.310 (b) and Sections 185.320 through 185.360 of this Subpart.
- B) The fire resistance rating requirements hereinafter established for each of the fire construction types shall be considered as the minimum allowable and shall be subject to increase wherever the functional use of the floor or roof assemblies, structural members, walls,

partitions, etc. is such as to require a higher rating under other provisions of this Part. The fire resistance rating for floor assemblies separating basements from street floors shall comply with the provisions of Section 185.390(c) except where higher rating is required by the construction type involved or by Section 185.390 (e)(2)(C).

- 2) Type I-fire resistive construction.
- A) Type I-fire resistive construction shall be limited to that construction in which the structural members, interior and exterior walls and partitions, floor assemblies (excluding floor covering), ceilings, and roof assemblies (excluding roof covering) are of noncombustible materials so designed and constructed as to have fire resistance ratings not less than those hereinafter specified:
- i) Exterior and interior bearing walls (or bearing portions of walls)-2 hour rating.
  - ii) Exterior and interior nonbearing walls (or portions of walls)-no rating except as otherwise specifically required in this Part.
  - iii) Floor assemblies-and the structural members supporting such assemblies-1 hour rating, (concrete pan construction with 2 1/2" minimum floor thickness is acceptable).
  - iv) Roof assemblies and the structural members supporting such assemblies-1 hour rating, (concrete pan construction with 2 1/2" minimum floor thickness is acceptable).
  - v) Decorative and temporary wood roofs shall be permitted when completely cut off from the balance of the building by-a 2 hour floor and ceiling assembly.

EXCEPTION: Noncombustible roof assemblies (and the supporting structural members) without any specific fire resistance rating and heavy timber roof construction complying with Section 185.390 (b)(4) shall be permitted for street floor Assembly, Educational and Special Educational Occupancy rooms or spaces where the minimum height between the floor level thereof and the underside of the roof deck is more than 20 ft.

- B) Combustible core (wood stud) interior partitions having a fire resistance rating of not less than 30 minutes and an exposed surface flame spread rating of not more than 25 shall be permitted as a substitute for those noncombustible partitions which are not required under this Part to have any fire resistance rating.
  - C) Where fire resistive ceilings are used in order to achieve the fire resistance rating required for floor and roof assemblies, such ceilings shall be of noncombustible construction installed in strict conformance with the specifications and limitations established by UL, USBS and other accepted national authorities, upon approving such ceilings in combination with the roof or floor construction above, as meeting the prescribed fire resistance rating. Openings through such ceilings, shall be limited to not more than two electrical outlet boxes (20 sq. in. or less in area) for every 90 sq. ft. of ceiling area; to duct openings protected by approved fire dampers except that no dampers shall be required when such openings pass directly into shafts or ducts having enclosure walls with fire resistance rating equivalent to that of the ceiling. The allowable size of fire dampered duct openings shall be limited to that established by the aforementioned national authorities. Recessed lights or other fixtures shall be permitted only where such are adequately fireproofed to assure the fire resistive integrity of the ceiling.
- 3) Type II-noncombustible construction.
- A) Type II-noncombustible construction shall be limited to that construction in which the structural members, interior and exterior walls and partitions, floor assemblies (excluding floor covering), ceilings and roof assemblies are of noncombustible materials.
    - i) EXCEPTION: Heavy timber roof construction complying with Section 185.390 (b)(4) may be substituted for the noncombustible roof construction as required herein for Type II construction.
    - ii) Combustible insulation or roofing materials laid directly on the roof deck or panels and combustible insulation or form board attached directly to the underside of the roof deck or panels shall not

affect the classification of a building as Type II construction provided the insulation or form board on the underside does not form a structural support for the roof deck or panels.

- B) No fire resistance rating shall be required for walls, structural members, floor and roof assemblies except where otherwise required in this Part by reason of their specific function.
- 4) Type III-heavy timber construction.
- A) Type III-heavy timber construction shall be that type of construction conforming in full with the definition thereof set forth in NFPA 220-1961 except that interior partitions enclosing stairways and other openings through floors shall be permitted to have a fire resistance rating in conformance with that required in this Part.
  - B) Adhesive or glue used in laminated structural members shall be of an approved, heat-resistant type.
  - C) All interior non-bearing walls and partitions which are not otherwise required by reason of their function to have a greater fire resistance rating, shall be noncombustible or 30 minute rated construction.
- 5) Type IV-ordinary construction.
- A) Type IV-ordinary construction shall be that construction in which exterior bearing walls or bearing portions of such walls are of noncombustible construction having a fire resistance rating of not less than 2 hours; nonbearing exterior walls of noncombustible construction; and the roof, floors, and interior framing are wholly or partially constructed of wood or other combustible materials having a smaller dimension than that required for heavy timber construction.
  - B) Floor and roof assemblies and the structural members and interior walls supporting such assemblies shall have not less than a 30-minute fire resistance rating, except where greater rating is required elsewhere in this Part by reason of their functional use.
  - C) All permanent interior non-bearing walls and partitions which are not otherwise required by reason of their function to have a fire resistance rating shall be of noncombustible or 30 minute rated construction.

- 6) Type V-wood frame construction.
  - A) Type V-wood frame construction shall be that construction in which exterior walls, bearing walls and partitions, floor assemblies and roof assemblies are wholly or partially constructed of wood or other-combustible materials and so constituted as not to qualify as heavy timber or ordinary construction. Wood frame construction is differentiated from ordinary construction by the combustible nature of exterior walls or by the absence of any general fire resistance rating requirements for exterior bearing walls, floor and roof assemblies and their structural supports.
  - B) Type V buildings with masonry exterior and bearing walls may still not qualify for Type IV construction due to unprotected (or metal) ceilings and nonbearing walls.
- c) Special provisions-basements
  - 1) Every unsprinklered basement, located wholly or partially beneath any portion of a building occupied by pupils, shall be separated from the story immediately above by a continuous, structurally stable floor assembly having not less than one hour fire resistance rating with all vertical openings therein protected as provided for in Section 185.390 (c)(3), 185.390 (e)(2) and 185.390 (h) (concrete pan floor construction with 2 1/2 in. minimum thickness or wood joists with metal lath and, plaster is acceptable). Where fire resisting ceilings are used in order to achieve the required rating, such ceilings shall comply with the requirements of Section 185.390 (b)(2)(C).
  - 2) Every sprinklered basement, located wholly or partially beneath any portion of a building occupied by pupils, shall be separated from the story immediately above by a continuous, structurally stable floor assembly with all vertical openings therein protected in accordance with the provisions of Section 185.390 (c)(3), 185-390 (e)(2) and 185.390 (h). Such floor assembly shall provide an effective retardant to the passage of heat, smoke and gases from the basement to the floor above.
  - 3) The fire resistance rating of interior stair and ramp enclosures shall comply with the requirements of Section 185.390 (h) and Section 185.370 (c)(11)(A).
- d) Special provisions-under floor crawl spaces

- 1) Under floor crawl spaces and unoccupied tunnels shall be separated from adjacent occupied portions of the basement or street floor, when applicable, by smoke-tight partition with all access doors therein a maintained closed and locked.
  - 2) No storage of any type shall be permitted in under floor crawl spaces or unsprinklered tunnels.
  - 3) All under floor crawl spaces and tunnels containing gas or flammable liquid distribution piping shall be provided with ventilation in accordance with applicable provisions of Subpart D of this Part.
- e) Special provisions-mechanical occupancies and systems
- 1) General use restrictions:
    - A) No air conditioning, ventilation, heating, cooking or other service equipment shall be so located, installed or operated as to endanger exits or paths of travel thereto; to facilitate the spread of fire or smoke throughout a building; or to otherwise create abnormal hazards to the safety of a building's occupants.
    - B) Special precautions shall be taken where heavier-than-air gaseous fuels, such as propane, butane, certain mixtures of LPG and natural gas, etc., are used to prevent the accumulation of such gases in low spots. No piping, appliances, devices or controls shall be located in rooms or spaces having their floors below grade or having openings to below grade spaces or in other rooms or spaces where-the-gas could pocket unless positive means of ventilation are provided to the outdoors. Where fans or other mechanical devices are used to establish this ventilation they shall be of non-sparking construction, with motors, controls, belts and wiring outside of air stream, and these fans and devices shall be interlocked with a fail safe device to shut off the fuel supply when ventilation stops, at a point before fuel line enters the space under consideration. Manually operated windows and doors will not satisfy this ventilation requirement. Precautions shall be taken to prevent negative pressure at all fuel burning equipment.

- C) Except for self-contained pieces of equipment whose gas container has a maximum water capacity of 2 1/2 lbs. no cylinder or tank containing a heavier-than-air fuel gas shall be installed, stored or used inside any school building. Outdoor installations, including valves, regulators, relief valves, etc., and storage of cylinders shall comply with NFPA No. 58-1963.
  - D) The location of mechanical equipment and of flammable liquid and compressed gas storage facilities shall comply with the restrictions established therefore under Section 185.370(b)(4)(H).
  - E) Portable, fuel-burning space heaters shall be prohibited.
  - F) Combustible air filters shall not be permitted in any air-conditioning, heating or ventilation system. All insulation installed inside of ducts, shafts, or equipment shall be noncombustible.
- 2) General requirements-boiler, furnace and incinerator rooms.
- A) All fuel-burning equipment and all fuel supply and distribution systems shall comply with the requirements of Subpart D and G.
  - B) All fuel-burning equipment whose purpose is to provide heat for space heating or for domestic hot water heaters shall be located in boiler, furnace or equipment rooms (herein referred to as "Boiler Room") complying with the provisions of this Subsection, subject to the following exceptions:
    - i) Unitary factory assembled or packaged type fuel-burning furnaces and boilers with total input capacity of not more than 1.5 gph for oil and not more than 200,000 Btu per hour for gas may be located within other rooms or spaces provided such furnaces and boilers do not provide-an exposure to an exit, a corridor, a primary egress aisle or other required paths of travel to an exit; are adequately protected against physical damage or tampering by pupils; and are installed and operated in full compliance with the applicable provisions of Subpart D.

- ii) Unitary factory assembled package type, fuel-burning hot water heaters may be installed in kitchens, home economics classrooms, locker rooms, toilets and other similar rooms or spaces provided such comply with the provisions of the preceding paragraph.
- C) All boiler rooms shall be separated from the remainder of the building by walls and floor assemblies having a fire resistance rating of not less than one hour (or be of concrete pan construction with a minimum 2 1/2 in. floor thickness or wood joists with metal lath and plaster) except that a two hour rating shall be required for the walls of those Boiler Rooms located in the basement of an unsprinklered building more than one story in height or directly beneath a Class A or B Assembly Occupancy.
- EXCEPTION: Thirty minute rated walls and floor assemblies shall be permitted for the separation of those Boiler Rooms housing unit or package type furnaces, boilers and hot water heaters with total input of not more than 200,000 B.T.U. per hour provided such are-
- i) Located wholly above grade,
  - ii) Utilize gas or light oil (No. 4 and lighter) as a fuel,
  - iii) Are not located so as to directly expose an exit, corridor, a primary egress aisle, or required paths of travel thereto.
  - iv) and provided further that the Boiler Rooms housing such equipment: have an interior finish flame spread rating of not more than 25, are maintained free of all combustible storage, are regularly inspected to insure conformity with the requirements of this Part and, are provided with adequate combustion air openings.
- D) All walls and floor assemblies enclosing Boiler Rooms shall be so constructed as to provide an effective barrier to the passage of fire, heat, smoke and gases. Open space around all piping, ducts, and shafts passing through such walls and floor assemblies shall be caulked with noncombustible materials or otherwise eliminated in an approved manner.

- E) In those Boiler Rooms where separating walls are required to have a fire resistance rating of 1-hour or more, all interior doorways shall be protected by approved, self-closing Class B fire doors swinging inward. No borrowed light openings or vision panels other than those allowed in the Class B fire door shall be permitted.
  - F) In those Boiler Rooms where separating walls are required to have a fire resistance rating of less than 1-hour, all door openings shall be protected by self-closing, Class C fire doors or by self-closing metal or solid core wood doors. All vision panels located in such doors shall be glazed with clear wired glass not less than 1/4 inch in thickness. No other borrowed light or vision panels shall be permitted.
  - G) Ducts and shafts at points of passage through interior walls and floor assemblies enclosing Boiler Rooms which are required to have a fire resistance rating of one hour or more, shall be protected by approved fire doors or dampers in compliance with the applicable requirements of NFPA 90A-1963, 90B-1963 and 91-1961, subject to the following exceptions-
    - i) No protection shall be required for those duct or shaft openings, the tops of which are located less than four feet above the Boiler Room floor level.
    - ii) No protection shall be required for openings in those air ducts or shafts which are connected with and controlled by primary air fans and designed to automatically shut down upon-actuation of the fire alarm system, in compliance-with the applicable provisions of Section 185.475.
    - iii) No protection shall be required for those duct or shaft openings less than 400 sq. in. in size where located in an unsprinklered Boiler Room and 800 sq. in.
  - H) Incinerators shall comply with the applicable requirements of Section 185.480.
- 3) General requirements-mechanical equipment rooms.
- A) Central air fans (primary air fans) shall comply with the requirements applicable thereto, as established under Subpart D.

- B) Transformers using flammable coolant shall be located in a fire resistive vault in compliance with the applicable provisions of the National Electric Code, NFPA 70-1962.
  - C) Other Mechanical Equipment Rooms not heretofore governed -as to construction requirements shall be separated from all Assembly, Educational and Special Educational Occupancies by walls or partitions complying with the applicable provisions of Section 185.390 (h)(4).
  - D) Where located beneath an Assembly Occupancy, such rooms shall be sprinklered or separated therefrom by a floor assembly having a fire resistance rating of not less than one hour (or be of concrete pan construction with a 2 1/2 in. minimum floor thickness or wood joists with metal lath and plaster).
- f) Special provisions-other occupancies
- 1) Storage occupancies.
    - A) Storage Occupancies, as defined under Section 185.310 (e)(7) shall be separated from all Assembly, Educational, and Special Educational Occupancies and from all Boiler Rooms by walls and partitions constructed in compliance with the provisions of Section 185.390 (g.) (4). Such separation shall also be provided between unsprinklered Storage Occupancies and-those Mechanical Equipment Rooms containing central air fans.
    - 8) Storage Occupancy rooms located beneath an Assembly Occupancy shall be sprinklered or separated therefrom by a floor assembly having a fire resistance rating of not less than one hour.
    - C) No doors shall be required for doorways in the walls or partitions separating cloakrooms from Educational Occupancy classrooms where such cloakrooms are not more than 100 sq. ft. if unsprinklered or 200 sq. ft. if sprinklered.
    - D) Rooms with cased opening (no doors) extending from floor to ceiling may be considered as part of the classroom area and not be classified as cloak rooms.
  - 2) Special educational occupancies.

- A) All Special Educational Occupancies shall be individually enclosed and separated from the remainder of the building by walls or partitions constructed in compliance with the provisions of Section 185.390 (g)(4).

EXCEPTION: In buildings with open interior arrangement, as defined in Section 185.310 (c)(2) this requirement, as it applies to separations between two Special Educational Occupancies or between a Special Educational Occupancy and a primary egress aisle, may be waived provided such buildings comply with all provisions applicable to open interior arrangements.

- B) Woodworking (including painting and finishing areas), printing, automotive mechanics shops, and similar Special Educational Occupancy rooms possessing high fire intensity potential shall be sprinklered where such rooms are located in a basement; are located beneath any portion of a Type IV or V building subject to occupancy by pupils; or are open to a primary egress aisle where permitted under the preceding paragraph.

EXCEPTION: Fire detection may be substituted for the sprinkler protection required above where the room involved is located in an "unsprinklered" building of Type I, II, III and IV construction; is separated from the remainder of the building by walls and partitions complying with the provisions of Section 185.390 (g)(4) and by floor construction above having a fire resistance rating of not less than 1-hour (concrete pan construction with a 2 1/2 in. minimum floor thickness or wood joists with metal lath and plaster is acceptable); and the flame spread rating of the interior finish is not more than 25.

- C) Special Educational Occupancy rooms or spaces located beneath an Assembly Occupancy shall be sprinklered or separated therefrom by a floor assembly having a fire resistance rating of not less than one hour (or be of concrete pan construction with a 2 1/2 in. minimum floor thickness or wood joists with metal lath and plaster).

g) Walls and partitions

- 1) Scope and general rules.

- A) Established in this Subsection are the general requirements governing the construction of fire walls, fire partitions, smoke screens, and other walls and partitions required to have a fire resistance rating or to serve a special function such as enclosures for vertical openings, corridors, specific occupancies, etc. The requirements established in this Subsection shall apply to all buildings unless specific exception thereto is set forth elsewhere in this Part.
- B) Boiler Room walls shall comply with the provisions of Section 185.390 (e)(2).
- C) All walls and partitions included within the scope of this Subsection shall comply with the following general rules.
  - i) Where serving two or more specified functions (i.e. both a fire wall and a smoke screen, as both a storage occupancy enclosing or separating wall and a corridor enclosing wall, etc.), shall comply with the most restrictive requirements applicable to all such functions, unless specific exception thereto is set forth in Section 185.320 through 185.360 of this Subpart.
  - ii) Shall be constructed in compliance with the requirements applicable to the construction type of the building in which located, if more restrictive.
  - iii) Shall provide an effective retardant to the passage of heat, smoke and gases.
  - iv) Shall be provided with firestopping as required under Section 185.390.
- 2) Fire walls and fire partitions.
  - A) Fire walls and fire partitions shall comply with the fire resistance rating and other requirements established in the definitions therefore under Section 185.220 (c) and with the requirements of this Subsection.

EXCEPTION: That portion of a fire wall or partition located within and extending laterally across a corridor or a fire resistive passageway may be of 30 min. noncombustible construction with wired glass (1/4 inch minimum thickness) panels provided such panels are mounted in noncombustible frames; are not

more than 1296 sq. in. in area and the wired glass is firmly secured on all four sides. Doors located in the portion of a fire wall or partition covered by this Exception shall be considered as interior exit doors and shall comply with the applicable requirements of Section 185.370 (m) with particular reference to Section 185.370 (m)(6)(B)(iv).

- B) All openings in required fire walls and fire partitions shall be protected by approved, automatic Class A or Class B fire doors or approved automatic fire dampers except that those doors, installed in that portion of a fire wall or fire partition covered by the "Exception" permitted under Section 185.390 (g)(2)(A), may be of solid core wood, metal, or wired glass panel in metal frame construction.
  - C) Doors and dampers located in fire walls and fire partitions shall be of self-closing type where such function as part of a smoke screen, horizontal exit, Boiler Room enclosure, stair or ramp enclosure, etc. Those doors and dampers not specifically required to be of self-closing type may be maintained in the open position provided such are equipped with approved temperature sensitive closing devices and hardware and are so installed as to be easily inspected and maintained.
- 3) Smoke screens.
- A) Smoke screens, where required under this Part, shall comply with the requirements established in the definition therefor under Section 185.220 (c) and with the requirements of this Subsection.
  - B) Smoke screens shall be constructed of noncombustible materials or of combustible materials so assembled as to provide not less than a 30 minute fire resistance rating. All borrowed light openings and vision panels therein shall be glazed with clear wired glass not less than 1/4 inch thick. A structurally stable partition constructed primarily of wired glass panels mounted in wood framing (2 in. nominal) shall be acceptable for use as a smoke screen provided the exposed combustible surface area of the wood framing does not exceed ten percent of the total area of the smoke screen.

- C) Smoke screens shall provide an effective barrier to the passage of smoke, heat or gases from one side to the other side. Smoke screens shall extend from the floor tight to the underside of the floor or roof construction above, except that such may terminate at a fully noncombustible ceiling or at a partially combustible ceiling which has a fire resistance rating of not less than 30 minutes, provided the ceiling is continuous over the bordering rooms and spaces and the attics or concealed spaces above are fire stopped in compliance with Section 185.390 (h); and further that the ceiling is of such type and so constructed as to effectively prevent the passage of heat, smoke or gases from one side of the smoke screen to the other side through the attic or concealed space above. Wherever doubt exists as to the ability of a ceiling to so prevent the passage of heat, smoke or gases, the smoke screen shall extend through the ceiling tight to the underside of the floor or roof construction above.
  - D) The surface flame spread rating of all smoke screens shall not exceed 25.
  - E) Smoke screen doors shall be self-closing, of metal or solid core wood construction and shall otherwise comply with the requirements for horizontal exit doors as established in Section 185.370 (g) and 185.370 (m).
- 4) Special occupancy separation walls and partitions.
- A) Where, due to their somewhat higher fire intensity potential, certain occupancies (Assembly, Special Educational, Storage and Mechanical Equipment) are required under this Part to be separated from the remainder of the building, the walls and partitions providing such separation shall comply with the requirements of this Subsection unless otherwise specified in this Part.
  - B) Walls and partitions serving as required separation for Storage, Assembly and Special Educational Occupancy rooms and for Mechanical Equipment rooms shall comply with the provisions of Section 185.390 (g)(1) and shall-
    - i) Have not less than 1-hour fire resistance rating where located in unsprinklered basements and lead directly into an interior stair or ramp enclosure.

- ii) Have not less than 45 minute fire resistance rating where such occupancies are located in the basement of any unsprinklered building or otherwise located in any unsprinklered building more than two stories in height.
  - iii) Be of not less than 30 minute fire resistance rating where such are otherwise located or are protected throughout by automatic sprinklers.
  - iv) Be so constructed as to provide an effective retardant to the passage of heat, smoke or gases.
  - v) Shall extend from the floor tight to the underside of the floor or roof construction above except that such walls and partitions may terminate at fully noncombustible ceilings or at those partially combustible ceilings which have a fire resistance rating of not less than 30 minutes, provided such ceilings are continuous over the bordering rooms and spaces and the attics or concealed spaces above such ceilings are fire stopped in compliance with Section 185.390 (i) and provided further that such ceilings are of such a type and so constructed as to effectively retard the passage of heat, smoke or gases into the concealed space above.
- C) Doors in occupancy separating walls and partitions shall comply with the requirements for corridor access doors applicable to the required fire resistance rating of such occupancy separating walls or partitions, as set forth in Section 185.380 (c) except that such doors, where functioning as interior exit doors, shall comply with the requirements applicable thereto as set forth in Section 185.370 (m).
- D) Borrowed light openings shall be permitted in those occupancy separating walls or partitions required to have a fire resistance of 45 minutes, provided such openings are glazed with wired glass. No transoms or movable glass panels shall be permitted. Existing transoms, if any, shall be rigidly affixed in the closed position.

EXCEPTION: The following allowable exceptions to the foregoing requirement shall apply only to Assembly and Special Educational Occupancies or between approved corridors and exit stairs and ramps:

- i) In unsprinklered buildings, D.S., 40 oz. or plate glass (1/4 inch minimum thickness) may be used in place of the required wired glass provided the area of individual panels does not exceed 400, 500, or 600 sq. in. respectively and provided further that the flame spread rating of both outer surfaces of the occupancy separating walls involved and of the ceiling on both sides of such walls is not more than 75.
    - ii) In all sprinklered buildings and in all Plan A and 8 buildings with direct exterior exiting, the foregoing panel area limitations may be doubled.
  - E) Borrowed light openings in those occupancy separation walls or partitions required to have a fire resistance of less than 45 minutes shall comply with the applicable provisions of Section 185.390 (h)(5)(C).
  - F) Air ducts or enclosed shafts passing through occupancy separating walls and partitions shall not require internal opening protection unless such ducts are so installed as to produce a hazardous condition in adjacent rooms or spaces occupied by pupils. No other unprotected openings shall be permitted.
- 5) Corridor enclosure walls.
  - A) Walls and partitions required as enclosure for corridors and not included in the special requirements of 185.390(h)(2), 185.390(h)(3) and (h)(4) shall comply with the requirements of Section 185.380(c), 185.390(h)(1) and with the requirements of this Subsection.
  - B) Walls and partitions separating corridors from other Educational Occupancy rooms and spaces shall-
    - i) Be of 30-minute rated construction. Corridor walls or partitions consisting of metal lockers backed with 1/2 in. gypsum..(or equivalent fire resistive) wall board with glass panels framed in wood (2 in. nominal) shall be considered as complying with the foregoing requirement provided such glass panels comply with the limitations set forth in paragraph (C) below.

- ii) Extend from the floor below through any ceiling tight to the underside of the floor or roof construction above except that such walls and partitions may terminate at fully noncombustible ceilings and at those partially combustible ceilings having a fire resistance rating of not less than 30-minutes, provided all such ceilings are continuous over the bordering rooms and spaces, and the attics or concealed spaces above are fire stopped in compliance with Section 185.390 (j), and provided further that such ceilings are of such type and so installed as to effectively retard the spread of heat, smoke or gases into the concealed space above.
  - C) Corridor partitions and doors having a fire resistance rating of 1/2 hour or less may have louvers up to 24 in. above the floor. No other louvers or openable transoms shall be permitted in corridor partitions unless protected by a UL listed fire damper. Borrowed light openings in corridor enclosure walls and partitions required to have a fire resistance rating of less than 45 minutes shall be secured on all four sides and glazed with wired glass subject to the allowable exceptions set forth below.
    - i) In unsprinklered buildings, D.S., 40 oz., or plate glass (1/4 inch minimum thickness) may be used in borrowed light openings provided the area of individual panels is not more than 600, 800 and 1000 sq. in., respectively, provided the flame spread rating is less than 75 on both sides.
    - ii) In all sprinklered buildings, Plan 8 buildings and Plan A buildings with either a direct exterior exit or a secondary means of escape, the foregoing panel area limitations may be doubled.
  - D) Doors in corridor enclosing walls or partitions shall comply with the applicable requirements established in Section 185.380 (c) and 185.370 (m).
- h) Protection of vertical openings.
- 1) All vertical openings as defined in Section 185.220 (c) shall be enclosed or otherwise protected in compliance with the requirements of this Subsection except where unenclosed vertical openings are specifically permitted under Section 185.320 through 185.360 of this Subpart. A room or space with

a high ceiling or roof height, such as frequently found in Class A and B Assembly Occupancies, shall be considered as a vertical opening and subject to compliance with the requirements of this Subsection when the room or space extends upwards through more than one floor level and is located in the same fire area with the adjacent or bordering rooms or spaces.

2) Stairs and ramps.

- A) Interior exit stairs and ramps, as specified under Section 185.370 (c) and 185.370 (d), shall be enclosed by walls or partitions extending from the bottom of such stairs or ramps continuously upward to the floor or roof construction above the top story served by such exit stairs or ramps. Interior exit stairs and ramp enclosures may be offset at various floor levels provided the construction of the floor assembly of such floor levels has a fire resistance rating at least equivalent to that required for the enclosure and that such offsets are so separated from the remainder of the building as to provide protection equivalent to that provided for enclosures without any such offsets.
- B) The walls or partitions enclosing exit stairs or ramps shall be so arranged as to provide a continuous, protected path of travel to a place of safe refuge or to interior exit doors providing access into a fire resistive passageway.
- C) The enclosing walls, partitions and ceilings for interior exit stairs and ramps shall be so constructed as to provide the following fire resistance ratings (including attics and concealed spaces above ceilings):
  - i) 45-minute fire resistance rating for stairs and ramps serving not more than four floor levels (including basement, if any) in an unsprinklered building or six floor levels in a sprinklered building.
  - ii) 1-hour resistance rating for stairs and ramps not included within the scope of the preceding Paragraph, or included under Section 185.390(g)(4)(8)(i).

- D) All borrowed light openings shall be glazed with clear wired glass not less than 1/4 inch thick in noncombustible frames. Panes or panels unlimited in size shall be permitted only for enclosure walls and partitions between approved corridors and stairs or ramps required to have a fire resistance rating of not more than 45 minutes. Panes or panels in enclosure walls and partitions required to have a higher fire resistance rating shall be limited to 1200 sq. in. in area.
  - E) Openings into interior exit stair or ramp enclosures other than those specified in Section 185.370 (c)(11) shall not be permitted. Such doors shall comply with the applicable provisions of Section 185.370 (m).
  - F) Stairs and ramps not serving as a required exit or a required path of travel to an exit shall be enclosed in compliance with the requirements established for interior exit stairs and ramps except that such stairs or ramps, where passing through one floor level only, shall require enclosing construction at one level only.
- 3) Elevators and dumb waiters.
- A) Elevators and dumb waiters shall comply with the enclosure requirements of Section 185.390 (h)(2) except as otherwise provided herein.
  - B) Elevator doors shall be of an approved type providing a fire resistance rating at least equivalent to that required for the interior exit doors providing access into enclosed exit stairs and ramps.
  - C) Doors in dumbwaiter shaft enclosures shall be of approved sliding or hinged type and so constructed as to provide fire resistance rating equivalent to that required for interior exit doors leading into enclosed exit stairs. The doors shall be maintained in the closed position and shall be operable only when the car is at the opening.
- 4) Ventilation and utility shafts.
- A) All vertical air ducts and shafts, and other utility shafts, shall be enclosed by walls and partitions having a fire resistance rating of not less than 45 minutes when passing through one but not more than five floor levels unless protected by UL listed fire damper; and one hour when passing through more than five floor levels.

- B) Air ducts or shafts opening into an attic space shall be protected at the top by an approved automatic fire damper or shall be connected with (and thereby separated from the remainder of the attic by) approved ducts constructed of no less than 22 U.S. Standard gauge for steel and 20 B.S. gauge for aluminum.
- C) Openings in vertical air ducts and shaft enclosures shall be protected in compliance with the applicable requirements of NFPA 90A-1963. The following exceptions shall apply, except for those locations noted in Section 185.370 (c)(11)(B).
  - i) No protection shall be required for those duct or shaft openings, the tops of which are located less than 4 ft. above the floor level immediately below.
  - ii) No protection shall be required for openings in those ducts or shafts which serve one-story only.
  - iii) No protection shall be required for openings in those air ducts or shafts which are connected with and automatically controlled by primary air fans installed in compliance with the applicable provisions of Section 185.475.
  - iv) No protection shall be required for those openings less than 144 sq. in. in size when located in an unsprinklered building and 288 sq. in. in size when located in a sprinklered building.
- 5) Trash chutes.
  - A) Trash chutes shall be enclosed in compliance with the provisions of Section 185.390 (h)(4)(A) with all openings into such chute (except for opening at bottom) protected with approved self-closing Class B or C fire doors.
  - B) Automatic sprinklers shall be provided at the top of all trash chutes and in those trash collection bins or rooms beneath such chutes which are more than 20 sq. ft. in area.
- 6) Other vertical openings. Vertical openings, not heretofore regulated, shall be enclosed or otherwise protected in such a manner as to effectively control the spread of heat, smoke and gases between stories and to provide protection equivalent with that protection specified herein for other vertical openings.

- i) Firestopping
  - 1) Walls and partitions.
    - A) All wood and stud partitions and other walls or partitions which are partially or wholly of combustible construction with hollow interior space shall be fully fire stopped at the ceiling of each story by a noncombustible plate or by a 2 in., nominal dimension, wood plate extending the full width of the stud, or by other construction equivalent thereto.
    - B) All walls and partitions, with the exception of masonry walls, shall be fire stopped at each floor of each story by construction equivalent to that of the floor construction itself.
    - C) All internal spaces between combustible wainscoting or paneling (when such is permitted) and the wall or partition to which it is attached shall be so fire stopped as to divide such spaces into compartments extending not more than 10 ft. in any direction.
    - D) All spaces around ducts, pipes, conduits and other fixtures or equipment passing through walls and partitions shall be fire stopped or otherwise so constructed as to prevent the passage of fire, heat or smoke through such spaces.
  - 2) Attics and other concealed spaces above ceilings.
    - A) Firestopping, as required herein.- shall be constructed so as to completely subdivide the attics and other concealed spaces above ceilings involved into separate compartments, and, in so doing, to provide an effective barrier to the spread of heat, smoke and gases from one compartment to the next. Such firestopping shall be tightly and continuously connected with the surfaces providing the enclosure for the attic or-concealed space to be subdivided and shall fit tightly around any ducts, pipes, conduits, structural members, etc. passing there through. Ducts passing through such firestopping shall not require internal protection unless the ducts have unprotected openings directly into one or more compartments. Access panels and doors through required firestopping shall be continually locked, provided with self-closing devices or otherwise so constructed and maintained as to reliably assure that the panels and doors will be kept in the closed position.

- B) Firestopping shall be constructed of noncombustible materials (corrugated steel, transite, 3/8 in. gypsum wallboard, etc.) or shall be 30 minute rated construction having a flame spread rating of not more than 25.
- C) The location of firestopping shall be coordinated with the arrangement of the required exits and primary paths of exit travel thereto. Wherever practical, corridor walls shall be extended through the ceilings to the floor or roof construction above and thereby, utilized as part of a required firestop. Smoke screen across primary paths of exit travel shall be extended up and thereby be utilized as part of the required firestopping for the attic or concealed spaces above as specified in 185.390 (g)(3)(C).
- D) An attic or a concealed space above a ceiling, when the attic or space is unsprinklered, shall be subdivided by firestopping into separate compartments not more than-
  - i) 5,000 sq. ft. with the maximum dimension not more than 100 ft., when the roof or floor construction above is combustible and the exposed (top) surface of the ceiling construction below consists of combustible fiberboard or other material having a flame spread rating of more than 200.
  - ii) 10,000 sq. ft. with the maximum dimension (measured in any direction) not more than 120 ft., when the roof or floor construction above is noncombustible and exposed (top) surface of the ceiling construction below is as specified under paragraph (i)(2)(D)(i) above.
  - iii) 15,000 sq. ft. with the maximum dimension (measured in any direction) not more than 200 ft., when the floor or roof construction above is combustible and the exposed (top) surface of the ceiling construction below has a flame spread rating of not more than 200. Wood or metal lath and plaster ceilings attached to wood ceiling joists would be a typical example of a ceiling qualifying under this paragraph.
- E) No area or dimensional limits, other than those imposed by a building's fire area limitations, shall be placed on those attics or concealed spaces above ceilings which are not regulated by paragraph (D) above or which are sprinklered throughout.

j) Flame spread limitations

- 1) The terms "flame spread rating" and "interior finish" shall have the meanings defined under Section 185.220 (c), subject to the more detailed definitive requirements and specifications set forth in this Subsection.
- 2) Interior finish.
  - A) The term "interior finish" is used in this Part solely to identify those exposed surfaces of a building which are subject to flame spread limitations. The interior finish of a building, or portion thereof, shall include all surfaces (exposed to view in occupied rooms or spaces) of walls and partitions including trim and doors located therein; of ceilings and the underside of floor and roof assemblies (when no ceilings are provided); of bulletin or display boards rigidly attached to a wall or partition; of those lockers and cabinets which are built-in, rigidly affixed to, or closely backed up to walls and partitions which thereby, hide or cover surfaces which otherwise would be considered as part of the interior finish.
  - B) The exposed surfaces of floors shall be excluded from consideration as interior finish. The flame spread rating of interior walls and ceiling surfaces is not considered to be affected by ordinary paint and wall coverings applied thereto. Highly flammable finishes such as lacquer and shellac are not considered as ordinary.
  - C) Curtains, draperies and other similar furnishings of a decorative nature shall likewise be excluded from consideration as interior finish and shall be governed by the applicable provisions of Section 185.390 (k).
- 3) Basic rules.
  - A) The use or existence of interior finish materials with flame spread ratings in excess of 200, when tested in accordance with the applicable requirements of ASTM E-861, is prohibited in any occupied room or space.
  - B) Notwithstanding the flame spread rating, interior finish trim materials and other surface treatments exposed to occupied areas which produce a quantity of smoke or toxic fumes sufficient to affect life safety, shall not be permitted in any occupied room or space.

- C) The exposed wood surfaces of heavy timber construction and of tongue and groove planks (2 in. nominal minimum thickness) supported by noncombustible or heavy timber members shall be considered to have a flame spread rating of 75.
  - D) Plastics used as a construction material or as an interior finish material shall be subject to the same flame spread tests and ratings as other materials.
  - E) In unsprinklered rooms or spaces, 10% of the total wall area (including doors, door and window casings, and other trim) and 5% of the total ceiling area of a room or space shall be permitted to have a flame spread rating of not more than 200 even though a lower flame spread rating is required for such room or space. In sprinklered rooms or spaces, the figures established in the preceding sentence may be increased to 20% and 10%, respectively.
  - F) In existing buildings, interior finish surfaces having a flame spread rating in excess of that permitted under this Part shall be replaced or shall be coated with an approved fire retardant paint or coating applied in such quantity as to reduce the flame spread rating of the existing surface to within the limits permitted under this Part. No fire retardant paint or coating shall be considered as approved unless such is listed or approved by any accepted testing laboratory. Such paint or coating shall be applied in strict conformance with the manufacturer's instructions. The applicator shall be required to submit to the School Board a signed certificate stating that the approved fire retardant paint or coating has been applied in accordance with the requirements of this Part and specifically identifying the surfaces to which such has been applied. Such certificate shall be maintained on file by the School Board.
- 4) Flame spread limitations.
- A) The flame spread rating of the interior finish of Assembly Occupancies shall not exceed limitations established therefor under Section 185.360 (f) or under this Section, whichever is more restrictive.
  - B) The flamespread rating for the interior finish of other occupied rooms and spaces shall not exceed the limitations established in Appendix A, Table K. Area

limiting figures shall apply to that area within rooms, in contrast to the area of spaces (see definitions therefor under Section 185.220 (c)).

- C) In general terms, interior finish materials in the form of acoustic tiles or wall or ceiling boards, as well as plaster, can be grouped into two categories, as follows:
  - i) Those having a surface flamespread rating of 25 or less, thereby qualifying them as NONCOMBUSTIBLE interior finish materials. Included in this category are plaster, acoustic plaster on noncombustible surfaces, gypsum and plaster boards, mineral boards, glass fiber tile, metal ceilings, etc. Some wood and cellulose fiber tiles also are included, but these tiles must be positively identified by the label of an approved testing laboratory as having a flamespread rating of 25 or less.
  - ii) Those having a surface flamespread rating of more than 25, classifying them as COMBUSTIBLE. Included in this category are most cellulose fiber boards, wood fiber boards, plywood, pressed fiberboards, wood particle boards, cloths, plastic panels, acoustic plaster on combustible surfaces, etc.

k) Decorative materials

- 1) Established in this Subsection are the requirements governing the combustibility of drapery, curtains loosely attached wall coverings, cloth hangings and other similar materials primarily used for decorative purposes which are excluded from consideration as part of the interior finish of a room or space. Such materials shall be referred to as "decorative materials."
- 2) All decorative materials shall be noncombustible or flameproof in accordance with the provisions of Section 185.390 (k)(3) below, where located in a required exit; in a required primary path of travel thereto; in an Assembly Occupancy room or space; and in those Educational Occupancy and Special Educational Occupancy rooms or spaces having a capacity of more than 60 persons if unsprinklered and 100 persons, if sprinklered.

- 3) The flame proofing of decorative materials and the tests for determining the rate of spread of flaming or smoldering combustion shall be carried out in accordance with the NFPA 701-1951 or with other accepted standards. Unless the applied flame proofing has been approved by an accepted testing laboratory as being of a permanent nature, the flame proofed material shall be tested annually and the flame proofing treatment renewed as necessary in a manner acceptable to the Enforcing Authority. A dated certificate, signed by the flame proofing applicator and identifying the flame proofing agent used and the material protected, shall be maintained on file and available for reference at all times.
- 1) Structural stability
  - 1) No building or portion thereof shall be permitted to be used as a school unless such is structurally safe for its intended occupancy and is in compliance with the provisions of this Subsection.
  - 2) No load greater than that for which the floor, roof, or other structural element involved is designed, shall be permitted to be placed thereon.
  - 3) All construction, alteration and repair work, which directly or indirectly affects the structural stability of a building, or portion thereof, shall be designed by a licensed architect or engineer under the applicable laws of the State of Illinois.
  - 4) Where the structural stability of a building or portion thereof is deemed by the Enforcing Authority to be questionable, such building or portion thereof shall be thoroughly investigated by an architect or engineer and a report establishing the results of such investigation including the recommended corrective measures shall be submitted to the Enforcing Authority.
  - 5) The structural design of all buildings and structures and their foundations shall comply with the provisions of Article 7 of the Third Edition (1960) B.O.C.A. Basic Building Code published by the Building Officials Conference of America, Inc. (with supplements published in 1961 and 1962).
  - 6) Materials and tests.
    - A) The quality, workmanship and requirements for all materials and the minimum specifications for enclosure walls and wall thickness hereafter used in the construction of buildings and structures shall comply with Article 8 Part A "Materials and Tests:" of the Third

Edition (1960) B.O.C.A. Basic Building Code, published by the Building Officials Conference of America, Inc. All materials and methods of construction shall conform to the approved rules and the Standards for Materials and Tests of accredited authoritative agencies and the requirements of accepted engineering practice listed therein.

- B) Steel, masonry, concrete, gypsum, and lumber construction shall comply with the requirements of Article 8--Part "B" "Steel, Masonry, Concrete, Gypsum, and Lumber Construction" of the Third Edition (1960) B.O.C.A. Basic Building Code, published by the Building Officials Conference of America, Inc.
  - C) Building Enclosures, Walls and Wall Thickness shall comply with the requirements of Article 8--Part "C" "Building Enclosures, Walls and Wall Thickness" of the Third Edition (1960) B.O.C.A. Basic Building Code, published by the Building Officials Conference of America, Inc. Boiler room walls shall be designed to withstand a 20 pound horizontal pressure. Other fire walls and partitions of 1 hour or more rating, 10 pounds horizontally.
- m) Lead paints and other surface coating materials.
- 1) Lead paints, varnishes, lacquers and other surface coating materials containing more than .06 of 1% of lead content by weight of non-volatile materials shall not be used for decorating or re-decorating exposed interior surfaces of schools.
  - 2) Loose or peeling paint shall be tested in accordance with ANS No. C66.1, dated January 1973. If it is determined that the quantity of lead or its compounds is greater than 1.0 milligram per square centimeter, it shall be removed and repainted. which establish the requirements for the connection of such supplies to potable water systems including an open air gap connection between such potable water supply and tank.

Section 185.395 Sprinkler Protection, Detection and Alarm Systems

a) Scope

- 1) Established in this Section are the general requirements for sprinkler systems, fire detection and alarm systems and fire extinguishers.
- 2) The requirements of this Section shall be considered to apply to all buildings or fire areas unless otherwise specified under Sections 185.320 through 185.360 of this Subpart.
- 3) As specified under Section 185.310 (d), every fire area shall be classified as either "sprinklered" or "unsprinklered." Every fire area not qualifying for "sprinklered" classification, as defined under Section 185.395 (b), shall be classified as "unsprinklered" and shall comply with the requirements of Section 185.395 (c).

b) Sprinkler protection

- 1) A building or fire area to be classified as "sprinklered" shall be protected throughout by an approved automatic sprinkler system in compliance with the provisions of Section 185.395 (b)(4) of this Part except that approved fire detection conforming with the applicable provisions of Subpart E may be substituted for such sprinkler protection in the areas specified under paragraph (A) through (C) below without adversely affecting the sprinkler classification of a building or fire area.
  - A) In those normal Education Occupancy-classrooms which comply in full with all of the following limitations:
    - i) Are individually separated from the remainder of the building or fire area by walls and partitions complying with the applicable provisions of Section 185.390 (g).
    - ii) Have an interior finish flame rating of not more than 75;
    - iii) Are not located in a Type V building more than one story in height or in a Type IV building more than two stories in height unless provided with direct access to an exterior exit, a secondary means of escape or at least one outside window having a least opening dimension of 30 in. This limitation shall apply to only those classrooms having a capacity of more than 20 persons;

- iv) Are not located in a basement unless provided with direct access to an exterior exit or an approved secondary means of escape;
  - v) Are not located in a Type V building more than one story in height if such building has any combustible exterior walls or interior bearing walls or more than two stories in height if such building has noncombustible interior bearing and exterior walls; and
  - vi) Are not located directly beneath a Class A or B Assembly Occupancy unless separated therefrom by a floor assembly having a fire resistance rating of not less than one hour (or be of concrete pan construction with a 2 1/2 in. minimum floor thickness or wood joists with metal lath and plaster.)
- B) In those unoccupied attics which comply in full with all of the following limitations:
- i) Are separated from all occupied areas by ceilings and walls or partitions of fully noncombustible construction or of partially combustible construction having a fire resistance rating of not less than 30 minutes with fire exposure from the side exposed to the occupied areas. Such separating construction shall be such as to provide an effective retardant to the passage of smoke and gases from one side to the other. No ceiling or wall grilles or other unrestricted openings through such separating construction shall be permitted. Air ducts and shafts passing there through shall comply with the requirements of Section 185.390 (h)(4);
  - ii) Are fire stopped in compliance with the requirements of Section 185.390 (i);
  - iii) Are not used as an open plenum.
- C) In those Assembly Occupancy rooms (excluding stages, projection rooms, dressing rooms, Storage and Mechanical Occupancy rooms, kitchens and other rooms or areas having similarly higher fire hazards) which comply in full with all of the following limitations:

- i) Have an interior finish flame rating of not more than 75 for all walls and 25 for all ceilings. Exposed heavy timber (Type III) construction shall be considered to comply with this ceiling flame spread limitation;
  - ii) Are fully separated from the remainder of the building by walls and partitions complying with the applicable provisions of Section 185.390(g) and Section 185.360 of this Subpart;
  - iii) Are not located in a basement or above the street floor of a Type V building;
  - iv) Are not located above the second story of a Type II, III or IV building except that Class C Assembly Occupancy rooms may be located on the third or fourth floor of such a building, provided each such room has direct access to approved exits which have a capacity sufficient to serve 50 percent of the room's total capacity.
- 2) Where allowances or credits are provided for sprinkler protection in certain specified areas, and not specifically restricted to a "sprinklered" building or fire area, such allowances shall apply only when the specified areas are sprinklered throughout in compliance with the requirements of Section 185.395 (b)(4).
- 3) Sprinkler protection may be substituted without reservation for required fire detection. Reverse substitution, however, shall not be permitted except as specifically allowed under Section 185.395 (b)(1) or in Sections 185.320 through 185.360 of this Subpart.
- 4) Design, installation and maintenance requirements.
  - A) Except as otherwise specified herein, all sprinkler systems shall be designed, installed, tested and maintained in compliance with the requirements established in NFPA 13-1963. All devices and materials shall be UL or FM approved where approved devices or materials are called for therein. The term "authority having jurisdiction" as used therein shall, under this Part, refer to the Enforcing Authority.

- B) All required sprinkler systems shall be installed by contractors specifically experienced in the design and installation of such systems. Such contractors shall be required to prepare complete and detailed shop drawings for all sprinkler systems.
- C) The spacing and location of sprinklers and the sizing of sprinkler supply and distribution piping shall comply with those requirements of NFPA 13-1963 applicable to light hazard occupancies, except that those requirements applicable to ordinary hazard occupancies shall be complied with for installations in Storage and Mechanical Occupancy rooms and spaces and in those Special Educational Occupancy rooms or spaces included within the scope of Section 185.390 (f)(2)(B).
- D) Sprinkler system water supplies. Every sprinkler system shall be provided with a reliable water supply in compliance with the applicable requirements of NFPA 13-1963 and NFPA 24-1963, subject to the following requirements and allowable exceptions:
- i) The minimum amount of water available solely to supply automatic sprinklers shall be the total required to supply all of the heads in the largest sprinklered area, computed at 20 gallons per minute per head, but need not be more than any of the following amounts at the stated residual pressure at the highest sprinkler head: 300 gpm for 20 minutes at 15 psi pressure; 250 gpm for 20 minutes at 20 psi pressure; 200 gpm for 20 minutes at 25 psi pressure.

EXCEPTION: A pressure tank shall be considered as an acceptable sprinkler system supply provided such tank complies in full with the following requirements:

The tank is so designed and installed as to be capable of providing not less than 2,000 gallons of water at a residual pressure of not less than 15 psi at the highest sprinkler head; the tank is provided with approved low air pressure and low water level switches, which are installed and wired as part of the building fire alarm system in such a manner as to actuate an alarm system trouble signal whenever an abnormal condition occurs; the tank is installed in a room or space not subject to freezing conditions or to use by pupils or other unauthorized personnel; the tank otherwise complies in full with the requirements of Par. 2500 of NFPA 13-1963.

- ii) Where water for sprinkler systems is supplied from water works systems or other exterior sources by means of underground mains, such mains shall be installed in compliance with the applicable requirements of NFPA 24-1963, such mains shall not be less than 411 in size except that 3" mains shall be permitted where such systems supply a total of not more than 20 sprinklers.
  - iii) A single building water service main connected with a reliable water source may serve as supply to both the building's domestic system and its sprinkler, provided such service otherwise complies with the provisions of this Subsection and the sprinkler system supply connection is upstream from the primary gate valve (within the building) controlling the domestic system. Flow and flow pressure available at point of sprinkler system connection shall be adequate to supply the building's peak domestic demand plus that specified as minimum under paragraph(b)(4)(D)(i) of this Subsection.
  - iv) Small, partial sprinkler system installations may be supplied directly from a building's domestic system piping provided each such system complies in full with the following requirements: The domestic system pressure is adequate to provide not less than 15 psi (neglecting internal friction loss in the sprinkler piping itself) at the uppermost sprinkler head with normal maximum domestic usage; the total number of sprinklers supplied from a connection to domestic piping shall in no case exceed 30 sprinklers, with not more than 15 sprinklers located on any one floor or in any one fire area; each system supplied from domestic service piping shall be provided with an approved OS&Y gate valve and flow switch with supervision and alarm facilities complying with par. "G" and "H" below.
  - v) All sprinkler system water supplies shall further comply with the applicable provisions of Subpart F of this Part.
- E) System valves. System valves or flow switches shall be UL or FM approved. Each system shall be controlled by an .accessible outside screw and yoke (OS&Y) valve. Such valve should be so located or protected as not to be susceptible to tampering by pupils or the public.

- F) Fire department pumper connections. Fire department connections shall not be required for systems having less than 30 sprinklers. A single 2 1/2 in. hose pumper connection shall be permitted for systems having less than 100 sprinklers provided not more than 50 sprinklers are located in a single fire or smoke area.
  - G) Supervision. The occurrence of low water level conditions in pressure or storage tanks and of low air pressure conditions in dry pipe systems and pressure tanks, and the closing of manual valves controlling water supply to sprinkler systems shall automatically cause a fire alarm system trouble signal sound. Such shall be accomplished by the use of approved devices installed and wired as part of the building fire alarm system.
  - H) Alarm. Every sprinkler system with more than 4 heads shall be provided with an approved alarm device. Such devices shall be installed and wired as part of the building fire alarm system in such a way as to actuate the buildings' fire alarm signal whenever water flows through the sprinkler system.
- c) Fire detection
- 1) Every building not qualifying for classification as "sprinklered" under Section 185.395 (b)(1) shall be provided with an automatic fire detection system installed in compliance with the applicable provisions of this Subsection and Subpart E of this Part.
  - 2) Unless sprinklered, automatic fire detection shall be provided in the following locations in buildings required to have a fire alarm system, unless otherwise specified in Sections 18S.320 through 185.360 of this Subpart:
    - A) All Storage and Mechanical Occupancy rooms or spaces.
    - B) All Special Educational Occupancy rooms or spaces.
    - C) All attics and other concealed spaces above ceilings where the floor, roof or ceiling construction is combustible. This requirement shall not apply to those attics and concealed spaces in multi-story buildings that have an area of less than 2,000 sq. ft. or to those attics over a one-story building which have an area of less than 5,000 sq. ft.

- D) All Assembly Occupancy rooms or spaces having an interior finish flame spread rating of more than 75.
  - E) All stages, projection rooms, dressing rooms, storage rooms and kitchens which are part of or accessory to Assembly Occupancy rooms.
  - F) At the top of all stairwells and beneath the ceiling of each story (including basement) at point of entrance to interior stairs and ramps which are not fully enclosed or otherwise protected in compliance with the applicable provisions of Section 185.390 (h).
- 3) All fire detection systems shall be so installed as to automatically actuate the building fire alarm system, as provided for under Subpart E.
- d) Fire alarm systems
- 1) Every school with over 5,000 sq. ft. gross area or with more than one occupied floor level shall be provided with an approved fire alarm system complying with applicable provisions of this Subsection and Subpart E. Wherever, possible, systems should transmit alarms automatically to the fire department or to an approved central station service.
  - 2) Each fire alarm system shall be cross-connected with the building's fire detection and sprinkler system in compliance with the requirements of this Subsection and Subpart E and Section 185.475.
  - 3) Manual alarm sending stations.
    - A) Manual alarm sending stations shall be located so as to be readily visible and accessible and shall be of the same general type throughout the school.
    - B) Stations shall be near each main exit and in the natural path of escape from fire. Not less than one station shall be provided on each floor in every fire area, except that 50 ft. and one flight of stairs may be traversed to reach a station on another story in the natural path of escape.
    - C) Stations shall be so located that not more than 100 ft. of corridor or primary egress aisle have to be traversed to reach a station in an unsprinklered building and 150

ft. in a sprinklered building. In addition, a station shall be provided on the auditorium side of the proscenium wall in each Class A or B assembly room and in or adjacent to boiler rooms serving spaces with a capacity over 250 persons.

4) Alarm horns.

- A) Alarm signals shall be horns with a decibel rating of not less than 10 ft. and shall be distributed so as to be clearly heard in all occupied parts of the building. (This generally will mean signals not more than 200 ft. apart on each story and in boiler room, auditorium, gymnasium, swimming pool rooms, locker rooms, shower rooms and similar areas with high noise level.)
- B) Horns shall be used for fire alarm purposes only, and the same signal shall be used for drills as for actual alarms.

e) Fire extinguishers

- 1) UL listed fire extinguishers shall be provided in every school in accordance with the provisions of NFPA 10-1963.
- 2) No vaporizing liquid extinguishers using carbon tetrachloride, chlorobromomethane or any other chemicals of equivalent toxicity shall be permitted in any building.
- 3) One extinguisher having an UL classification of not less than 2-A shall be provided on each side of those stages included within the definitive limitations of (e)(1).

SUBPART D: HEATING, VENTILATING AND INCINERATORS

Section 185.400 Scope

- a) This Subpart establishes the minimum requirements necessary to protect the health and safety of pupils against improper and unsafe heating, ventilating and incinerator installations and their accompanying by-products.
- b) Fuel-burning installations, fuel supply and distribution facilities shall also comply with Sections 185.390 (e)(1), 185.485 and 185.720 and with other applicable requirements of this Part, where such are more restrictive than those established in this Subpart.

Section 185.405 Heating Capacities

- a) Each heating and ventilating system shall be so installed and of such capacity as required to maintain the following minimum room temperatures during all periods of occupancy:
  - 1) Gymnasiums, playrooms, shops +65° F
  - 2) Kitchens +68° F
  - 3) Toilet rooms +70° F
  - 4) Shower rooms, drying rooms, natatoriums +75° F
  - 5) All other assembly, educational and special educational spaces and rooms +72° F
- b) Room temperatures shall be measured at the center of each room, 5 ft. above the floor.
- c) Heat losses.
  - 1) Where there is evidence of underheating in a space, room or a section, or in the total building, heat losses for such rooms or spaces shall be calculated on the basis of the lowest recorded outdoor temperature for the past ten years, as scheduled in Col. 7, Table 1, Chapter 25 of the ASHRAE Guide, 1963.
  - 2) Heat losses shall be calculated on the basis of a 15 mph wind.
  - 3) Heat losses shall be calculated for each room or space using the heat loss methods as outlined in Chapter 25 of the ASHRAE Guide, 1963. Allowances shall be made in system capacity for heating outdoor air which is introduced when room cooling by outdoor air is not required and for heating of domestic hot water and swimming pool water which will be heated at the time of maximum heating load. No allowances shall be made for heat gain from pupils, lighting motors, equipment or solar radiation.
  - 4) Heating arrangements in rooms and spaces and boiler-burner and furnace-burner capacities shall be increased as indicated by above calculations to insure compliance with above standards.

- d) Air handling equipment provided to introduce outdoor air for ventilating purposes or to replace exhausted air or to avoid negative pressure at fuel burners shall be designed to continuously heat the required volume of incoming outdoor air from design outdoor temperature to design room temperature when room cooling by outdoor air is not required and room or space is occupied.

Section 185.410 Methods of Heating

- a) Heat for schools shall be provided by systems utilizing gravity or forced circulation hot water, low pressure steam, warm air, radiant panels, gravity or forced circulation space heaters, or electric heating units or panels.
- b) Heating systems serving those Assembly, Educational and Special Educational Occupancy rooms or spaces having a capacity of more than 20 persons shall be so arranged that the temperature in each such room or space may be individually controlled, independent of all other rooms or spaces.
- c) Exposed surfaces of heating and/or ventilating equipment, piping, hangers, etc., which may be touched by occupants shall not exceed 250° F except in boiler, furnace, incinerator, equipment, transformer and utility rooms, tunnels, manholes, etc.
- d) All direct-fired heating and/or ventilating units shall be of the "blow-through" type so designed and installed as to assure that any leakage in the combustion chamber shall be into the chamber itself, regardless of location or arrangement of the combustion chamber.

Section 185.415 Unit Ventilators and Unit Heaters

Unit ventilators and unit heaters and their installations shall conform to all applicable requirements of the following:

- a) ASAZ21-16-1957 (gas unit heaters)
- b) IUHA-AMCA Bulletin 10-1950 (steam unit heaters)
- c) ASHRAE Standard 45-1955 (direct-fired unit heaters)
- d) ASHRAE Standard 53-1934 (unit ventilators)

Section 185.420 Space Heaters

- a) Solid fuel space heaters shall have an output of not more than 95,000 BTUH and shall be tested and rated in accordance with the provisions of USBS Division of Trade Standards #T-3443 and shall be modified as approved for the use of wood, bituminous coal, or coke. Combustible flooring under and within 12 in. of the outside of the heater casing shall be protected by a metal bound pad made of noncombustible material, equivalent in fire resistivity to 1/2 in. cement asbestos board.
- b) Oil-fired space heaters shall burn No. 1 or lighter oil and shall comply with the provisions of CSD 101.43-1943 (vaporizing oil burners).
- c) Gas-fired space heaters shall comply with the provisions of NFPA 54-1959.
- d) The maximum temperature of the exposed surfaces of the space heater casings or shields shall not be permitted to exceed 180° F.

Section 185.425 Furnaces and Safety Controls

- a) Furnaces and their installations shall conform to all applicable requirements of the following except as otherwise noted herein:
  - 1) National Warm Air Heating and Air Conditioning Association (NWAH & ACA) Manual No. 7, 4th Edition (1953) and Manual No. 9, 6th Edition (1959) (warm air heating).
  - 2) NFPA 90A-1961 and 90B-1961 (warm air heating and ventilating)
  - 3) CSD 195-1957 (pressure and rotary oil burners and furnaces)
  - 4) CSD 113-1951 (vaporizing burners and floor furnaces)
  - 5) NFPA 54-1959 (gas appliances)
  - 6) ASA Z21.34- 1958 (duct furnaces)
  - 7) ASA Z21.13.2-1958 (gravity or forced air gas furnaces)
  - 8) CSD 109-1944 (solid fuel forced air furnaces)
  - 9) ASHRAE Standard 45-1955 (heavy duty furnaces)
  - 10) CSD 104-1949 (vaporizing oil burners and furnaces)
  - 11) NWAH & ACA Manual No. 5-1954 (gravity warm air furnaces)
- b) Fire dampers shall not be required unless otherwise specified in this Part.
- c) Each furnace blower of a multiple furnace blower installation shall have a manual or automatically controlled air outlet damper with exterior indicating quadrant. Each manual damper shall have an exterior means of locking damper blades in any position.
- d) Every warm air furnace shall be provided with the following minimum safety devices:
  - 1) Safety air stat set at a point not more than 20% higher than setting of operating control and so installed as to automatically stop its associated burner or burners serving individual furnaces.
  - 2) For multiple furnace installations where operating air stat or air stats are separated from each furnace by a damper, each furnace shall be provided with two (2) air stats.

- e) Each group of one or more air stats shall have an adjacent duct thermometer.

Section 185.430 Boilers and Safety Controls

- a) Low pressure steam and hot water boiler installations shall conform to all applicable requirements of ASME Section IV "Low Pressure Boiler Code, 1962 Edition," except as follows:
  - 1) Return loop connections, as much as 10 in. below the water line, shall be permitted where a "Y" connection or a very short horizontal connection is used.
  - 2) Oil heaters of the submerged or external type shall be permitted for use in pre-heating fuel oil.
  - 3) Labels identifying the function served by valves shall not be mandatory.
- b) Boilers and boiler installations shall be selected on IBR or SBI rating basis and shall also comply with all applicable requirements of the following, unless exception thereto is otherwise set forth in this Part:
  - 1) ASA,Z21.13.1-1958 (steam and hot water gas boilers)
  - 2) ABMA, "Standard Test Procedure for Packaged Fire Tube Boilers-1959"
  - 3) SBI, "Steel Boiler Institute Rating Code for Steel Boilers-1958"
  - 4) CSD, R157-50-1950 (steel boilers)
  - 5) ASME "Miniature Boilers"
  - 6) ASME-Section IV, Rules for Construction of Low Pressure Heating Boilers.
  - 7) ASME-Section I-Rules for Construction of Power Boilers, 1965 Edition.
  - 8) ASME-Section VIII, Unfired Pressure Vessels, 1965 Edition.
- c) Every steam and every hot water boiler shall be provided with the following safety devices:
  - 1) A low-water cut-off to automatically stop fuel supply to the burner when the water level falls below pre-established minimum level. Such cut-off system shall be mounted in boiler or exterior chamber with chamber provided with a full size

valved drain. For hot water boilers, the specified low water cut-off should be installed above the top of the boiler, except that it may be installed slightly below the normal water line in those instances where the upper portion of the boiler drum is used as an expansion chamber.

- 2) Safety pressurestat or safety aquastat set at 200° F or set at a point not more than 20% higher than the point setting of the operating control and so installed as to automatically stop the fuel burner when the operating control fails to function. Operating and safety pressurestats or aquastats shall not have cocks or shut-offs. For multiple boiler installations, each boiler shall have inlet and outlet valves; and where points of connections for operating pressurestats or aquastats are separated from the boiler by a line valve, each boiler shall be provided with two (2) pressurestats (steam) or aquastats (hot water).
- 3) Valved drain or drains.
- 4) Each boiler shall be provided with three (3) or more ASME Code safety valves, with any two (2) safety valves large enough to dissipate full capacity required by 1962 ASME Boiler Code or each boiler shall be provided with two (2) or more ASME Code safety valves with each safety valve large enough-to dissipate full capacity required by 1962 ASME Boiler Code. The discharge from safety or safety-relief valves shall be so arranged that there will be no danger of scalding attendants. The safety or safety-relief valve discharge shall be piped away from the boiler to a point of safe discharge and there shall be provisions made for properly draining the discharge piping.
- 5) Boilers may be steel or cast iron construction.
- 6) Each aquastat or group of aquastats shall have an adjacent water thermometer. Each pressurestat or group of pressurestats shall have an adjacent water or steam gauge.

Section 185.435 Fuel Burners, Fuel Burning Installations and Heating Installations

- a) Fuel burners, fuel burning installations, heating installations and all oil and gas storage and piping installations shall comply with all applicable provisions of Section 185.485 and the following, unless-exception thereto is specifically set forth in this Part:
  - 1) NBFU "Code for the Installation of Heat Producing Appliances-December 1955"
  - 2) NFPA 30-1961 (flammable liquids)
  - 3) NFPA 31-1961 (oil burning equipment)
  - 4) NFPA 54-1959 (gas piping, appliances)
  - 5) NFPA 58-1961 (LP-gas storage)
  - 6) NFPA 59-1958 (LP-gas utility plants)
  - 7) NFPA 60-1961 (pulverized fuel)
  - 8) NFPA 90A-1961 (air conditioning, heating)
  - 9) NFPA 90B-1961 (warm air heating)
- b) All standard and added associated controls and components shall be AGA, UL or FM approved.
- c) Fuel burning equipment located in spaces where accessible to occupants, where permitted under Section 185.390(e)(2)(B), shall be fully enclosed in a locked metal cabinet so arranged that no moving part, control, burner or device is accessible without first unlocking the cabinet, or shall be mounted at least 8 ft. above floor with all valves, adjustment and other devices so arranged that they cannot be subjected to tampering. Such equipment shall further comply with Section 185.370 (b)(4)(H), 185.380 (b) and other applicable provisions of this Part.

Section 185.440 Fuel Burners and Other Heat Sources

- a) Fuel burners and other heat sources shall be of the following types:
  - 1) Stokers
  - 2) Oil Burners
  - 3) Gas Burners
  - 4) Combination Oil and Gas Burners
  - 5) Hand Firing Grates
  - 6) Electrical Units.
  
- b) Each fuel burner (other than burners for incinerators and kilns; or packaged, factory assembled interior or exterior unitary equipment; conversion or separate burners, with gas input of 200,000 Btu/hr. or less, or oil input of 1.5 gph or less,) shall be provided with the following minimum operating and safety controls (unless otherwise noted):
  - 1) Provide relay and thermal protection or magnetic starter for each 1 phase motor; magnetic starter for each other motor; disconnect for each motor. Control wiring (and all controls) shall be 120 volt or less, shall be protected from mechanical injury, and shall have one line grounded, with all controls wired in hot line.
  - 2) A manual emergency fuel-burner switch shall be installed in each-boiler room, furnace room, kiln room and incinerator room and on exterior of cabinet of each fuel burning air handling unit located outdoors to stop all -rue] burners located therein. The emergency switch shall be located adjacent to primary entrance door, between 6 ft. and 7 ft. above the floor; shall be painted red and labeled "Emergency Fuel Burner Switch." All new devices such as starters, disconnects, relays, switches, etc. shall be grouped, where possible, within sight of the burner, and new and existing devices clearly identified as to function, position and burner.
  - 3) An operating aquastat set at 240° F or less (hot water), an operating pressurestat set at 14 psi or less (steam), or an operating air stat set at 160° F or less (warm air) of the narrow differential type for each burner or group of burners.

- 4) A safety aquastat (hot water), a safety pressurestat (steam), a safety air stat (warm air) wired in series with the operating device, shall be provided for each boiler or furnace.
- 5) For multiple boiler installations with operating aquastats (hot water) or operating pressurestats (steam) in headers, each boiler shall be provided with two (2) aquastats (hot water) or pressurestats (steam) to provide two (2) means of safety shutdown when associated boiler valve is closed.
- 6) For multiple furnace installations with operating air stat in header duct, each furnace shall be provided with two (2) air stats to provide two (2) means of safety shutdown of associated fuel burner when associated furnace outlet damper is closed.
- 7) Where a separate oil pump is used to provide oil pressure, a safety oil pressurestat shall stop all burners served by separate oil pump when oil pressure is below a safe point. All lines shall be valved at each burner and at each pump with an oil gauge at each oil pressurestat.
- 8) Where oil is heated before being burned, a safety thermostat (with adjacent oil thermometer) shall stop all burners when oil temperature is below proper point for safe, efficient burning.
- 9) When any burner is shut off- because of excessive ambient air temperature, excessive air temperature, steam pressure, hot water pressure or hot water temperature as sensed by fuel burner safety devices, flame failure or pilot failure, manual resetting shall be required. For all other types of safety shutdown, resetting shall be automatic, unless otherwise noted.
- 10) When any burner is shut down for any other cause, resetting shall be automatic.
- 11) Each hot water boiler shall have a safety pressurestat set to stop the burner if pressure rises to within 1 psi of maximum working pressure of boiler.
- 12) A non-electric, self-closing valve (such as a lever operated check valve installed in reversed position) shall be provided in the main gas or oil fuel line to all burners (in same room or enclosure) held open by a fusible link (at ceiling over one burner) and arranged to permit valve to close and to stop all burners in room or enclosure when temperature over and/or adjacent to burner rises to 212° F and to sound identified 4" dia. common alarm gong in corridor adjacent to fuel burning

room, with identified silencing switch on fuel burner panel or wall at door. This self-closing valve may be common for all burners in a room or enclosure. Where no individual burner has an input in excess of 1.5 gph for oil or 200,000 Btu/hr. for gas, the self-closing valve may be omitted. This requirement may be satisfied by (1) a normally closed spring loaded electric valve with a fusible switch at ceiling; or (2) if one of the motorized or solenoid valves on each burner is a fail-safe self-closing valve wired through a non-recycling manual reset temperature sensitive device located at ceiling over burner and to sound above specified alarm when temperature over and/or adjacent to burner rises to 2120F.

- 13) Except as otherwise noted, each gas burner, each gas pilot for each gas burner and each gas pilot or each oil burner shall have separate manual shut-off valves and separate gas pressure regulators. Main gas supply lines to each burner shall have a common low pressure safety switch after the main burner manual valve. For gas burners both main burner lines and pilot lines shall have a gas pressurestat or pressure switch arranged to stop the associated gas burner in case of high gas pressure. For oil burners, a high limit gas pressurestat shall be for gas pilot alone; otherwise same as for gas burners. A high pressure shut-off or pressurestats may be omitted when gas pressure in the street main serving building (as given in writing by local gas utility) is not too high for proper burner operation. Resetting shall be as per "10" above.
- 14) Pilots for liquid petroleum gas (LP-Gas) shall provide 100% safety shut-off.
- 15) Except as noted, each gas burner with an input of more than 200,000 Btu/hr. and each gas pilot (for gas or oil burners) with an input of more than 120,000 Btu/hr. and each oil burner with an input of more than 1.5 gph shall be supplied with main fuel through two (2) automatic valves (one of which must be self-closing or normally closed motorized or solenoid), piped in series, wired in tandem or parallel and arranged to be operated together on a recycling basis. These valves shall be normally closed; shall close on current failure; shall close when burner is shut off; shall be open when associated burner is operating and closed at all other times. A 1/4" or larger lever handle manual cock bent to room and-a 1/4" brass plug for future test gauge shall be provided between these automatic valves. For smaller fuel inputs (200,000 Btu/hr. or less of gas or 1.5 gph or less of oil for burners, 120,000 Btu/hr. or less of gas for pilots) a single automatic fuel valve may be used.

- 16) Vents from all gas regulators in all locations, etc. shall be run separately, or to a common vent, terminated outdoors, in a screened elbow turned down, 1811 above roof or 6" from wall, and 8'-0" above grade, and at least 5'-0" to either side of any window, door or air intake. Common vent shall have area equal to total area of all connected vents. For a continuous gas pilot, the gas vent may terminate in the combustion chamber or stack.
- 17) Controls and devices called for are mandatory within given fuel input limitations. Do not duplicate controls and devices called for under specific burner requirements.
- 18) Higher settings of operating and safety aquastats, thermostats, air stats and pressurestats may be used for high temperature, high pressure systems designed and installed in keeping with limitations outlined under "Methods of Heating."
- 19) When a fuel burner is stopped by any safety control, all fuel feeding devices (other than oil circulating pumps) directly associated with the burner which is malfunctioning shall be stopped.
- 20) All safety controls shall be automatically reset except as called for by applicable reference code and paragraph (b)(7) above, and as otherwise specifically noted.
- 21) Direct-fired gas or oil water heaters, furnace-burner units, boiler-burner units, space heaters, unit ventilators, unit heaters and similar room or exterior roof-top installed, packaged, unitary, factory assembled equipment (not including kilns and incinerators) with an input of 200,000 Btu/hr. or less of gas, or 1.5 gph or less of oil and conversion or separate burners with input of 200,000 Btu/hr. or less of gas or 1.5 gph or less of oil, shall have full safety devices called for above, except with a separate manual oil valve for a main oil burner, separate manual gas valve and regulator for -a main gas burner, and separate manual gas valve for a gas pilot, and one (1) or two (2) main automatic fuel safety and control valves, as required for AGA approval and/or UL listings
- 22) Incinerators and kilns with input of 400,000 Btu/hr. or less of gas and 3.0 gph or less of oil shall also conform to paragraph (21) above with adjustable timers; post-purge and pre-purge are not required.

- 23) The following requirements of Section 185.440 (i)(2) apply to gas or oil-fired incinerators and kilns with fuel burner inputs in excess of 3 gph of oil or over 400,000 Btu/hr. of gas: (a) controls, disconnect and starter or thermal protection and relay; (b) emergency switch, gas pressurestats; (d) safety air stat; (g) oil pumps, valving; (h) oil heating: type of controls and resetting cited in numbers (9) and (10) above; (n) non-electric valve; (o) regulators, valves; (p) LPG pilots; (q) automatic gas valves; (r) vents; (s) controls; (t) settings; (u) shut-off of associated equipment; (v) resetting adjustable timers are required. Post-purge and pre-purge are not required.
- c) Each fuel burner shall be provided with the primary controls for safe start and stop, modulating, or step operation thereof in compliance with a] 1 referenced NFPA, codes, al I previous outlined requirements and the applicable provisions of Chapter 42, ASHRAE Guide-1963, and with the following:
- 1) Stokers-Hold fire controls of recycling type.  
  
Operating devices and-safety devices as called for above.
  - 2) Oil burners (vaporizing or pot type) (not to exceed 4 gph capacity) (No. 2 and lighter oil)-controls designed and installed so as to:
    - A) Meter the correct amount of oil into burner to maintain pilot flame.
    - B) Regulate the required amount of oil into the burner for its high flame operation.
    - C) Shut off completely the flow of oil in event of a flame failure with manual reset or low water level or high pressure or high temperature with automatic reset.
    - D) Provide one (1) or two (2) automatic oil valves and non-electric fuel valve or equivalent as previously described. (See Section 185.440 (i)(2)(N) and (Q).
    - E) Start, modulate, or step control and stop burners as required by all operating and safety controls described above.
  - 3) Oil burners (pressure-atomizing type and vertical rotary type) (not to exceed. 7 1/2 gph capacity) (for No. 4 and lighter oil)-controls designed and installed so as to:

- A) Energize the burner motor and electric ignition circuits;
  - B) Test for establishment of main burner flame;
  - C) Stop the burner and ignition if flame has not been -established within a pre-set time of 90 seconds or less (such as provided by a stack switch);
  - D) Monitor the flame continuously during burner operations;
  - E) Stop the burner in event of flame failure;
  - F) Provide one (1) or two (2) automatic oil valves and non-electric fuel valve or equivalent as previously described; (See Section 185.440 (i)(2)(N) and (Q))
  - G) Start, modulate, or step control and stop burners as required by all operating and safety controls described above.
- 4) Oil burners (pressure atomizing type) (over 7 1/2 gph capacity) (for No. 4 and lighter oils) controls designed and installed so as to:
- A) Achieve same control function as required in the preceding paragraph (c)(3) for oil burners of the same type except that response to flame failure shall be 15 seconds or less for burners of 33 gph capacity or less, and 4 seconds or less for larger burners.
  - B) Provide 30 seconds or more pre-ignition purge, and 15 seconds or more post-ignition purge; timed ignition; safety oil cut-off valves; low fire start.
  - C) Provide two (2) automatic oil valves and non-electric fuel valve or equivalent as previously described.
  - D) Start, modulate, step control and stop burner as required by all operating and safety controls described above.
- 5) Oil burners (horizontal rotary type or steam, air or mechanical atomizing type) (for No. 6 and lighter oils)-controls designed and installed so as to:
- A) Achieve similar functions as called for with pressure atomizing type in paragraph (c)(3) above.
  - B) Provide a pre-ignition purge period of 30 seconds or more before energizing the gas pilot;

- C) Prove the presence of proper ignition conditions before permitting the flow of oil to the burner;
  - D) Prove proper air flow with UL approved air flow switch and prove the existence of a stable burner flame within the preset, timed ignition trial period;
  - E) Monitor the main burner flame during its entire period of operation;
  - F) Shut off the main fuel supply within four seconds after flame failure;
  - G) Shut off the flow of oil when so required by actuation of the operating or safety controls, but providing for the continuation of burner operation for a pre-set purging period of 15 seconds following the closing of the main fuel valve-
  - H) Lock out in the event of flame or pilot failure;
  - I) Provide two (2) automatic oil valves and non-electrical fuel valve or equivalent as previously described;
  - J) Start, modulate, or step control and stop burner as required by all operating and safety controls described above.
- 6) Gas burners (400,000 Btu/hr. input and smaller) controls designed and installed so as to:
- A) Prevent opening of the automatic gas valves until the pilot is operating properly;
  - B) Stop completely the flow of gas through the burner whenever safe ignition conditions do not prevail (manual reset);
  - C) Maintain a continuously burning gas pilot monitored by a thermocouple;
  - D) Provide one (1) or two (2) automatic gas valves for inputs of 200,000 Btu/hr. or less and two (2) automatic gas valves for larger inputs, and non-electric fuel valve or equivalent as previously described. (See Section 185.440 (i)(2)(N) and (Q).

- E) Start, modulate, or step control and stop the burner as required by all operating and safety controls described above.
- 7) Gas burners (atmospheric type) (over 400,000 Btu/hr. input)-controls designed and installed so as to:
- A) Provide a continually burning gas pilot;
  - B) Provide flame safeguards which will function in the following, sequence: Upon receiving a "call for heat" prove existence of a proper pilot before permitting opening of the main fuel valves; cause complete safety shutdown if adequate pilot has not been proved; and upon flame failure during burning cycle, close the main gas valves;
  - C) Provide two (2) automatic gas valves and non-electric fuel valve or equivalent as previously described;
  - D) Start, modulate, or step control and stop the burner as required by all operating and safety controls described above.
- 8) Gas burners (power or forced draft type) (over 400,000 Btu/hr. input)-controls designed and installed so as to:
- A) Provide for a pre-ignition purge of 30 seconds or more where applicable;
  - B) Establish and prove the existence of the pilot within 15 seconds or automatically cause a safety shut-down;
  - C) Open the automatic gas valves upon proof of the existence of a proper pilot;
  - D) Close gas valves within four seconds following a flame failure occurrence;
  - E) Maintain a post-purge burner running period of 15 seconds or more following gas valve closing at end of burner operating cycle where applicable;
  - F) Cause safety shutdown in event of pilot or flame failure. Re-establish safe pilot (including constant pilot) within 15 seconds or shutdown the burner;
  - G) Provide two (2) automatic gas valves and non-electric fuel valves or equivalent as previously described;

- H) Start, modulate, or step control and stop the burner as required by all operating and safety controls described above;
  - I) If a power burner is equipped with an electrically ignited constant pilot, pre-purging or post-purging will not be required.
- 9) Combination oil-gas burners shall have primary controls as required for both fuels.
- d) Every fuel line serving as a supply to a fuel burner or pilot shall be provided with a manual shut-off valve. Where fuel gas is provided by a local utility, each gas fuel burner installation shall be approved by the local gas utility for connections to their gas mains.
- e) Burners for No. 6 oil shall have oil heaters and oil pumps, separate or integral.

Section 185.445 Flue Pipes, Vent Pipes, Smoke Pipes and Draft Controls

- a) Each oil, gas or coal fired boiler, furnace, space heater or other fuel burning device (other than incinerators) shall have a flue pipe, vent pipe, smoke pipe, or breaching in compliance with NBFU "Code for the Installation of Heat Producing Appliances-December 1955" or with NFPA 90A-1961 and 90B-1961.
- b) Barometric draft adjusters with area not less than 100% of the required breaching area shall be provided for all stoker and oil burner installation and for those gas burner installations where such is required by the local gas utility. Barometric draft adjusters as required or recommended for gas burner installations by the local gas utility shall be of the double acting type.
- c) AGA approved draft diverters without moving parts shall be provided for all other gas burner installations.
- d) The provisions of Section 185.445 (b) and 185.445 (c) shall not apply to those installations having forced draft or induced draft fans.

Section 185.450 Combustion Air Supply

- a) Each room or space housing a fuel burning device of any kind shall be provided with a supply of air (make-up air) adequate for combustion purposes and to eliminate the possibility of negative pressure conditions. Such supply shall comply with the provisions of this Section.
- b) The outdoor air supply, as required herein, shall be direct from the exterior into the room or space housing the fuel burning equipment.

EXCEPTION: This exception shall apply only to combustion air supplied for that fuel burning equipment included within the scope of the Exceptions allowable under Section 185.390 (e)(2)(8) and (C). The combustion air supply for such equipment may be obtained through wall openings from an adjacent large room or space, which possesses movable windows or other approved openings to the exterior of sufficient size to provide adequate combustion air. Wall openings into small rooms shall conform to:

- 1) Have not less than 1 sq. in. of net free open area (excluding area taken up by louvers, grilles, etc.) for each 1,000 Btuh of fuel input in each of two separate grilles or louvers.
  - 2) One grille or louver shall be located with bottom not more than 8" above the floor and the second grille or louver of equivalent size shall be located not less than 4 ft. above the floor.
  - 3) Otherwise comply with the requirements of this Section.
- c) All combustion air openings shall be permanently open or shall be so arranged as to automatically open when (or before) the fuel burning equipment is started, except that these requirements shall not be mandatory for those openings located in large rooms or spaces which directly or indirectly (as permitted under the Exception to Section 185.450(b)) provide combustion air to fuel burning equipment falling within the scope of the Exception to Section 185.390 (f)(2)(B), provided that the cubic capacity and arrangement of such rooms or spaces is such that an ample supply of combustion air for such equipment is assured and provided further that there is no evidence of any negative pressure condition.
  - d) Unless otherwise specified, the net free area of required outdoor combustion air openings (excluding that area taken up by louvers, grilles or frames) shall be either not less than 1 1/2 times the required stack area or not less than 1 sq. in. for each 14,000 BTUH fuel input to the fuel burner, whichever is the larger.

- 
- e) Where there is evidence of a negative pressure when the fuel burning equipment is operating (as indicated by a rush of air into the space when an outdoor window or door is opened on a calm day) additional outdoor combustion air openings or a positive make-up outdoor air supply system shall be provided for the room or space until no such negative pressure exists.
  
  - f) Where it is impractical to provide sufficient outdoor combustion air opening, an automatically controlled combustion air fan with automatic damper may be used to supply combustion air. Where necessary to overcome a negative pressure in the room or space, an approved induced or forced draft fan shall be provided on each fuel burning device or group of devices and shall be sized and operated to assure freedom from downdrafts or back drafts. Such draft fans (and combustion air fans) shall be automatically started before start of the fuel burning device.

Section 185.455 Type of Ventilating Systems

- a) Outdoor air supply ventilating systems, where required for Assembly, Educational and Special Educational Occupancies shall be designed to introduce outdoor air (without drafts) in minimum quantities specified, and shall be the following types:
  - 1) Window type, with windows opened manually by occupants with or without exhaust fans and provided with draft-preventing window deflectors where necessary.
  - 2) Local unit ventilator type with steam or hot water coils, electrical heating elements, or direct fired burner.
  - 3) Local direct fired or electric furnace type.
  - 4) Central fan systems, with steam or hot water coils, electrical heating elements, or direct fired burners.
  - 5) Local unit heater systems, with steam or hot water coils, electrical heating elements or direct fired burners, with outdoor air connection.
- b) Outdoor air intakes shall not be located where they may be contaminated by smoke, products of combustion, odors, exhaust fumes, gas or oil fumes, or other toxic vapors; and shall be at least 5'0" from the outlet of any plumbing vent.
- c) Exhaust air ventilating systems where required for Assembly, Educational, and Special Educational Occupancies, shall be of the following types:
  - 1) Wall type, or in-room type, exhaust fans, discharging to outdoors, either directly or indirectly through duct system, with self-closing or automatic motor operated discharge dampers which close automatically when fan is not operating.
  - 2) Roof exhaust fan type with or without duct system, with self-closing or automatic motor operated discharge dampers which close automatically when fan is not operating.
  - 3) Central exhaust fan type, with inlet and discharge ducts, with self-closing or automatic motor operated discharge dampers which close automatically when fan is not operating.
- d) Exhaust fans shall discharge to locations where the exhaust air will not contact human beings; where it will not re-enter the building through windows or outdoor air intakes for ventilating equipment; and where it will not blow on any required means of exit.

Section 185.457 Outdoor Air Required

- a) Every Assembly, Educational and Special Educational Occupancy room or space (not including toilet, shower or locker rooms, corridors, stairs, etc.) having a capacity of more than 10 persons shall be provided with outdoor air at a minimum rate of 5 cfm per occupant whenever the room or space is occupied.
- b) The above requirement shall be considered to be met where one of the following conditions exist:
  - 1) The room or space has movable or operable exterior doors and/or windows with total area of wall opening not less than 1 sq. ft.-per occupant or 3% of the net floor area.
  - 2) The room or space has movable exterior windows with not less than 1/2 sq. ft. per occupant or 1 1/2% of the net floor area plus an exhaust fan system capable of exhausting 5 cfm per occupant whenever the room or space is occupied with windows open.
  - 3) All windows included in the movable window area calculations as provided above shall be equipped with deflectors arranged to avoid drafts on the room occupants.
  - 4) The occupancy of any room or space (for determining air circulation and/or outdoor air requirements) shall be (a) actual occupancy; or (b) 60% of exit occupancy calculated from table in Section 185.310(f)(4), whichever is the largest.
- c) In cases not included under (b) preceding, the requirements of (a) above shall be met by fan air supply systems-(unit ventilators, unit heaters, central and furnace systems, etc.) which introduce the required volume of outdoor air to each room or space without drafts.

Section 185.460 Exhaust Systems Required

- a) Certain rooms and spaces shall be provided with fan systems to exhaust air from each area as follows:
  - 1) Shower rooms, toilet rooms-1 1/2 cfm per sq. ft. of floor area.
  - 2) Kitchens for cafeterias, dining rooms, lunchrooms, etc.-2 cfm per sq. ft. of total ceiling area drawn from over cooking surface. Where a ceiling hood is used, it shall overlap cooking area or fume producing area by 6" or more on all sides. Total exhaust from a hood shall be based on total ceiling area (2 cfm per sq. ft.) or on 100 cfm per sq. ft. of hood area, or 150 cfm per lineal foot of exposed hood perimeter, whichever is the largest.
  - 3) Welding rooms-Hood over welders, with air at 75 fpm or higher velocity entering the hood face.-Or, the booth around the welder with air at 100 fpm or higher velocity entering the booth opening.-Or 600 cfm per welder drawn from slightly above the work location.
  - 4) Paint spray booths or spaces-Booths around work with air at 150 fpm or higher velocity entering booth opening.-Or, 800 cfm per spray painter drawn from slightly above work location.
  - 5) Laboratory Fume Hoods-Normal working opening, with air exhausted at not less than 150 fpm per foot of length of hood opening.
  - 6) Laboratories in which objectionable fumes are produced and kiln room-1 1/2 cfm per sq. ft. of floor area in addition to fume hood exhaust. Where a ceiling hood is used, it shall comply with Section 185.460 (a)(2).
  - 7) Swimming pools-2.0 cfm per sq. ft. of ceiling area.
- b) Industrial type equipment (as distinguished from portable equipment) such as buffers, polishers, kilns, grinders, automobile., tractor and other internal combustion engines; wood planers, saws, jointers, etc., located in Assembly, Educational and Special Educational Occupancies, room or space, shall have local exhaust connections as required to prevent objectionable lint, dust, sparks, shavings, sawdust, odors, fumes, etc. from entering the room in which they are located.
- c) A separate exhaust system shall be provided for each type of objectionable, flammable, or greasy air exhausted. Exhaust air from various types of rooms (except from paint spray rooms, laboratory hoods, kitchen hoods) may be combined into one or more

---

exhaust systems, providing each exhaust opening (drawing from each room) is equipped with a self-operating damper which will prevent backflow of air from the exhaust system into the various rooms when the exhaust fan is not operating.

- d) Exhaust systems included in Sections 185.460 (a)(2)(4), 185.460 (b) and 185.460 (c) and others handling fire supporting or explosive fumes, spray or dust must have spark-proof fans with motors, controls, belts and wiring outside of airstream, and ducts shall be arranged for ease of cleaning.
- e) Exhaust systems included in Section 185.460 (a)(1)(7) and others handling damp air or water spray must be of rustproof construction with controls, belts, motors and wiring outside of air stream.

Section 185.465 Ducts, Fire Dampers and Filters

- a) Ducts and fire dampers shall conform to requirements of NFPA 90A-1961 and NFPA 90B-1961. Fire dampers and fire doors shall be provided as called for elsewhere in this Part.
- b) Ducts shall be of noncombustible construction.
- c) Duct lining shall be noncombustible and shall have a surface flame spread rating of not more than 25.

SUBTITLE A

SUBCHAPTER d

Section 185.470 Operation of Ventilating Systems

- a) Air supply systems shall employ gradual, smooth control, designed and operated so as to avoid rapid or steep fluctuations in air outlet temperature and objectionable drafts on occupants. The temperature of air discharged into any space shall be not less than 60° F, except that where special equipment is employed for draftless diffusion of the air supplied, or where the physical character and occupancy of the space is such that low temperature air will not create objectionable drafts, then air may be supplied 20° F below room temperature.
- b) Exhaust systems shall be operated whenever the room(s) or space(s) served thereby is (are) occupied.

Section 185.475 Stopping of Ventilating Equipment

Where a fire alarm system is installed to comply with other Sections of this Part, the following mechanical ventilating systems shall be arranged to be automatically stopped upon actuation of the building fire alarm system and to require manual restarting:

- a) Any system which employs partial, variable, or full recirculation serving rooms or spaces with a combined capacity of 200 or more. This requirement does not apply to classrooms with direct exterior exiting nor to systems arranged for automatic 100% mechanical exhaust.
- b) Any system which returns or exhausts through stairwells, corridors, or other means of egress.

Section 185.480 Incinerators

See Section 185.440 (b)(22) and (23). Incinerators and their installations shall also conform to applicable requirements of IIA-63 or NFPA 82-1960, except as follows:

- a) The net opening for combustion air supply shall be not less than 150% (300% for draft inducing fans which employ room air to induce draft) of the area of the natural draft stack recommended by the incinerator manufacturers and shall conform to all requirements specified for similar openings for boilers.
- b) Incinerators and refuse accumulation areas shall be located in boiler rooms, furnace rooms, or in other rooms meeting all construction and separation requirements for Boiler Rooms, as established in Section 185.390 (e)(2) exclusive of the "Exceptions" allowable therein.
- c) Incinerators shall have barometric draft adjusters.
- d) Breeching and stack for natural draft, and breaching on the hot gas inlet side of draft inducing fans, shall be built for 1700° F gases and shall be equivalent to bare cast iron, or 12 gauge or heavier steel, lined with 2 in. of first grade fire brick or plastic fire brick, all spaced from construction in keeping with NFPA No. 90A and 89M-66 and not insulated. Where effective means are provided to limit hot gas temperatures to 800° F (such as discharge of a draft inducing fan), normal breaching and stack construction are acceptable.
- e) Other stacks and breechings serving boilers and/or furnaces, where the area of stack and breaching is 300% or more of incinerator area requirements may be constructed the same as for boilers, and used for boilers or furnaces plus incinerators.

Section 185.485 Gas Piping

- a) The term "gas piping," as used herein, shall refer to all piping installed to supply, distribute or otherwise handle or store manufactured, natural or liquefied petroleum gas.
- b) All gas piping shall comply with the applicable requirements of NFPA 54-1959 and NFPA 58-1961, except as otherwise specified under Section 185.390 (e)(1) and Section 185.485 (c) through 185.485 (f), and as follows:
  - 1) The minimum pipe sizes and the drips, as required therein, shall be considered as being recommended but not mandatory, and
  - 2) Iron pipe-sized brass, steel, and wrought iron pipe with threaded or welded joints and copper or brass pipe with sweated joints may be used.
- c) No gas piping shall be located in crawl spaces, attic spaces, pipe spaces or under floor spaces or in tunnels unless such are adequately ventilated to the outside.
- d) No gas piping which has been deactivated or is no longer in use shall remain connected to inservice piping even though such is separated therefrom by a closed valve. Such piping where deactivated or taken out of service shall be purged in an approved manner and shall be disconnected from any inservice gas piping.
- e) See Section 185.390 (e)(1)(B) for liquefied petroleum gas piping requirements.
- f) The installation of new liquefied petroleum-gas piping shall be restricted as provided for under Section 185.390 (e)(1) and shall not be permitted to be concealed in any inadequately ventilated wall spaces, attics, or other similarly enclosed spaces.
- g) Every building's main gas supply line shall be provided with a conspicuously marked or located, identified, readily accessible, tight closing shut-off valve located on the outside of the building. Markings of locations must be permanent, steel or concrete posts or non-ferrous or stainless steel metal plaques on adjacent walls which are conspicuous, visible and readable with snow 3'-0" deep. Marker posts must be painted red and must not interfere with use of ground area for its intended use. Valve or valve box must be painted red and tamperproof with three (3) keys or operators delivered to the school board and one (1) key or operator, permanently labeled as to the school, delivered to the local fire station.

Section 185.488 Kilns

- a) Gas or oil fired kilns shall, in general, comply with all requirements for incinerators (see Section 185.480 with manual fuel control valves, plus automatic valve or valves controlled by an operating furnace stat (if used), and safety furnace stat.
- b) Where the kiln has a direct flue connection through roof, breaching and flue shall be built the same as for incinerators with a draft inducing fan. Total room exhaust including inducing fan, shall be not less than 2 cfm per sq. ft. of ceiling area. Where air supply to the room prevents negative pressure due to room exhaust and natural draft will suffice for the kiln, the draft inducing fan in the kiln flue may be omitted. Where the kiln does not have a direct flue connection, it shall be provided with an exhaust ceiling hood, overlapping the kiln by 611 or more on all sides, and the exhaust system arranged so that no "spill" occurs between perimeter of hood and top of kiln. Provide adequate, permanently open, or automatically opened combustion air opening into the room or space from outdoors, adjacent rooms or corridors; space the kiln from construction the same as for incinerators. The kiln must comply with NFPA-86A- 1966.

Section 185.490 Steam Pressure Reducing Valves

Pressure reducing valves shall be provided to reduce steam pressure in one or more stages, as required for installation. At outlet of final stage of pressure reduction, safety or relief valves (same as for steam boilers) shall be provided and sized to prevent build-up of pressure on low side in excess of safe working pressure at weakest part in case of malfunctioning of any pressure reducing valve or because of human error. Pressure reducing valves shall have steam gauges before and after each stage; valve before (globe valve) and valve (gate valve) after each stage; a proper size by-pass with angle or globe valve for each stage; a 3/4" pop safety valve to serve as signal of high pressure at the outlet of the final stage. Provide readable steam gauges with cock at inlet and outlet of each stage of pressure reduction. Pressure reducing valves must be inaccessible to building occupants but must be readily accessible for servicing by maintenance personnel.

Section 185.495 High Pressure Boilers and Safety Controls

- a) Any steam boiler designed to operate at more than 15 psi or any hot water boiler designed to operate at more than 250° F or more than 160 psi is considered to be a high pressure boiler and must conform to ASME Boiler and Pressure Vessel Code, Section I, Power, 1965, for pressure used, with welds X-rayed and stress relieved in furnace at 1200° F.
- b) High pressure boilers shall comply with all requirements specified for low pressure boilers, except varied to conform to the higher temperatures and pressures used, including, but not limited to Section 185.430 (b) to Section 185.450 (f) inclusive, except that when coal is used as fuel, or the furnace has a large amount of heated refractory, safety shut-down devices shall be so arranged as to avoid overheating of the furnace, grates, etc. by quick shut-down, and safety valves must discharge to outdoors.
- c) High pressure boilers shall have ASME tandem blow-off valves, extra heavy or Schedule 80 blow-off piping and ASME blow-off tank or equivalent device with vent through roof and drain to floor drain or outdoors.

Section 185.497 Roof Top or Roof Mounted Heating, Cooling, Heating-Cooling Air Supply Units

- a) Roof-top or roof-mounted units shall comply with all applicable NFPA, UL and AGA requirements, all requirements of this Subpart and applicable requirements for indoor units of the same type and fuel input, including, but not limited to, controls, multiple valves, fire detectors, pilot lights, alarm gongs, silencing switches, tamper and vandal-proof emergency door switches (located outside of the main access door), non-electric valve or equivalent to close with high temperature over the burner and the following: (a) each unit shall be started and stopped by an identifying pilot light (white) at central indoor control point in administrative office; (b) the actuation of any safety control called for in Section 185.440(b)(9) and (11) shall sound a 411 dia. common alarm (with silencing switch) and shall light an individual identified pilot light (red) for each remote unit, located adjacent to alarm gong.
- b) The cabinet, penthouse or housing shall be of weather-tight, tamper- and vandal-proof construction; shall have an interior light and convenience outlet, and fire detector connected to the building fire alarm system; shall be so arranged (or rearranged; that all devices may be serviced; shall be securely anchored to the roof opening, and grounded. The main oil or gas valve must be vandal and tamper-proof, painted red and shall be 5'0" or more outside of cabinet where accessible.
- c) Units employing steam or water as a heating or cooling medium shall comply with the above requirements except for fuel burners, and shall be arranged to avoid freezing.

SUBPART E: ELECTRICAL SYSTEMS

Section 185.500 Scope

Subpart E establishes the minimum requirements necessary to protect the health and safety of pupils against the inadequate and unsafe installation of lighting, fire alarm, fire detection, exit identification, emergency lighting and other electrical systems.

Section 185.510 General Requirements

- a) All electrical equipment and installations shall comply with all applicable requirements of the National Electric Code, (NFPA 70-1959) unless specific exception thereto is set forth in this Part, except that-
  - 1) Reference to buildings other than school buildings, school office buildings, and school bus garages shall be disregarded.
  - 2) Each Assembly, Educational and Special Educational Occupancy classroom shall have not less than two receptacles or convenience outlets.
  - 3) Illumination levels shall be as specified under Section 185.595 (a).
  - 4) Electrical fixtures and frames for such fixtures in or adjacent to pools, in pool rooms, janitors' closets, showers, toilets and bath rooms, and other rooms which may be wet shall be solidly and permanently grounded to the neutral wire or to a separate ground wire.
  
- b) Fire alarm and fire detection systems and their installations shall comply with the requirements of NFPA 72-1961 and 72C-1961, applicable to an electrically operated, supervised, non-coded system with devices labeled for designated use by UL or FM where such labeling is available.

Section 185.520 Branch Circuits

- a) The total load shall not exceed the branch circuit rating nor shall it exceed 80% of the branch circuit rating where, in normal operation, such load will continue for long periods.
- b) The rating or setting of overcurrent devices shall not be in excess of the carrying capacity of the circuit conductor.

Section 18S.530 Feeders

- a) Feeders shall be of adequate size to serve the total connected load at a demand factor of 80% for lighting and 100% for heating.
- b) The entire lighting load shall be considered as being "connected." The connected receptacle load shall be computed on the basis of the equipment thereby served but in no case less than 1 1/2 amp. per outlet.

Section 185.540 Overcurrent Protection

- a) No overcurrent devices shall be permitted in any permanently grounded conductor.
- b) Conductors shall be protected in accordance with their current-carrying capacity, except as otherwise permitted by the National Electric Code (NFPA 70-1959).
- c) Fuse holders for plug fuses shall be provided with an adapter to limit the size of the fuse that can be used therein. The capacity of such adapter and fuse size shall not be greater than the current-carrying capacity of the conductor served.

Section 185.550 Wiring Methods

- a) Wiring methods or systems, including alarm, exit, and emergency wiring systems, above 24 volt potential, shall be any of the following or a combination thereof:
  - 1) Rigid metal conduit.
  - 2) Electrical metallic tubing.
  - 3) Flexible metal conduit.
  - 4) Surface metal raceway.
  - 5) Metal multi-outlet assembly.
  - 6) Under floor raceway.
  - 7) Cellular model floor raceway.
  - 8) Cellular concrete floor raceway.
  - 9) Wireways, enclosed, ventilated.
  - 10) Busways, enclosed, ventilated.
  - 11) Concealed or inaccessible knob and tube.
  - 12) Armored and non-metallic sheathed cable.
- b) Existing installations of armored and non-metallic sheathed cable and of exposed or otherwise readily accessible knob and tube wiring shall be permitted for continued use provided such installations have been properly maintained; do not contain overload conditions; and otherwise are found to be safe and in compliance with accepted practices governing such installations. Minor alterations shall be permitted to such existing installations, provided such alterations do not increase the connected load and are carried out in compliance with the National Electric Code (NFPA 70-1959). Such installations shall not be extended.
- c) All panels, switches, starters, breakers, contactors, etc., accessible to pupils shall be of the dead front type.

Section 185.560 Exit Lighting

- a) Exit and directional exit signs shall be provided where called for under Section 185.370 (a)(b).
- b) All exit signs shall have letters not less than 4 in. high with 3/8 in. or wider stroke with a contrasting background and shall be internally illuminated by at least 25 watts of incandescent lighting or fluorescent lighting of equal lumen output. Other equivalent means of illumination may be used. Directional arrows, where required, shall be of size, color and design compatible with the letters of the signs involved.
- c) If a central emergency lighting system is available, such system shall be used as a supply for all required exit signs.
- d) Where a supply is from the normal building service, a supply connection thereto shall be as close to the primary service source as is practical and shall not be more remote from such source than a connection at the main distribution equipment.

Section 185.570 Emergency Lighting

- a) Emergency lighting system shall be provided where called for in Section 185.370 (a)(6).
- b) Wiring for emergency lighting shall not be combined with general lighting circuits or with power supply wiring. Exit lights and emergency lighting wiring may be run in the same conduits.
- c) Emergency lighting systems shall be supplied by a normal power source(s) of approved voltage, in combination with an approved auxiliary power source(s). A complete separate, central or unitary wiring system shall be provided for each emergency lighting system.
- d) Normal source(s) of power supply shall be considered as that which supplies current for general lighting purposes.
- e) An approved, automatic, self-restoring transfer switch or switches shall be provided for each emergency lighting system which shall automatically and instantly disconnect the system from its normal source of power supply and connect it to the auxiliary supply source, upon the failure of the normal current supply.
- f) The auxiliary supply source shall provide a safe and dependable standby power source in the event of the failure of the normal supply service and shall be considered as meeting the requirements of the specification when in compliance with one of the following:
  - 1) Where the normal lighting and power is from an isolated local or private plant, the auxiliary source may be taken from an approved overhead or underground separate service which is supplied from a separate source, (i.e. public utility).
  - 2) Where the normal lighting-and power supply is alternating current from separate transformers (one transformer for lighting and one for power), the auxiliary supply service may be from the power service supply transformers). Current supply to the transfer switch(es) may be taken-from the first distribution center on the load side of the power service switches.
  - 3) Where light and power services are supplied by a common source consisting of an underground three phase network system, which in turn is fed from more than one generating station or distribution sub-station, the requirement for an auxiliary supply shall be considered as having been complied with if the normal supply service is taken from the line side of the main service switch. No transfer switch will be required.

- 4) Where the source of current is common to both light and power and is of the "spot network" type (two separate primaries, two utility company transformers and all switch gear necessary to accomplish automatic switching), the normal supply service may be tapped on the line side of the main building service switch. No auxiliary supply or transfer switch will be required.
  - 5) Central, automatically charged battery(s), or local packaged emergency lighting units with individual batteries and individual automatic charges shall be acceptable as auxiliary power sources.
  - 6) A generator driven by some form of prime mover, using liquid or gaseous fuel, which has sufficient capacity and proper rating to supply emergency lighting circuits plus such other power as is desired and which is equipped with suitable means for starting the prime mover automatically upon failure of the normal source of current supply shall be acceptable as an auxiliary power source. Installation shall comply with NFPA 37 "Installation and use of Internal Combustion Engines and Gas Turbines."
  - 7) Where the source of current consists of a single utility company primary supplying one or more transformers located as an outside "Pole Vault," on a pad outside of the building, or located in vault inside the building, a tap on the line side of the main service switch shall serve as the emergency supply. No transfer switch will be required. However, the emergency lights shall be continuous burning or provided with an automatic device that shall energize such emergency circuits in the event of failure of the normal source.
- g) The installation of a separate transformer for the purpose of obtaining proper voltage for emergency lighting systems shall not be required where the utility service company's power supply has a mid-point ground on one phase with a resultant 115 voltage from phase to mid-point ground.

Section 185.580 Fire Alarm Systems

- a) Fire alarm systems complying with the provisions of this Section and Section 185.500 (a)(2) shall be provided where required under Section 185.395 (d).
- b) Fire alarm systems and equipment shall be of standard electrically operated, supervised, continuous, or cadence non-coded type complete with main panel and audible trouble indicator installed in full compliance with the provisions of Section 185.500 (a)(2). Equipment shall be listed as approved for intended service by UL or FM. Current for the fire alarm system shall be supplied from line side of main switch, from emergency lighting system or from automatically charged batteries.
- c) Fire alarm systems shall be interconnected with required sprinkler systems, fire detection systems and other equipment of a hazardous nature, as required under Section 185.395(b)(4)(C), 185.395(b)(4)(G), 185-395(b)(4)(H), 185.395(c)(3), 185.475(a) and 185.590.
- d) Every fire alarm system shall be under the supervision of a responsible person who shall conduct operating tests of each such system at least once every week. Such tests shall not be required during summer vacation periods if the building involved is closed and not subject to use by pupils or the public.
- e) All alarm sending stations in a single system shall be of the same general type and shall be painted red.
- f) The system arrangement shall be such that there is no difference in sound between an actual alarm and a fire drill alarm.
- g) Sounding devices shall be alarm horns and shall be used for fire alarm purposes only. Horns shall be of vibrating type with decibel rating of not less than 90 at 10 feet. Bells, chimes, etc., shall not-be permitted.
- h) Systems shall be so arranged that no manual intervention is required following system actuation in order to cause the operation of all alarm horns. No facilities or arrangement shall be permitted whereby such alarm horn operation can be controlled or modified.
- i) Interconnections or cross connections between a fire alarm system and other safety systems, devices and equipment, as referenced under Section 185.580(c), shall be so carried out and maintained as to accomplish their Intended functions without impairing the reliability and effectiveness of the alarm system as a whole.

Section 185.590 Fire Detection Systems

- a) Automatic fire detection systems shall be provided where required under this Part and shall comply with the requirements of this Section and NFPA 72-1961 and 72C-1961.
- b) Automatic fire detecting devices shall be listed by UL or FM and shall be electric rate-of-rise or fixed temperature thermostats of the spot detection type, or smoke or ionization detectors of the radio-active or electric-eye type. Existing continuous temperature sensitive wire or pneumatic tube fire detection systems shall be permitted to be continued in use provided such have been installed and maintained in compliance with the accepted standards applicable to such systems. Minor alterations and extensions to such continuous wire or tube systems shall be permitted subject to the approval of the Enforcing Authority.
- c) Every fire detection system shall be so installed as to be an integral part of the building fire alarm system in compliance with the requirements of NFPA 72-1961 and 72C-1961. Any detection actuation shall automatically sound building alarm horns. Any trouble in the detection system shall audibly be indicated on the main alarm system panel.

Section 185.595 Minimum Levels of Illumination

The following minimum average levels of illumination shall be maintained:

- |    |   |                 |
|----|---|-----------------|
| a) | Educational-and Special Educational classrooms, study hall, library reading areas, offices, etc. unless otherwise specified below | 12 foot candles |
| b) | Gymnasiums, cafeterias and multi-purpose rooms  | 8 foot candles  |
| c) | Interior stairs and ramps   | 5 foot candles  |
| d) | Auditoriums, toilets, dressing rooms, interior corridors, and other interior paths of ingress-egress and exit travel              | 3 foot candles  |
| e) | Exterior exit stairs  | 2 foot candles  |
| f) | Fire escapes, exterior balconies, exterior walkways, etc. used for exit purposes  | 1/4 foot candle |

SUBPART F: WATER SUPPLY

Section 185.600 Scope

- a) Subpart F establishes the minimum requirements necessary to protect the health and safety of pupils against the improper and unsafe installation of water supply and distribution systems.
- b) Water supplies for sprinkler system installation shall comply with the applicable provisions of this Subpart which establish the requirements for the connection of such supplies to potable water systems including an open air gap connection between such potable water supply and tank.

Section 185.610 General Requirements

- a) All water in schools, subject to human consumption or use, shall be supplied from an approved public water supply and distribution system wherever such a system is available, in compliance with the applicable-provisions of Chapter 10 of the Illinois State Plumbing Code, dated July 1, 1959.
  
- b) Where an approved water supply and distribution system is not available as a supply source, all water subject to human consumption and use shall be supplied by a system which complies with all applicable requirements of the Illinois State Plumbing Code, the Illinois Water Well Construction Code, the Illinois Water Well Pump Installation Code and, in addition, with all applicable recommendations and requirements of Circular No. 829-July 1960, published by the Department of Public Health, State of Illinois and of the Committee Report of the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers dated January 1951 and titled "Policy for the Review and Approval of Plans and Specifications for Public Water Supplies,"- including all tentative revisions through 1960, subject to the following interpretations, deviations or exception:

The required treatment of water shall be limited to that necessary to produce the quality of water specified under Section 185.620.

Section 185.620 Quality of Water Supply

- a) All water supplied to a school or to a fixture therein shall have a bacteriological quality, as determined by the coliform group, of not more than 1 per 100 ml during any one month. Such quality shall be determined in accordance with the applicable provisions of Circular #829-1960 of the Department of Public Health, State of Illinois.
- b) The chemical quality of all water provided to a school or to the fixtures installed therein shall not exceed the following limiting figures:
  - 1) Chloride (CL)-250 ppm
  - 2) Fluoride (F)-1.5 ppm
  - 3) Sulfate (SO)-250 ppm
  - 4) Nitrate nitrogen (N)-20 ppm
  - 5) Total solids-500 ppm-
  - 6) Turbidity-10 ppm (silica scale)
  - 7) Color-20 (Standard Cobalt Scale)
- c) No objectionable taste or odors shall be permitted.
- d) All water quality testing shall be carried out in compliance with the recommendations set forth in "Public Health Reports, Reprint No. 2440-1946," published by the U.S. Public Health Service.

Section 185.630 Water Delivery Pressures and Quantities

- a) A school's water supply and distribution system shall be capable, at all times, of maintaining not less than 5 pounds static pressure at every fixture.
- b) A schools water supply and distribution system shall be capable of delivering not less than 10 gpd per occupant thereof in every primary school (kindergarten to and including 8th grade), and not less than 20 gpd per occupant thereof in every secondary school (9th grade and higher). Where a cafeteria is provided, these minimum quantities shall be increased not less than one gpd per occupant. Where other than normal conditions exist (i.e. swimming pools, air conditioning, water-wash type paint booths, etc.), these figures shall be increased in an amount sufficient to accommodate the added supply demand.

SUBPART G: TOILETS, PLUMBING AND SEWAGE DISPOSAL

Section 185.700 Scope

Subpart G establishes the minimum requirements necessary to protect the health and safety of pupils against improper, unsafe or inadequate toilet facility, plumbing and sewage disposal installations and their accompanying by-products.

Section 185.710 Plumbing and Sewage Disposal Requirements

Toilet, plumbing and sewage disposal installations shall conform to all applicable requirements of "Advisory Code of Minimum Standards of Good Plumbing Practice," dated July 1, 1959, known as the "Illinois State Plumbing Code," 77 Ill. Adm. Code 890 published by the Illinois Department of Public Health, Division of Sanitary Engineering, except as noted below:

- a) Administrative Authority" and "Plumbing Inspector" as referred to therein shall be considered as meaning "Enforcing Authority" for the purpose of this Part.
- b) For the purposes of this Part, the following parts of the referenced Illinois State Plumbing Code shall be disregarded:
  - 1) Specific references to buildings other than schools.
  - 2) Pages "v to ix" inclusive
  - 3) Section 2.1 "Conformance with Code."
  - 4) Section 2.5.1 "Existing Buildings."
  - 5) Section 2.12 "Industrial Wastes."
  - 6) Section 2.26 "Ventilation Ducts."
  - 7) Section 6.14.1 "Backwater Valves-Installation."
  - 8) Section 7.7.1 "Water Closets-Public Use."
  - 9) Section 7.7.7 "Water Closets-Location."
  - 10) Section 7.8.8 "Urinals-Location."
  - 11) Section 7.14.13 "Drinking Fountains-Location."
  - 12) Section 10.6.1 "Water Service Pipe-Underground Pipe."
  - 13) Section 14.17.1 "Requirements for Plumbing Permits."
  - 14) Section 14.17.3 "Enforcement."

(Editor's Note: The references in paragraph (b)(2) of this Section to the Illinois State Plumbing Code (77 Ill. Adm. Code 890) refer to versions rescinded many years ago. Thus, no cross references to the codified version can be given. The State Board of Education will amend this Section to update these references.)

- c) The occupancy of any room or space (for determining plumbing fixture requirements) shall be equal to (1) actual occupancy or (2) 60% of exit occupancy as calculated by table under Section 185.310 (f), whichever is the larger, considering only those rooms which will be used simultaneously.

Section 185.720 Domestic Water Heaters - With Fuel Burners

- a) Gas fired water heaters and their installation shall comply with applicable requirements of NFPA 54-1959 and NFPA 58-1961 and USASI Z-21.10.1.
- b) Oil fired water heaters and their installation shall comply with the applicable requirements of NFPA 31-1961.
- c) As a minimum each gas, oil and solid fuel fired hot water heater shall be provided with a smoke pipe, vent or breaching, barometric draft adjuster or draft diverter, multiple ASME Boiler Code safety relief valves, valved drain, fuel burner, adequate, reliable combustion air supply, multiple operating and safety controls, manual fuel valves, gas regulators and all other requirements of hot water heating boilers for same fuel input, as provided in Subpart D. Each such heater shall be controlled by approved operating and safety devices which will automatically shut off the fuel supply in the event of failure of control system or in the event of current or air pressure failure.
- d) Cold water and hot water return connections to heaters shall be valved.

Section 185.730 Domestic Water Heaters - Water, Steam or Electric Heated

- a) Each indirect, below-the-water-line boiler, water heated, steam heated, or electric heated hot water heater shall be provided with multiple ASME Boiler Code safety relief valves, valved drains, inlet water valves, multiple operating and safety controls, and all other requirements of hot water heating boilers for same heat input except without fuel burning equipment, as replaced by coils or heaters as provided in Subpart D. Electric hot water heaters shall be controlled by UL approved multiple devices. Each hot water or steam heated hot water heater shall be provided with control system which will automatically close all control valves' and stop circulating pumps on the heating supply side in event of failure of the control system or in the event of current or air pressure failure.
- b) Cold water and hot water return connections to heaters shall be valved.
- c) Steam or water coil heaters and their installations shall comply with ASHE Code, Section VIII, Unfired Vessels, 1966.
- d) Electric water heaters and their installations shall comply with USASI C72.1-1949; NEMA WHI-1949; UL-174.5

Section 185.740 Maximum Water Temperatures

- a) The temperatures of water supplied to showers, bath tubs, foot bath, lavatories, sinks and other facilities used by students shall not be more than 130° F.
- b) Outlet pipe for each main mixing valve supplying mixed water to fixtures shall be provided with a water thermometer of such type and so located as to permit it to be easily read. Each cold water and each hot water inlet connection to each mixing valve (and to each device which could permit back flow from one main to the other) shall be provided with a stop and check valve or other device to prevent backflow into cold water or hot water mains.

SUBPART H: SEATING

Section 185.800 Scope

- a) Established in this Subpart are the minimum requirements necessary to safeguard pupils against the improper and unsafe installation or use of chairs, benches, bleachers, and other seating.
- b) The capacity of seating shall not exceed the maximum capacity in any room or space as provided for under Section 185.310 (f). Excess seats shall be removed.

Section 185.810 Assembly Occupancy Seating (Other than Bleachers)

- a) Chairs and benches in Assembly Occupancies (Section 185.310 (e)) shall be securely fastened to the floor except as permitted by Section 185.800 (a). All seats in balconies and galleries shall be securely fastened to the floor, except that, in those railed-in enclosures, boxes and loges with level floors and not more than 14 seats, such seats need not be fastened.
- b) Chairs and benches need not be secured to the floor in cafeterias and in other Assembly Occupancies where such is impracticable and specific approval for the omission thereof is obtained from the Enforcing Authority.
- c) The capacity of benches or other seating (seats without dividing arms) shall be determined on the basis of 18 in. per person.
- d) Row spacing.
  - 1) The spacing of chair and bench rows from back to back shall be not less than 32 in. or less than 29 in. plus the thickness of the back, whichever is greater. There shall be a space of not less than 12 in. between the back of one chair and the front of the folded down portion of the chair immediately behind, measured between plumb lines.
  - 2)- Rows, between aisles, shall provide seating for not more than 14 persons. Rows opening onto an aisle at one end only shall provide seating for not more than 7 persons.

EXCEPTION: There shall be no limitation on number of persons in rows between aisles where-the seats have automatic self-raising seat devices and the spacing of such rows is at least 39 in. from back to back.
  - 3) Platforms or benches formed to receive seats in balconies shall be not less than 32 in. wide or more than 21 in. high -except immediately above or below a cross aisle and the longitudinal aisles shall have one step between each platform not to exceed 10 1/2 in. in height.
- e) Aisles.
  - 1) Aisles shall be not less than 3 ft. wide except that where not more than 60 persons are. to be served by an aisle its width may be reduced to not less than 30 in.

- 2) Steps shall not be placed in aisles to overcome differences in level unless the gradient exceeds 1 ft. rise in 10 ft. of run, except as permitted under Section 185.810 (d)(3). Steps in aisles shall be adequately illuminated and shall conform to Class A or B exit stairs as to rise and tread.
- 3) Not more than 10 rows of seats nor 12 ft. of rise shall be placed between cross aisles where steps are provided in the main aisles to overcome differences in level.
- 4) Cross aisles shall be not less than 44 in. wide, unless railed away from the seats fronting thereon. If so railed, the width may be reduced to not less than 36 in.
- 5) All aisles shall be kept unobstructed and no persons other than authorized personnel shall be allowed to occupy any aisle while the Assembly Occupancy is being occupied.
- 6) The maximum slope in aisles on the main floor shall be one in six for the first six rows from the rear; one in eight for the next six rows from the rear and one in ten for the remaining rows. All gradients of sloping aisles shall be provided with a non-slip surface.
- 7) Every longitudinal aisle on the main floor shall be increased in width toward the exit at the rate of one-half inch for every ten ft., for aisles having seats on one side only. Every longitudinal aisle shall be increased in width toward the exit at the rate of one-half inch for every five ft. for aisles having seats on both sides. The average width may be computed for the amount of increase required, when having parallel aisles.
- 8) The width of aisles in balconies shall be computed the same as the aisles on the main floor. However, aisles widths in balconies may be computed by the length between cross aisles.
- 9) There shall not be more than 10 rows between the front of a balcony and rear wall without an intervening cross aisle having at least 44 in. unobstructed width.
- 10) Cross aisles, where provided shall have access to exits or to approved paths of travel to exits.

Section 185.820 Educational and Special Educational Occupancy Seating (Other than Bleachers)

- a) Seats secured to the floor in Educational and Special Educational Occupancy areas shall be governed by rules applicable to Assembly Occupancies as to number of seats per row, aisles, exits, and distances of travel to nearest exit except the minimum width of aisles may be reduced to not less than 18 in.
- b) Chairs, benches, or tables not secured to the floor in Educational and Special Educational Occupancy areas shall not be restricted as to arrangement.

Section 185.830 Bleachers

Grandstands, indoor and outdoor, and other places of outdoor assembly shall comply with the requirements of NFPA No. 102-1957 and Chapter I of NFPA No. 101-1963.

Section 185. TABLE A Maximum Fire Area

MAXIMUM FIRE AREA

Construction Type	Enclosed Interior	
	Unsprinklered	Sprinklered
I	NL	NL
II	NL	NL
III	NL	NL
IV	NL	NL
VI	10,000	20,000

  

Construction Type	Open Interior	
	Unsprinklered	Sprinklered
I	NL	NL
II	45,000	NL
III	45,000	NL
IV	30,000	NL
VI	8,000	16,000

<sup>1</sup>Maximum fire area figures shown for Type V construction may be increased 100% when all exterior walls are noncombustible or have a fire resistance rating of not less than one hour.

Section 185.TABLE B Maximum Height

MAXIMUM HEIGHT

Construction Type	Unsprinklered	Sprinklered
I	6(A)	NL
II	4	5
III	4	5
IV(B)	4	5
V(C)	2	3

(A)Unlimited height shall be permitted for Type I buildings where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than two hours.

(B)The maximum height for unsprinklered and sprinklered Type IV buildings may be increased to five and six stories respectively where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than one hour. (Concrete pan construction with 2 1/2" minimum floor thickness or wood joists with metal lath and plaster is acceptable);

(C)The maximum height for unsprinklered and sprinklered Type V -buildings may be increased to three stories and four stories respectively, where all exterior walls and interior bearing walls are of masonry construction.

Section 185.TABLE C Maximum Fire Area (SQ. FT.)(A)

TABLE C  
MAXIMUM FIRE AREA (SQ. FT.)(A)

Construction Type	2 Story Bldgs.		3 Story Bldgs.		Over 3-Story Bldgs.	
	Unspr.	Sprink.	Unspr.	Sprink.	Unspr.	Sprink.
I	NL	NL	NL	NL	NL	NL
II	NL	NL	40,000	NL	20,000	NL
III	NL	NL	40,000	NL	20,000	NL
IV(B)	NL	NL	40,000	NL	20,000	NL
V(C)	8,000	16,000	NP(D)	10,000	NP	NP(E)

(A)The maximum area figures set forth in this table shall apply to all fire areas regardless of the floor on which such areas are located, except that a 50% increase in area shall be permitted for those fire areas located on a street floor.

(B)The maximum fire area for Type IV buildings may be increased 50% where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than one hour. (Concrete pan construction with 2 1/2" minimum floor thickness or wood joists with metal lath and plaster is acceptable.)

(C)The maximum fire area shown in the above table for Type V buildings may be increased 100% where all exterior walls and interior bearing walls are of masonry construction.

(D)Where permitted under Section 185.330 (b)(1)(C), maximum area shall be 4,000 sq. ft. with increase, as permitted under Footnote "A" above, applicable thereto.

(E)Where permitted under Section 185.330 (b)(1)(C), maximum area shall be 5,000 sq. ft. with increase, as permitted under Footnote "A" above, applicable thereto.

Section 185.TABLE D Maximum Height

MAXIMUM HEIGHT

Construction Type	Unsprinklered	Sprinklered
I	5(A)	NL
II	3	5
III	3	5
IV(B)	3	5
V	2	3(C)

(A)Unlimited height shall be permitted for Type I buildings where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than two hours.

(B)The maximum height for unsprinklered and sprinklered Type IV buildings may be increased to four and six stories respectively, where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than one hour. (Concrete pan floor construction with 2 1/2" minimum thickness of wood joists with metal lath and plaster is acceptable.)

(C)The maximum height for sprinklered, Type V buildings may be increased to four stories when all exterior walls and interior bearing walls are of masonry construction.

Section 185.TABLE E Maximum Fire Area (SQ. FT.)(A)

TABLE E  
MAXIMUM FIRE AREA (SQ. FT.)(A)

Construction Type	2 Story Bldgs.		3 Story Bldgs.		Over 3-Story Bldgs.	
	Unspr.	Sprink.	Unspr.	Sprink.	Unspr.	Sprink.
I	NL	NL	NL	NL	NL	NL
II	40,000	NL	20,000	NL	NP	NL
III	40,000	NL	20,000	NL	NP	NL
IV(B)	40,000	NL	20,000	NL	NP(D)	NL
V(C)	6,000	12,000	NP	12,000	NP	NP(E)

(A)The maximum area figures set forth in this table shall apply to all fire areas regardless of the floor on which such areas are located, except that 50% increase in area shall be permitted for those fire areas located on a street floor.

(B)The maximum fire area figures for Type IV buildings may be increased 50% where all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than one hour. (Concrete pan floor construction with 2 1/2" minimum thickness of wood joists with metal lath and plaster is acceptable.)

(C)The maximum fire area for Type V buildings may be increased 50% where all exterior walls and interior bearing walls are of masonry construction.

(D)The maximum fire area for those unsprinklered Type IV buildings permitted to be four stories in height Section 185.340 (b)(1)(B) shall be 20,000 sq. ft.

(E)The maximum fire area for those sprinklered Type V buildings permitted to be four stories in-height Section 185.340 (b)(1)(C) shall be 10,000 sq. ft.

Section 185.TABLE F Maximum Height

MAXIMUM HEIGHT

Construction Type	Unsprinklered	Sprinklered
I	5(A)	NL
II	3	4
III	3	4
IV	3	4
v	2	3

(A)Unlimited height shall be permitted for Type I buildings when all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than 2 hours.

Section 185-TABLE G Maximum Fire Area (SQ. FT.)(A)

MAXIMUM FIRE AREA (SQ. FT.)(A)

Construction Type	2 Story Bldgs.		3 Story Bldgs.		Over 3-Story Bldgs.	
	Unspr.	Sprink.	Unspr.	Sprink.	Unspr.	Sprink.
I	NL	NL	NL	NL	NL	NL
II	30,000	NL	16,000	24,000	NP	12,000
III	30,000	NL	16,000	24,000	NP	12,000
IV(B)	20,000	NL	10,000	24,000	NP	12,000
V(C)	4,000	8,000	NP	6,000	NP	NP

(A)The maximum fire area figures set forth in this table shall apply to all fire areas regardless of the floor on which such areas are located, except that a 50% increase in area shall be permitted for those fire areas located on a street floor.

(B)The maximum fire area for Type IV buildings may be increased 50% when all floor assemblies and the walls and structural members supporting such assemblies have a fire resistance rating of not less than one hour. (Concrete pan floor construction with 2 1/2" minimum thickness or wood joists with metal lath and plaster is acceptable.

(C)The maximum fire area for Type V buildings may be increased 50% when all exterior walls are of noncombustible construction or have a fire resistance rating of not less than one hour.

23 ILLINOIS ADMINISTRATIVE CODE  
SUBTITLE A

CH. I, S. 185.TABLE H  
SUBCHAPTER d

Section 185.TABLE H Dimensional and Definitive Limitations of Class A, B, and C Exit Stairs

	Class A	Class B	Class C
Minimum width clear of all obstructions except handrails which may project not more than 3 1/2 in. each side.	44 in.	44 in. 36 in. when total capacity is less than 50	30 in.
Maximum height of risers	7 1/2 in.	8 in.	8 in.
Min. width of tread exclusive of nosing or projection <sup>1</sup>	10 in.	9 in.	9 in.
Winders <sup>1</sup>	None	None	None <sup>2</sup>
Max. height between landings	8 ft.- 6 in.	10 ft.	12 ft.
Min. dimension of landings in direction of travel	44 in.	44 in.	30 in.
Encroachment on required width of landings by swing of doors	None	Not more than 25% of the required width at any point of swing	Same as for Class B
Minimum number of steps in flight	3	3	No requirement

<sup>1</sup>curved stairs shall be permitted where the radius at the inner edges is not less than 15 ft. and the minimum width of tread, as limited above, is measured 18 in. from the inside edge.

<sup>2</sup>Winders may be permitted for Class C stairs serving as a means of exit for not more than 20 persons where specifically approved by the Enforcing Authority.

Section 185.TABLE I Dimensional and Definitive Limitations of Class A, B, and C Ramps

	Class A	Class B	Class C
Minimum clear width exclusive of handrails which may project not more than 3 1/2 in. each side.	44 in.	44 in.	30 in.
Maximum slope	1 in 12	1 in 8	1 in 6
Maximum height between landings Limit	No	12 ft.	12 ft.
Handrails (See Section 185.370 (d)(9))	Not Required	Both Sides	One side only, except both sides when more than 40 in. wide

Section 185.TABLE J Dimensional and Definitive Limitations of Class A, B, and C Fire Escapes

	TABLE		
	Class A	Class B	Class C
Minimum Widths	44 in. clear between rails	28 in. clear between rails	22 in. clear between rails
Minimum horizontal dimension of any balcony, landing or platform	44 in.	28 in.	22 in.
Maximum rise	7 1/2 in.	8 in.	9 in.
Minimum tread, exclusive of nosing or overlap	10 in.	9 in.	8 in.
Minimum nosing or overlap	1 in.	1 in.	No requirement
Tread Construction	Solid, or skirt type with non-slip treads, 1/2 in. diameter perforations permitted flat metal bars	Solid or skirt type with non-slip treads, 1/2 in diameter perforations permitted, or on edge, or square bars secured against turning, space 1 1/4 in. max. on centers	Flat metal bars on edge, or square bars secured against turning spaced 1 1/2 in. max. on centers
Winders (Spiral)	Not Permitted	Not Permitted	Not Permitted
Risers	If solid or skirt type, 1 in. min. space for drainage	If solid or skirt type, 1 in. min. space for drainage	No Requirement
Maximum height between landings	12 ft.	12 ft.	No Requirement
Headroom Minimum	7 ft. 6 in.	7 ft.	6 ft. 6 in.

23 ILLINOIS ADMINISTRATIVE CODE  
SUBTITLE A

CH. I, S. 185.TABLE J  
SUBCHAPTER d

Handrails	Both sides, intermediate handrail if over 66 in. wide	Both sides, intermediate handrail if over 66 in. wide	Both sides
Access to escape	Door 36 in. by 6 ft. 6 in. min.	Door 30 in. by 6 ft. 6 in. min.	Windows at least 30 in. by 36 in. clear opening
Discharge to ground	Permanent stairs continuous to ground	Swinging stair permitted when approved by the Enforcing Authority	Swinging stair or ladder permitted when approved by the Enforcing Authority
Level of Access Opening	Level with floor	Level with floor except that an opening 21 in. above floor permitted if provided with permanent access stair	Not over 36 in. above floor

