

**FIRE PROTECTION HISTORY-PART 246: 1919  
(SCHOOL BUILDINGS)**

By Richard Schulte

The twenty-third Annual Meeting of the National Fire Protection Association was held in Ottawa, Canada in May, 1919. Among the topics of discussion at this meeting were the fire safety provisions for the design of schools. The following is a transcript of the portion of the discussion dealing with school building construction:

*“Mr. Forster: I will now ask that Mr. Frank Irving Cooper, of Boston, [to] take the floor to present the section on schools.*

**PART II.**

*[This report has been submitted to ballot of the committee, which consists of eighteen members, of whom ten have voted affirmatively, and eight have refrained from voting.]*

**SAFETY TO LIFE IN SCHOOLS.**

*Although it is not possible at the present time to present to the Association definite recommendations for adoption in relation to the exit capacities and permissible numbers of occupants of school buildings, the Committee has devoted considerable thought to this subject. The skeleton report submitted herewith indicates the lines along which the problems are being attacked, and may be the means of eliciting helpful suggestions and criticisms.*

*It will be observed that the general outline follows as closely as may be the plan already adopted in the case of factory buildings.*

**DEFINITIONS AND STANDARDS.**

**1. Types of Schoolhouse Building Construction.**

*(1) Class A construction means a building of fire-resistive construction in its walls, floors, stairways, and ceilings, and with wood finish, wood or composition floor surface and wood roof construction over fire-resistive ceiling.*

(2) *Class B construction means a building with masonry walls, fire-resistive corridors and stairways, but with ordinary construction otherwise, i.e., wooden joists, partitions, roof and finish.*

(3) *Class C construction means a building with masonry walls, but otherwise ordinary or joist construction and wood finish.*

(4) *Class D construction means a frame building with wood above foundation with or without slate or other semi-fire-resistive material on roof.*

*Note.—The foregoing classifications are recognized by school architects and educators. School buildings of fire-resistive construction throughout are very rare, as other than wood floors are not favored by educators. From a life safety standpoint Class A buildings may be grouped with those of strictly fire-resistive construction.*

### **Protection of Vertical Openings.**

*2. Standard protection of all vertical openings is recommended, and the absence of such protection shall be penalized by a reduction of the permissible number of occupants as in the case of factory buildings. A detailed scale of penalties will be submitted after further study.*

### **Number and Location of Exits.**

*3. Not less than two inside stairs remote from each other shall be provided from every floor, including basements.*

*4. Exits shall be so arranged with regard to corridors that there are no pockets or dead ends in which pupils might be trapped.*

*5. Exits shall be so located that no point in any floor area served by them shall be more than 75 feet distant along the line of travel from an exit, except in buildings of Class A construction, in which a distance of 100 feet may be permitted.*

*6. Every room habitually used by more than three pupils shall have at least two means of egress. In case these egresses finally open upon the same corridor, the openings into the corridor shall be on opposite side of a smoke-resistive door, and shall give access to independent stairways.*

## **Stair Construction.**

**7.** *The standards of the Building Code of the National Board of Fire Underwriters as to stair construction are generally applicable to school buildings, except that the following requirements shall in every case be met.*

*(1) Stairways in new buildings shall in every case be enclosed in fire-resistive walls and entered through self-closing smoke-resistive doors.*

*(2) The space beneath every stairway built wholly or in part of combustible material shall be completely enclosed without door or other opening, adequate ventilation being provided to prevent dry rot.*

*(3) Solid balustrades only shall be provided where balustrades are necessary.*

*(4) Every stairway over 5 feet in width shall be provided with continuous intermediate hand-rail substantially supported.*

*(5) Risers shall not exceed 7 inches in height, and treads, exclusive of nosing, shall not exceed 10½ inches in width. Treads 10 inches wide may be permitted subject to a penalty in calculating the stair capacity.*

*(6) Stairways exceeding 9 feet in height shall have an intermediate landing equal in length to the width of the stair. In stairways with change of direction the corners of the landing shall be filled in to the height of the handrail, and the handrail on the wall side shall be continuous around the landing in the form of a semi-circle, with the newel of the stair as the centre.*

*(7) Stairs shall always open directly on the street or to a yard or court connected with the street.*

*(8) Winders shall be absolutely prohibited.*

*(9) Vestibules shall be so designed as not to exceed the width of the door frame at the door opening, and the walls shall extend in a straight line from the door frame to the widest point at the foot of the stairs.*

*(10) Stairways from corridors to main exits shall not be split into two flights discharging opposite each other to the same exit door.*

*(11) All stairs leading to basements shall be enclosed by fire-resistive walls, and smoke resistive doors shall be provided at top and bottom of such stairs.*

*Note.—By a smoke-resistive door is meant a light door of solid construction without thin wood panels, and usually provided with a wired-glass pane.*

### **Stairs (Landings).**

*8. No door shall open immediately upon a stairway, but a landing at least the width of the door shall be provided between such door and stairway. Landings 6 inches wider than door when open shall be provided between egress doors and a step down.*

### **Outside Stairs.**

*9. Outside stairs shall be prohibited in new school buildings.*

*10. Outside stairs which do not comply with the Specifications for Outside Stairs approved by the National Fire Protection Association shall be disregarded in determining exit capacities of existing school buildings.*

*11. Outside stairs on existing buildings which comply with the approved specifications and with such other requirements as this Committee may as the result of its further study specify for safe use by school children, shall be rated at one-half the capacity of inside stairs calculated in the manner provided by these rules.*

### **Horizontal Exits.**

*12. The standards of the National Board Building Code as to horizontal exits are generally applicable to school buildings, except that doors shall be of smoke-resistive type as defined in these rules, that gradients shall in no case exceed 1 foot in 8 feet or be more than 8 feet in length, and that the floor of any bridge or balcony shall be not more than 7 inches below the door sill opening upon it.*

*13. Where two stairways leading into a basement are separated by a partition, such partition shall be of fire-resistive construction, and a smoke-resistive door shall be installed therein.*

*Note.—In cases where it is necessary to keep the door ordinarily locked (as when the partition separates girls and boys), the means of locking shall be by an approved device that will permit the door to be opened readily from either side in the event of fire.*

## **Doors.**

**14.** *Smoke-resistive doors are preferable in school buildings to standard fire doors, as the latter may be too heavy for the pupils to open. (See definition under Stair Construction above.)*

**15.** *Doors giving access to means of egress shall swing with the travel. Sliding doors are not permissible between classrooms and corridors, corridors and stairways, or stairways and the outer air.*

**16.** *Doors when open shall not reduce the effective width of corridors, or stairs.*

**17.** *Doors of rooms used by pupils shall have locks of such construction that they will at all times open readily from the inside without the use of keys.*

**18.** *The glass panels of doors opening on a corridor shall be wired glass.*

**19.** *Revolving doors shall not be used as means of exit.*

**20.** *Exterior doors shall have glass panes and shall be operated by bars or other panic-proof hardware device.*

## **Width of Doors.**

**21.** *No door used for egress by pupils shall be less than 3 feet or more than 3 feet 2 inches wide, except double doors, which shall be not less than 2 feet 6 inches nor more than 2 feet 8 inches wide each.*

## **Doorways.**

**22.** *The aggregate clear width of doorways serving as an exit from any room or floor area to a hallway, stairs or other means of exit shall be not less than 36 inches for the first 50 persons to be accommodated thereby, and 6 inches additional for each additional 50 persons or fraction thereof.*

## **Corridors and Hallways.**

**23.** *All corridors and hallways in new buildings shall be surrounded with fire-resistive or fully fire-stopped partitions and have fire-resistive floor construction.*

**24.** *Corridors shall be straight, giving clear view of the stairway to be used.*

**25.** *Corridors shall not be less than 4 feet in width. Corridors serving as means of exit shall be at least equal in width to the width of stairways or corridors leading to them.*

**26.** *Corridor system of a building shall not be involved and shall not have dead ends or extend around corners out of sight of a means of egress.*

**27.** *Projections into corridors shall be prohibited.*

**28.** *Main corridors, passageways and hallways shall have width of at least 48 inches for the first 50 persons to be accommodated thereby, and 6 inches additional for each additional 50 persons or fraction thereof.*

*Note.—The following specifications and illustration exemplify what is meant by "fully fire-stopped by":*

*(1) all elevator wells and light shafts, unless built of brick, shall be filled in flush between the wooden studs with fire-resistive materials and lined with metal or plastered on metallic lathing, and all woodwork inside of such wells or shafts be lined with tin plate, lock-jointed.*

*(2) Where floor beams rest on partition caps or on girders, wall girts, or on wooden sills, fill in between such beams, from the caps, girders, girts or sills; to four inches above the plaster ground, solid with brick and mortar or other fire-resistive material.*

*(3) When floor beams in frame buildings rest on ledger boards, fire-stop thoroughly at each floor with brick and mortar resting on bridging pieces cut in between the studs, or, where practicable, on the ends of lining floor.*

*(4) In brick buildings the space between the furrings on the outside walls or on brick partitions shall be filled flush with mortar for a space of five inches in width above and below the floor beams of each story.*

*(5) Where basement or other flights of stairs are enclosed by partitions of brick or wood, the spaces between the studs or wall furrings shall be so fire-stopped with brick and mortar as to effectually prevent any fire from passing up between such studs or furrings.*

*(6) The soffits of all such enclosed stairs, and also partitions on stairway side, shall be plastered on metal lathing.*

*(7) All long flights of stairs shall have smoke-stops in each flight, constructed as follows:*

*Fill in solid between the soffit of the stair and the stair, tread with metal lath and cement plaster at the first and last steps of each flight.*

*(8) A space of at least one inch shall be left between all woodwork and the brick flues, also around all hot-air, steam and hot-water pipes; these spaces around flues and pipes, where they pass through floors, shall be stopped with metal or other fire-resistive material, smoketight. Steam and hot-water pipes shall have metal sleeves and cellars.*

*(9) All channels and pockets for gas, water and soil-pipes to be made smoke-tight at each floor.*

*(10) The space around all-metal or brick ventilating ducts shall be fire-stopped at each floor with metal or other fire-resistive material.*

### **Fire Divisions.**

*29. Buildings of more than 20 rooms shall be divided by fire-resistive partitions into two or more sections connected by horizontal exits through or around the dividing partitions. Each section shall have one or more stairways, including one enclosed stairway.*

### **Assembly Halls.**

*30. Where the seats in a school assembly hall are firmly secured to the floor, the requirements of the National Board Building Code as to capacity, seats, gallery platforms, aisles, cross aisles, steps in exits, floors at exits, passages, and emergency exits of theatres are applicable, except as hereinafter provided.*

*31. Where the seats are not fixed, the requirements of Part XXXIII of the National Board Building Code relating to assembly halls other than theatres are applicable, except that in cases where seats are fastened together in rows, but not permanently secured to the floor, the capacity of the hall as permitted by the Code shall be reduced by one-third, and except as otherwise hereinafter provided.*

*32. No room above the second floor in a school building shall be used as an assembly hall.*

*33. Where an assembly hall is located above the first floor of a school building, the seating capacity which would be permitted in the same on the first floor shall be reduced by one-third.*

### **Class Rooms.**

- 34.** *All class rooms shall have aisles between desks and aisles along the walls.*
- 35.** *In primary schools aisles between desks shall be at least 17 inches wide and wall aisles 2 feet 4 inches wide.*
- 36.** *In grammar schools aisles between desks shall be at least 18 inches wide and wall aisles 2 feet 6 inches wide.*
- 37.** *In high schools aisles between desks shall be at least 20 inches wide and wall aisles 3 feet wide.*

*Note.—The above are merely minimum widths. There is no objection to having wider aisles where this is considered desirable for administrative reasons.*

### **Building Height.**

- 38.** *No building accommodating primary or intermediate grades or pupils averaging 14 years or less shall be more than 3 stories nor the top floor more than 35 feet above grade at any outside door.*

### **Basements.**

- 39.** *Class, recitation or study rooms shall not be located in basements if the floor levels are more than 2 feet below grade. In such rooms in existing buildings the permissible number of occupants shall be reduced by 10 per cent for each foot of rise to the outside exit.*
- 40.** *Except the space used for heating apparatus and mechanical equipment, basements are regarded as undesirable in school buildings. Where basements exist, they shall be properly cut off from the rest of the building.*

### **Boiler, Furnace, and Fuel Rooms.**

- 41.** *Boiler, furnace, and fuel rooms shall be of thoroughly fire-resistive construction. They shall preferably be outside the building. If inside the building, they shall be cut off from the balance of the building by thoroughly fire-resistive walls. They shall not be under corridors, vestibules, or stairways. Openings from these rooms to the basement shall be provided with standard self-closing fire doors. It is best to have no opening from the basement to the boiler room, but to have the boiler room approached through a covered passageway connecting an outside basement door and an outside door to boiler room.*



*42. There shall be not less than one foot in height of open-air space between the tops of furnace or boiler casing or any smoke-pipe and the ceiling.*

*43. Floors over boiler and furnace rooms shall be of fire-resistive construction.*

**Elevators.**

*44. All elevators shall be enclosed in fire-resistive walls; doors to each shall be of standard construction and equipment.*

**Storage Rooms.**

*45. Storage rooms shall be surrounded with fire-resistive walls, and the ceilings over them shall be of wire lath and cement plaster 1 inch thick, or better.*

**Flues and Air Ducts.**

*46. No wooden flue or air duct of any description shall be used for heating or ventilating purposes.*

**METHOD OF ESTABLISHING ALLOWABLE NUMBER OF OCCUPANTS.**

*The same general method as that approved by the Association in the case of factory buildings is proposed.*

*47. For life safety purposes school buildings will be treated in three groups: (1) Fire-resistive and "Class A" construction; (2) Class B construction; and (3) Class C and Class D construction.*

*Each of these classes will then be subdivided into buildings having and not having fire-resistive or fully fire-stopped corridors, with a further subdivision as between "open stairs," "stairs enclosed or protected," and "all vertical openings protected," as in the factory rules.*

*48. In establishing credits and penalties for buildings under the headings already indicated sprinkler protection in basement, sprinkler protection up to the top floor of the school, and entire sprinkler protection, will probably be substituted for the high, moderate and low hazard occupancy classifications adopted for factories.*

**49.** Due to the constantly changing methods of utilizing school buildings, it is proposed to base required exit capacities upon the total area. *The units suggested are one person for each 15 square feet in rooms used for purposes of instruction, one person, for each 6 square feet in assembly halls, one person for each 32 square feet in workshops, and one person for each 40 square feet in gymnasiums. The figure for gymnasiums is tentative only.*

**50.** Allowance will be made in respect of horizontal exits as in the factory rules, but the permissible increase over the actual capacity of the stairs in the connected sections or buildings has been reserved for further consideration.

### **HOUSEKEEPING AND MANAGEMENT.**

Although matters of housekeeping and management are in a different class from constructional features, their importance in school fire protection is so great that the Committee has felt justified in preparing a separate memorandum with regard to them.

Due to the special nature of the occupancy, the hazard to life in school fires is of exceptional severity. Observance of the following precautions will reduce this exceptional hazard to a minimum:

**(1)** *Every building shall be equipped with an approved form of fire alarm system arranged to give a rapid dismissal signal which shall be the same in all schools in the same city. Signal gongs shall be placed on each floor, including the basement, and shall be used for dismissal only, signals to be operated by break-glass signal stations placed on each floor and a special operating station placed in the principal's office.*

*Note.—It is recommended that this signal be the 4-4 signal.*

**(2)** *Fire drills organized in general accordance with the suggestions already adopted and promulgated by the National Fire Protection Association shall be held at frequent intervals.*

*Note.—The recommendations in this report will, if adopted, involve some minor changes when a reprint of the pamphlet incorporating the original suggestions becomes necessary.*

**(3)** *Stairway terminals shall be kept free and clear of any and all obstructions.*

**(4)** *All stairways, landings and passageways leading thereto shall be kept free from all furniture or anything that blocks or narrows the exits.*

(5) All clothes closets on half-story levels, opening on line of stairway, shall be discontinued unless there is a separate stairway leading thereto.

(6) All doors of class rooms shall be kept entirely clear of encroaching furniture. There shall be a clear space at each door, and all seats that interfere therewith shall be removed. Furniture shall be removed from all aisles and passageways, which must be kept clear at all times.

(7) Hooks where used to hold stairway doors open, shall be replaced with automatic catches or holding devices.

(8) *Exit signs shall be provided and indicated by approved red lights*, which shall be independent of the lighting system used for the rest of the building. The letters and figures on signs, shall be not less than five inches high. All signs shall be of substantial material.

(9) All doors from assembly rooms and doors from hallways shall be designated by exit signs, numbered on all floors alike; for instance, a stairway shall be numbered the same on all floors. After all stairways have been thus numbered, the succeeding numbers may be used for any other exits.

(10) In all buildings used as night schools and in all school buildings wherein lectures, etc., are given after school hours or after sunset to the general public, signs lighted by approved red lights shall be provided over all exit doors and stairways, and outside fire escapes shall be properly illuminated at night.

(11) Exit signs shall be placed at all doors opening on stairs or passages leading to outside exits.

(12) Where entrances to stairways through halls or other exits do not permit of exit signs being readily seen, additional sign or signs shall be placed and, if necessary, arranged to project from side wall.

(13) Attics and open cellars shall not be used for the storage of furniture, books, lumber, etc.

(14) Pupils' individual desks, wherein pockets (or other receptacles) are provided for books, must be cleared out and kept clean of all unnecessary accumulations of paper, rags, etc.

(15) Students' benches and the floor in carpentry class rooms shall be kept clear of all accumulations of sawdust, shavings and litter of all kinds.

(16) Cotton waste shall be kept in metal boxes or cans with self-closing tops.

(17) Metal receptacles, with automatic closing covers, shall be provided for waste paper and refuse in all playrooms and lunch-rooms. Each receptacle shall be about the size of the standard ash can. There shall be one can for each 500 boys and one can for each 500 girls in their respective playrooms.

(18) Unprotected wood enclosures shall not be maintained about boilers, machinery, pumps, coal bins, etc.

(19) In wardrobes, all steam coils, radiators or pipes shall be protected by a screen or heavy wire netting so that clothing may not come in contact therewith.

(20) Swinging gas brackets shall not be used for any purpose. Only short, stiff brackets shall be used.

(21) Rubber hose shall not be used for connections for gas ranges or gas stoves, nor for burners at tables or benches.

(22) Woodwork at or near gas stoves shall be carefully protected by stone linings or by metal lined with asbestos.

(23) Gas stoves or hot plates shall not be placed upon a wood-top table or other similar surface, unprotected by stone, by metal with asbestos beneath same, or by other incombustible materials.

(24) Extra chemical fire extinguishers shall be provided in each room where there are classes in carpentry, chemistry, sewing, etc., or in any other rooms containing combustible material of any kind, other than books. Additional extinguishers shall be also provided on floors having more than 10,000 square feet area.

(25) Water connection with length of small hose attached, shall be placed in all furnace rooms for use about ash-pits, and similar connections shall be placed where waste paper or other refuse is burned.

(26) No oil of any kind shall be applied to wood floors.

**Mr. Cooper:** The Committee presents the above section simply as a report of progress. I should say that I was asked to come onto this Committee purely from the fact of my experience in school planning and the fact that **the National Education Association has a committee on this very matter**, of which I am chairman. The report that we have presented is tentative; it is not ideal, it is full of holes, and no one appreciates it more than those who had to do with drawing it up.

Four classes of schoolhouse construction have been presented to us by a committee from the School Accounting Officers' Association, who have had a committee on the question of type of schoolhouse buildings. *A member of that committee is Mr. William B. Ittner (a member of the N.F.P.A.), who is chairman of the American Institute of Architects' committee on this very subject.* Those two committees have agreed on the types of construction, and have presented this text to be incorporated in our report. I understand that the American Institute of Architects is considering this matter at its annual convention in Nashville.

Under Number and Location of Exits, Article 5, it has been suggested and accepted by the Committee that the words in the second line, "Along the line of travel," should be omitted. It would then read, "Exits shall be so located that no point in any floor area served by them shall be more than seventy-five feet distant from an exit," etc. Under Section 7, paragraph 4, "Every stairway over five feet in width," that paragraph will probably be rewritten. The Committee is considering what width it would recommend for the stairway in a school buildings—that is, the minimum width. It is decided that paragraph 5, *"Risings shall not exceed seven inches in height, and treads, exclusive of nosing, shall not exceed 10[-]½ inches in width," shall be changed to read, "Treads, exclusive of nosing, shall not be less than 9[-]½ or more than 10[-]½ inches in width."*

*The question has come up as to whether we would recommend a fire door at the bottom and the top of basement stairs. Some of the committee feel strenuously that a door should be placed in both of these positions.* If one door only is to be put in, it should be at the bottom of the stairs, but a case is known to the Committee where a building was destroyed and loss of life occurred in a school building where one of the instructors went to the basement and opened the door to see what sort of a fire was under way; the fire was so great that the hot air and flame coming out immediately dropped the instructor to the floor and he was killed. The fire then rushed up the stairway and destroyed the building. If there had been a door at the top as well as at the bottom of the stairway he would have closed it behind him, presumably, and then when he opened the lower door the fire would not have rushed up the stairway. If the door is at the top of the stairs only it means that the fire and the hot air rise to the upper part of that stairway and are ready to break out. That has been the cause of loss of life in almost every one of the school fires where loss of life has occurred at the entrance or on the stairway.

*Outside Stairs, Article 9, now reads: "Outside stairs shall be prohibited in new school buildings." That has been changed to read: "Outside stairs from upper floors," realizing, of course, that there must be outside stairs or steps from the first floor. This brings out the point that this has been written, in the first place, with the idea of both the old school building and the new school building in mind; it seems almost impossible to separate the two types of school buildings. Architects wish to have some set of rules that they can place before their committees and say, "This is what is desired for the new school building." If we can have one set of rules for the new school building and another set for the old school building, I believe we shall be making progress in the right direction. In Massachusetts, after the Peabody fire, there was a state-wide fire committee appointed which attempted to consider what should be done in connection with each of the cities; it could not agree, and finally it was left for each city to appoint its own committee to decide what should be done, and usually the fire chief of the town or the city was made a member of the committee.*

*Horizontal Exits, Article 12, in the fourth line, reads: "Or be more than 8 feet in length." It has been decided to omit that part of the article, because gradients have been found in some of the western schools that were thirty or forty feet in length, and were acceptable gradients.*

*The question has come up about the width of doorways at the bottom of stairways, and the Committee is of the opinion that the total width of the doorway is not the door, but the doorway which should be of the same width as the stairs leading to it.*

*The question has come to whether the stair is to be measured between the hand rails or between the walls is under discussion.*

*Under Corridors and Hallways, Article 24, the question has been whether that read rightly in relation to the position of stairways. The idea of the Committee has been this, that no stairway should be around a corner; that is, that the corridor should lead straight to a stairway which should be at the end. There may be subsidiary stairways along the way, but one should not arrive at the end and then have to go down another passage to reach the stairway. The stairway might, however, be at a turn in the corridor; that is often found and architects desire to plan stairways in many cases so that one turns from the corridor to the right or left into the stairway hall instead of having the stairway directly at the end.*

*In Fire Divisions, Article 29, there is a very important change. It now reads: "Buildings of more than twenty rooms shall be divided by fire-resistive partitions." That has been changed to read: "Buildings or sections of buildings having a greater area than twenty thousand square feet."*

*Under Building Height, paragraph 38, the last line reading, "thirty-five feet above grade at any outside door." The Committee has been requested to make that forty feet.*

*In Article 41, Boiler, Furnace and Fuel Rooms, it has been decided by the Committee to omit the sentence reading, "They shall not be under corridors, vestibules, or stairways."*

*Article 46, Flues and Air Ducts, will have to be rewritten. It so happened that two weeks ago I visited a new school costing nearly a hundred thousand dollars—I am glad to say that it is not in Massachusetts—and found that the ventilating duct had been built of beaver-board! We should prohibit in these rules any such paper construction.*

*In Article 49 we have attempted to give some area to be allowed for each pupil in reckoning the capacity of a building. The National Education Association has been tabulating buildings in some twenty-six states, from the Atlantic to the Pacific Coast, from Minnesota to Florida. They find in checking up the space areas to different pupils such variations as this—I will read a few: Botanical Laboratories, 22 feet; Chemical Laboratories, 50 feet; in the Cooking Room, 33 feet; Commercial Room, 37 feet; Forge, 56 feet; Foundry, 83 feet— a complete hodge-podge. **It is the hope of the National Education Association to derive some number of feet that it can recommend for the various activities found in the school building, and then those dimensions will be handed to this Committee for consideration.***

*The next point, and my last one, is in relation to the title of Housekeeping and Management. It has been felt that this heading did not entirely cover what we wanted, and it has been decided to make that Equipment, Housekeeping and Management. In conclusion, I can only supplement what our chairman, Mr. Forster, has said in relation to getting advice from the members of this Association. We wish you would write to him giving in detail the points that you would like made in relation to these rules; and as the National Education Association is not to meet until July, we will say if those are received not later than August it will be sufficient for the action of the Committee. (Applause.)*

**Mr. Doull:** *I just want to suggest one or two slight changes under the section Housekeeping and Management. In paragraph 21, erase the words "rubber-hose," and insert the words "flexible tubing." That is the proper technical name and covers everything.*

*Paragraph 23 reads, "Unprotected by stone." I do not know of any better transmitter of heat for gas ranges than stone. A great many fires take place in that way. I would suggest that this paragraph read as follows: "No gas stove or hot plate shall be placed upon a wood-top table or other similar surface unless protected by two sheets of asbestos covered by two sheets of metal."*

**Mr. Cooper:** *I am sure the Committee will be glad to accept that.*

**Mr. Miller:** *May I suggest that this Committee omit efforts to embody in its reports structural requirements? I see a whole page practically devoted to fire-stops, and it is very likely when a committee of this kind goes into such details, it is going to conflict with other committees that have the formulation of such standards in hand.*

**The Chair:** *The Committee will take that into consideration, no doubt. It is moved and seconded that this section be accepted.*

*The motion was adopted.*

**Written Discussion by Mr. C. Heller.  
(San Francisco.)**

**Part 2. Schools.**

*Item 6. Attention is called to the first sentence requiring two means of exit from each classroom. There is a difference of opinion on this point among educators, some claiming that one door is better, as it gives the teacher better control over the pupils. I am inclined to favor the latter view, and **also think that requiring two exits from a classroom unless it holds, say, over 50 pupils, is stretching the safety idea too far.***



Item 7-4. I feel this paragraph should be entirely revised. The five-foot stair which is in common use in schools is inconsistent with the stair widths established by this Committee. The five-foot or 60-inch width furnishes three units or widths (3 by 20 inches); in other words, allows three files of persons, the middle one being without the support of a hand rail, a dangerous procedure where children are involved. According to the present rule, if the width of a stair were over five feet, say 66 inches, an intermediate hand rail would be required; this would divide the width into two units of 33 inches, which is too narrow for two files and unnecessarily wide for one; or into one width of 44 inches and one of 22 inches, which would allow one well-spaced double and one single file. From Mr. Cooper I understand that the school people are opposed to single files of pupils. I therefore recommend the following: *That in new buildings stairs shall be built 44 inches in width between hand rails, or in multiples thereof, with an intermediate hand rail for each such width. The specified width of 44 inches is taken from the rules for factory buildings, but it may be desirable to allow narrower widths on account of the children not taking up as much space as adults.*

Item 9. What objection is there to outside stairs on new buildings in climates not subject to freezing temperatures?

#### **Housekeeping.**

*In addition to the school fire alarm system I think that where the building is within the city limits a public or auxiliary to the nearest public fire alarm box should be installed in the principal's office*

#### **Additional Subjects.**

*It is desirable to state in the introduction that these rules apply to school buildings to be used exclusively for instruction purposes and public assembly in the auditoriums, but do not apply to boarding or reformatory schools.*

#### **Mr. Forster's Reply.**

Item 6. *I quite agree that there is a real question as to whether the ordinary small classroom needs two exit doors. It depends somewhat upon the construction. If, for example, the door into the hall leads into a corridor, at each end of which there is an enclosed stair, the matter is quite different than if there is a single open wooden stair and egress can only be secured by passing through another room to an outside stair.*

Item 7. *I think the Committee is now agreed that the 44-inch standard stair applies to schools as well as factories.*

*Item 9. I agree that an outside stair in accordance with the National Fire Protection Association specifications, in non-freezing climate, particularly on relatively low buildings, is not seriously objectionable.*

**Housekeeping and Management.**

*The suggestion that a fire alarm box or an auxiliary to this be placed in a school is a very well worth while suggestion.*

**Additional Subjects.**

*The Committee hopes in due course to study other types of school in which persons sleep or in which persons are confined.*

**The Chair:** *It is moved and seconded that the report as a whole be accepted as a progress report.*

*The motion was adopted.*

**The Chair:** *I would like further action on the Electrical Committee's report. I think for the sake of the record we should take definite action on that report approving the plan of operation outlined for the procedure of the Electrical Committee in the future. Is that your pleasure?*

*It was moved and carried that the plan of operation outlined in the report of the Electrical Committee be approved by the Association.*

**Prof. Woolson:** *I think we all appreciate very much the courtesy of Mr. Cooper in coming here and giving us the advantage of his wide experience on the particular subject of school buildings, especially as it relates to other organizations. I think we should give an expression of our appreciation of his unusually valuable co-operation as a member of the Committee on Safety to Life. I, therefore, move that the thanks of the Association be extended to Mr. Cooper for his presentation of the subject.*

*The motion was adopted."*

Of particular interest above is the discussion of the stair width and assumption of files of occupants utilizing the stairs. Also of interest is the discussion of the design occupant load factors to be utilized for various rooms and areas within a school.

\* \* \* \* \*

**Source:** *“Proceedings of the Twenty-Third Annual [NFPA] Meeting”*, Ottawa, Canada, 1919.

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