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FIRE PROTECTION HISTORY-PART 193: 1920 (EGRESS REQUIREMENTS FOR LARGE DEPARTMENT STORES)

By Richard Schulte

The Committee on Safety to Life continued its work developing egress requirements for retail stores and presented this work at the twenty-fourth Annual Meeting of the National Fire Protection Association held in Chicago in May 1920. The following is the transcript of the Committee's Report:

"*The Secretary: Mr. Forster is not present. Mr. Sidney J. Williams, a member of the Committee, will present the report in his absence.*

Report of Committee on Safety to Life.

H. W. Forster, Chairman.

David S. Beyer, Frank Irving Cooper, Henry B. Cross, F. W. Glading, C. Heller, L. H. Kunhardt, Lloyd Marshall, R. H. Newbern, William Newell, Lew R. Palmer, Frances Perkins, E. B. Tolsted, T. G. Toomey, Sidney J. Williams, J. R. Young.

[This report being merely informative has not been submitted to ballot of the committee.]

EGRESS REQUIREMENTS FOR RETAIL STORES.

1. As a portion of its 1919 report, your Committee on Safety to Life submitted a preliminary report on the subject of Egress Requirements for Retail Stores. During the past year the Committee has continued its studies, and, while the approval of the Association is not yet requested upon the work done, it is believed that the report as presented this year is likely to be modified hereafter only in so far as figures are concerned and not as regards principles.

2. Members of this Committee so far have made detailed reports upon construction, protection, and egress conditions of some thirty retail stores in the leading cities of the country.

3. A noteworthy result was secured in New York City through the co-operation of the Industrial Commission of which Miss Frances Perkins of this Committee is a member. During the Christmas rush last year store counts were made in several important stores to establish the number of customers in the building. The Committee has felt that accurate store counts and not simply conjectures should be the foundation of its egress requirements, and obviously the problem is to meet the peak load conditions which occur at Christmas. Subsequent to the preparation of our report, but prior to our annual meeting, a number of co-operating stores are to make store counts on Easter Saturday, which rep[r]esents the next greatest rush period during the merchandising year. Additional store counts are contemplated next Christmas.

4. In the following sections of this report your Committee is setting forth, in the briefest possible form, the facts agreed upon, or the tentative conclusions reached, no attempt being made at this time to put the sections into language suitable for the final draft.

Construction, Automatic Sprinkler Protection, Vertical Openings, Heights, and Areas.

5. As with the Factory Egress Code, the Committee proposes to establish the limiting conditions under which various structures may be used for retail store purposes, taking into account the inter-related factors of construction, automatic sprinkler protection, protection of vertical openings, heights, and areas. The judgment of the Committee up to the present point is indicated by the tabulation herewith.

6. It will be observed that different standards are set for existing and new buildings. The Committee is of the opinion that there should be definite provision for safety made in existing buildings as well as in new structures.

7. The tabulation is changed from the one which appeared in the 1919 report, chiefly in that buildings higher than 12 stories are permitted, because the tendency is more and more toward higher structures, and there have been changes in the area limits.

[TABLE OMITTED]

Required Horizontal Exits.

8. It is obvious that where existing buildings have areas greater than the maximum submitted under their conditions of construction and protection it will be necessary to provide horizontal exits, which naturally would be done through the erection of an independent fire wall or through fire-proof partitions, depending upon whether the building has combustible floors or fire-resistive ones. Buildings over 10 stories in height must have at least one fire wall, affording horizontal exit, from the second to the top story.

9. On existing buildings it is proposed to permit the street floor areas to exceed the upper floor areas somewhat, providing the required stairs are designed to discharge directly to the outside of the building, not making it necessary for persons in the structure to enter the street story. The street floor maximum areas on existing buildings are as follows: –

a. Up to 15 stories in height – 50,000 square feet.

b. Sixteen stories and higher – 40,000 square feet.

10. Where only a portion of the required stairs discharge directly to the outside, the increase in area allowed for the street floor over and above the area limit for the upper floors, shall be increased in proportion to the ratio which the capacity of stairs which discharge into the outside bears to the total capacity of the required stairs.

11. With new buildings, the same principle shall apply, except that the maximum street floor areas shall be as follows:–

a. Up to 15 stories – 40,000 square feet.

b. Sixteen stories and higher – 30,000 square feet.

12. The above allowance makes it possible to have fewer fire walls on the street floor of stores than above, which means that, of necessity, fire walls cannot be continuous.

13. Since for new buildings all vertical openings must be protected, and since these area allowances pertain only to buildings with fire resistive construction, there is no objection to terminating certain fire partitions at the second floor. With buildings of ordinary or mill construction, all walls must be continuous from the lowest floor level to the roof.

Mezzanine Areas.

14. All mezzanine areas shall be counted in with the floor immediately below in establishing limits of areas.

One-Story Stores.

15. Both with existing and new buildings, it is proposed that the maximum areas permitted for any building height in any one of the six main divisions of the tabulation (combinations of three types of construction, each with and without sprinklers) may be exceeded 50% where stores occupy only the street floor and basement.

16. It is not required that sales basements be cut off from the street story, but any other basement sections used for storage, shipping, or other purposes, must be effectively cut off as regards all vertical openings.

17. One-story stores are subject to the same egress requirements which are set forth hereinafter for multi-story buildings.

Area Calculations.

18. Data so far obtained indicates that it is advisable to use the following tentative figures for the number of square feet of gross area of the floors in question which shall be used as a means of establishing the population of the building.

a. Street floor – 20 square feet.
b. Floors above street floor – 100 square feet.
c. Sales Basements – 40 square feet.
d. Basements not used for sales – 100 square feet.

Location of Departments.

19. In view of the absolute necessity of flexibility on the part of retail store managements as to the location of departments, it is proposed that an average occupancy of all floors above the street floor shall be established, and the stairs and other means of egress based upon that average figure.

Emptying Time Limits.

20. Your Committee proposes to adopt the same plan which has been approved for factory buildings, namely, varying the emptying time with the safety of the structure. It is tentatively proposed that the maximum emptying time shall be ten minutes in buildings where there is no horizontal exit, and upon the assumption that thirty persons will pass a given point on stairs per minute. This is one-third less than the figure of forty-five persons per minute past a given point adopted for factory buildings and proposed for school buildings. The reason for this modification lies in the fact that there is no possibility of the same drill control in stores as in factories and schools.

21. When further data is available, your Committee will submit a proposed percentage tabulation covering this question of egress time, similar to what has been done with factory buildings.

Horizontal Exits.

22. When the term "horizontal exit" is used, it is intended to describe egress secured through one or more openings through a fire wall or fire partition, or by virtue of bridges to adjoining buildings, thus giving the occupants of one section adequate access to another section or area.

23. Each floor should be separately considered in so far as horizontal exits are concerned.

24. The number of persons allowed in two or more sections of buildings connected by horizontal exit or exits, conforming to the N. F. P. A. standards, shall not be greater than can be accommodated into the smaller or smallest building or section adjoining, on the basis of an allowance of four square feet of unobstructed floor space for each person.

25. The provision of one standard horizontal exit entitles any area to an increase in occupancy 50% greater than that established by the available means of vertical egress. Two standard horizontal exits entitle the adjoining areas to an increase of 75% and three or more standard horizontal exits, to an increase of 100%.

Stairs.

26. The same standard which applies to factory buildings shall apply to retail stores.

27. Each fire section or area must have at least one stairway.

28. Stairs shall be located so that they are readily visible to customers, particularly in connection with the design of new buildings.

29. In new buildings it is recommended that stairs be so located that they can discharge directly to the outside at the street level.

30. Stairs that must be attractive from an architectural standpoint, leading from the street floor either to the second floor or to the basement, may be cut off respectively in the second story and the basement and not necessarily in the street story.

31. Such cutting off is essential where other stairs are also cut off even if the other stairs have sufficient capacity to take care of the population on the basis of the standard established herein.

Elevators.

32. It is believed that credit will have to be given to elevators because of their importance in retail stores, both from the standpoint of persons naturally using them and from the liberal number which are supplied, generally in proportion to the height of the building.

33. It is suggested that elevators, in accordance with a formula to be developed, may replace the required stairs up to a point not exceeding 25% of the total stair requirements. Open elevator shafts are to be given no credit as a means of egress.

34. It is suggested that the capacity of cages be based on two square feet per person.

Outside Fire Escapes.

35. No credit should be given to such escapes as a means of egress because it is not felt that they would be likely to be used or could be safely used in retail stores, especially of considerable height.

Escalators.

36. Escalators will not be considered as a means of egress, especially as they generally travel upward.

Street Floor Doors.

37. The distance between adjoining groups of street floor doors shall not be greater than 150 feet. The minimum width door opening which shall constitute an acceptable means of egress is five feet.

38. The minimum width of aisle leading to exterior doors shall be five feet.

39. Revolving doors may replace swinging doors, but not exceeding one-fifth of the total door capacity required for any particular building.

40. Revolving doors shall be considered to have one-quarter of the egress capacity of swinging doors of equal width.

41. At any egress location the revolving doors shall not exceed the width of swinging doors also provided, adjoining or within twenty feet.

42. The width of revolving doors is considered the width of the two leaves.

Number of Exits.

43. No portion of any building shall be more than 100 feet airline to the nearest exit. Exits shall be as remote from each other as practical.

44. Every floor or important section shall have at least two separate exits, other than elevators.

Occupancy Hazards.

45. Your Committee recommends that retail stores be classified as moderate hazard occupancies, and that in so far as applicable, the requirements in the factory code for such occupancies shall also be applied to the retail store code.

Discussion.

Mr. Williams: During the half dozen years I have had the privilege of attending these conventions, a feature of every meeting has been the report of Walter Forster for the Committee on Safety to Life. You have not always agreed with it, but none of you has found it uninteresting. I therefore feel some embarrassment in attempting to carry out his mandate to appear here today in his unavoidable absence and present the report of the committee.

In general, the committee has tried to apply to retail stores the same sort of study, analysis and treatment that it has previously applied to factory buildings, and, to some extent, to schools. The report which we now have is based on actual surveys of some 30 or 40 retail stores.

Much as the committee disliked to make the change indicated in paragraph 7, it seemed necessary to recognize that there are a large number of retail stores now in existence and others being built that run considerably over 12 stories. You will also note that for existing as well as new buildings there is a definite limitation of the number of stories permitted, floor areas, condition of construction and stair enclosure. In column four of the tabulation down toward the bottom, even a building of fire resistive construction, with sprinkler protection, is limited to 4 stories, with open stairways. That requirement, if actually put into law, would mean some pretty serious thinking for the owners of a lot of our large retail stores in the large cities, because there are a great number of such stores of fire resistive construction, many with sprinkler systems, that have open stairways, and the final application of this report would mean the enclosure of a lot of those stairways in buildings of the highest type of construction. That is another thing to be considered.

In some of those buildings, also, where the areas are in excess of the areas provided in this tabulation, dividing walls would be called for, not necessarily the type of fire wall that we have just been debating about, but some sort of dividing partition, at least, would be required to be put into a lot of existing big high-grade department stores; and likewise the light wells, the vertical openings other than stairways, in a good many cases would have to be protected, because, as you will see, a limit of height is established for buildings that have the stairways enclosed, but that have other vertical openings not protected. I just mention some of these salient points that there may be disagreement about.

Then, after establishing tentatively this tabulation of height and area, the next question is the matter of the number of occupants to be permitted in proportion to given exit facilities. The idea of the committee is to apply here the same sort of general treatment that was applied in factories, namely, to limit the number of occupants in proportion to the stair widths for the various conditions of height, construction, etc.; but here we ran up against one thing in which these buildings are different from factories, that is, that we cannot control the number of occupants. The committee has not fooled itself by thinking or trying to make you think that we can set a limit of ten thousand people as the allowable population of a given department store and base the exits on that figure, and have any hope that the owner or the fire department or anybody else will be able to limit the actual population of that store to ten thousand. The population of a store is the number of people that want to get in and can get in during the Christmas rush; that is the only limit there is; therefore your Committee proceeded on that basis.

The figures given in paragraph 18 per person are of course entirely tentative; they may be wrong; it may be that the further surveys we expect to have of buildings during the Christmas rush will show that those figures ought to be modified. The Committee will be very grateful for any information that will throw light on that question.

If we establish, then, some means of calculating the population of the building, we can apply a rule similar to that for factories and determine the width of stairs required. To do that we first have to assume an emptying time for the building. You will remember that for factories we assume that buildings of certain construction could safely be given an emptying time of five minutes; that other buildings would have to be emptied in four minutes, buildings of poorer construction, and still others in three minutes, and the rest was mathematical calculation of the number of stairs required to get the people out. The committee has not ventured yet to set any definite emptying time for a retail store, but the tentative figure given here is thrown out as a suggestion that ten minutes should be the maximum emptying time for a retail store of the highest type of construction without horizontal exits, and we should be glad to have discussion of that,– of what should be the maximum emptying time permitted in a building with horizontal exits, and without horizontal exits. We have also suggested in this report a credit for horizontal exits similar to that in the factory report, and on that also we shall be glad to have discussion as to whether the credit for horizontal exits is reasonable or not, and likewise the credit suggested for elevators. The committee felt that, whereas, in factory buildings, if my memory is correct, we did not give any credit for elevators as a means of exit in a retail store, where elevators are used so largely, as a means of exit in a retail store, where elevators are used so largely, it would be rather absurd to overlook them, because we know from fires that have occurred in retail stores that the elevators do serve as a very valuable means of egress. It was therefore the committee's thought to work out a sort of formula by which we could translate elevator capacity into terms of equivalent stair capacity, with the provision that the elevators should never be permitted to replace more than, say, 25% of the stairways. Mr. Forster tells me that in the later meetings of the committee in which they tried to arrive at this formula, it seemed unlikely that the credit given for elevators would ever be anywhere near 25%, that it probably would not be over 10%.

Now Mr. Chairman, without trying to go into the details of the report further, I will leave it thus in your hands with the suggestion that the committee invites discussion particularly on three or four points, the first of which possibly is the table of limits of height and area, which would mean a lot of enclosing of stairways in existing fire resistive buildings over four stories high.

The President: Are there any comments for the benefit of the committee on this table?

Mr. Rudolph P. Miller (Superintendent of Buildings, Manhattan): If the committee wants something affirmative, that is, something simply to endorse their position, I would like to say that we cannot enclose stairways too much, even in existing buildings. I do not think it is at all unreasonable to require the enclosure of existing stairways. It is on the stairways that the people are dependent for safe egress, and those places must be made places of safe refuge for them to pass out. Even in four story buildings and under, I should like to see the staircase enclosed. If the committee wants any endorsement of that, I would like to give it to them.

Mr. John A. Ferguson (Secretary, Building Code Committee, Pittsburgh): I can also add my endorsement to that same position. In department stores there is one subject that interests me, too; that is the proper enclosure of escalators to prevent the quick spread of fire from floor to floor. In the work I have been doing in the preparation of the Pittsburgh Building Code, the reports recommend that the committee require a wired glass cage over the top of escalators, with sprinkler heads, and automatic doors to close them up in case fire should spread from floor to floor. There is another item that should be discussed pretty carefully, and that is how much glass should be permitted in doorways in the exit stairways in the department stores; some department stores desire to use a great deal of glass so that people will find the stairways easily. Others are afraid that the sight of the fire on the other side of the glass will scare the excited persons and cause a panic. My own belief is that they should be protected completely from the fire and that very little glass should be used.

Mr. Williams: The first question relating to escalators is covered in the present tabulation in this way; if you will take column 3 and start at the top, you will see that there are three classes recognized with regard to protection of the vertical openings: first, buildings having open stairs; second, buildings having stairs enclosed or protected; and third, buildings having all vertical openings protected. Taking the first group, you will see that buildings with open stairs are limited to two stories; buildings having stairs enclosed or protected, but with possibly other vertical openings not protected, such as escalators and light wells, would be limited to three stories; whereas, if they had all vertical openings protected, they would be limited to four stories.

Mr. Miller: If the elevator is to get any credit as a means of egress, I think the escalator is entitled to it also in case it is constructed as some of our escalators are constructed, to stop by the pressing of a button or to reverse itself on the pulling of a lever or the pressing of a button. If we have that condition, and the escalator can be made as effective a means of egress as the elevator is, I think the committee ought to take that under consideration.

Mr. Hutson: At one point in this report the committee discusses emptying time limits and refers to previous reports. I have remarked at other meetings and I have written to the Chairman that I believe it is fundamentally wrong to assume that a greater number of exits from a building will be equivalent to the protection of vertical openings. They do not go into that here, but they beat around the bush and refer to something else. That is not satisfactory. They should not consider that by putting in more exits than they can take care of they will solve the problem, because the fire is going to spread very rapidly. This idea of partial protection, two areas out of four, protecting the stairs and leaving the elevators open, will not give safety in the building.

Mr. Williams: I confess that I was worried for a minute when after considerable silence, Mr. Miller said that if the committee wanted support, he was glad to extend it. It seemed so unprecedented for this meeting to consider extending support to the Committee on Safety to Life, because it never happened before. But when my friend Hutson gets up and throws the same old monkey wrench into the same old gears, I feel that we are back on the proper basis again. We have fought the good fight for several years for recognizing buildings as they are rather than insisting that they should be as Mr. Hutson and a few others think they ought to be. I am not going to apologize for the committee's stand, because this association has endorsed its stand with respect to factories. This, I think, is recognizing buildings as they are; recognizing that a building that is less safe than another is still reasonably safe if it has fewer people in it; recognizing that one does find little three-story factories and department stores, not in New York but all over the country, and always will; that our low-grade buildings that have four or five people in them at once, or in the Christmas rush maybe seven, still exist and are going to keep on existing. That is the position of the committee. I don't know that we want to go into that any further. If the association wants to reverse its action on the whole proposition, we shall have to start all over again.

It seems to me that is a very valuable suggestion on escalators, that escalators that will operate as a means of egress ought to be so recognized, and I think the committee will be glad to make that amendment.

Mr. Hutson: If you enclose a stairway and it is right next to an open elevator, I do not believe the stairway will be of much value as an exit, yet you make no recognition at all of where the other unprotected openings are. You say if you have enclosed stairways you can do certain things; you may have an open light well right through the other floors; you may have any number of openings; they may be right next to your stairway. I do not think that the committee ought to leave things as wide open as that, and personally I think they should require all vertical openings protected, if it is possible to do it.

Mr. Ferguson: I should think we should be very careful about recognizing escalators as exits unless they run all the way down, because if people were to be carried by the machinery from the fourth floor to the third and find themselves in the midst of the fire and unable to reach the reversing mechanism and get back up again, considerable danger would be encountered.

Prof. Woolson: I am fully in accord with Mr. Miller's position, that all stairways in department stores ought to be enclosed. I do not mean that the whole stairway need be enclosed, but certainly the stairway in one story or the other should be enclosed. If it is necessary to leave a stairway or escalator open for the purpose of allowing the purchasers in the store to look over the goods as they pass from one floor to another (if that is the desire, – the advertising feature,– which I believe is one consideration) there should be a doorway at the top that will stop the rapid draft. As sure as you get a fire started in the usually combustible material on the shelves and hanging in the air in an ordinary department store, (the heat and smoke rolling up into the floors above) you have a panic condition. I do not think that any calculation should be based on as long a period of time as ten minutes for the people to get out of a department store. I do not know that it is practicable to get below that; it ought to be, because a panic condition will exist long before that time, and it does not make any difference what the character of the construction is, you will have a large loss of life if the exits are not ample to allow the people to get out in a shorter time than ten minutes.

Mr. C. Heller (San Francisco): One of the reasons for the committee assigning ten minutes, which was only tentative, was that the principal part of the population, at least 50%, is on the ground floor. How long is it going to take people to walk downstairs when the elevators are not running, from a 16-story department store? That is really the problem. That is why a longer time was permitted. The panic condition prevails entirely on the ground floor.

Prof. Woolson: Does it? If you have thoroughly enclosed stairways and enough of them, so the people can get into the stairways, then the panic condition disappears and the loss of life would be very greatly restricted. To illustrate that, we had a fire in a 30-story building in New York, on the seventh floor, a month or so ago, and with the proper sounding of the alarms, the people on all floors went down the stairways and out of the building inside of 15 minutes, from the 29th floor--there was no one above that. Everybody went down the smokeproof towers out on to the street, and a great majority of them did not know where the fire was. That was at the Bush Terminal Building on 42nd Street.

Mr. John F. Ancona (Rochester): May I inquire if it is the intention of the committee to credit sprinklers only with a modification as to stairway enclosures?

Mr. Williams: The committee intended to follow the practice it followed in the factory code and give credit also in the number of occupants. This table does not take up at all, as yet, the number of occupants. This is only half of the report, and I assume that was clear (which possibly was not clear to all) when I was speaking of Mr. Hutson's comments on the enclosure of vertical openings. The committee will penalize very heavily the store with unprotected vertical openings, in determining the number of occupants permitted. The committee had in mind throughout to permit unprotected vertical openings only where there is a very small number of occupants, and conversely, where sprinkler protection is provided, the number of occupants may be increased, and, in addition, an increase to the height and area may be permitted.

Mr. Ancona: That was my idea, too. You spoke of enclosure of vertical openings, and the installation of sprinkler protection, as being features that ought to permit greater occupancy.

Mr. Williams: There is no question about that, and I trust you also realize that this suggested limit of ten minutes for egress was only for the highest type of building and with all vertical openings, including the stairways, enclosed. It may be too high even for that type, but the procedure the committee has followed has been to fix an emptying time for the very best type of building with all possible protection, and having established that, to work down and establish emptying times for poorer buildings. Did you mean, Prof. Woolson, that ten minutes was too high even for the best type of building? You have just described a safe 15-minute exit from the Bush Terminal?

Prof. Woolson: I do not know that it is, if the stairways are all enclosed and the people are all inside.

Mr. Williams: That is the idea.

Mr. Hutson: Mr. Williams said in his opening speech on this subject that it must be recognized that we could not limit the number of people in a building, particularly a department store; and now he says where we have open stairways and elevators he does limit the number of people. He won't limit the number of people at all; he will just say, "Put in more stairways." That would remind me, as I wrote Mr. Forster, of a condition in an epidemic of smallpox where one might say, "We won't compel you to clean up so that you won't have smallpox; we will hire more doctors and more nurses and let you all have it. We don't care; we will hire enough doctors to cover it." We don't care what this building is or how many holes it has got in it; we are going to put on more fire escapes; that is all a fire escape is– a nurse.

Mr. Williams: We are not putting on fire escapes.

Mr. Hutson: I am using the term as meaning facilities for exit. There was a case in New Haven, practically a fireproof building; a good many of the stairways were enclosed, but there was one little vertical opening, and I know that they pulled one dead man out of that building and I believe two or three others. It was an office building. It was in a city that had a good fire department, but the fire department could not be quick enough. There is no fire department and there are no exit facilities that can take care of the spread of fire vertically.

Mr. Miller: I would like to ask the committee to consider paragraphs 9 and 11 under Required Horizontal Exits. In the one, they fix a certain number of square feet for 15 stories in height which differs from the requirement in the other. Of course, I recognize the fact that we must do the best with existing conditions that we can, but in doing so I think we should not place a premium on the existing building, and I think the difference in those two sections does that very thing. I would like to suggest to the committee that they consider whether it would not be wise to fix those areas and make them the same for both the existing and the new buildings?

Mr. Ancona: I think the error is in the last clause of paragraph 8, which says that buildings over ten stories in height must have at least one fire wall affording horizontal exit from the second to the top story. (Laughter.)

Mr. Williams: The English may be rotten – (laughter) – but the meaning, of course, is that the wall extends from at least the second to the top story and affords horizontal exits in each story from one side of it to the other. We humbly beg the pardon of the Committee on Nomenclature for using the term fire wall in a case where the wall does not extend through the first story!

Mr. Ancona: In that connection I would like to suggest that some limitation be placed on the area of the building. Suppose you had a 12-story building 40 by 40 feet; should the fire wall be required in that extremely small area?

Mr. Williams: Do you think that is a practical condition we need to meet?

Mr. Ancona: Well, I do not know; it was suggested to me by a certain condition that actually came up in my own work not long ago.

Mr. Williams: We have that sort of tower for office use; I do not know that we ever happened to see one used for a retail store.

Mr. Miller: I see under paragraph 14 the committee intends to throw the mezzanine to the floor below or consider it a part of that floor area. I think in doing that they should place some limitation on the mezzanine. I do not know whether I saw it in this report, but I have an impression that the mezzanine has been defined as a floor area that is not quite as large as the floor area immediately below it. If that is a definition, then, as we have a great many buildings in New York where the upper floors are set back, those upper floors would all be mezzanines. I think there ought to be some restriction, and I leave it for the consideration of the committee as to what is to be understood by mezzanine.

Mr. Williams: I have already explained that we should be glad to have discussion on Area Calculations if there is any difference of opinion as to this basis of computing population in terms of area, remembering, as I said, that these figures are very tentative.

Mr. Heller: There is considerable confusion as to what a horizontal exit is; whether it is a wall or a fire partition. As to the openings, there is no assurance that if a fire wall or a fire partition is built, that there will be a sufficient number of doors to permit the population on either side to pass through within a proper time.

Mr. Williams: That is one of the general requirements we threshed out in the factory code and we have not repeated all the details here; when we speak of a door or a stairway, it is understood that that door and that stairway are going to be of the standard construction worked out previously, and that there will be a sufficient number of doors in fire partitions to serve the number of people that are there. The main question is here; assuming that we have a fire wall or partition with a sufficient number of exits in it and of sufficient width to accommodate the people, are we justified in increasing the allowable occupancy in proportion to the stairways, by 50%, 75% and 100% respectively, or are those percentages too large? I thought possibly we might have some difference of opinion on that.

Mr. W. C. Robinson: Referring to paragraph 34, I would like to ask if the committee has considered possible conflict with state or municipal computing elevator capacities with the rule they have advanced of two square feet per person? Might there not be conflict in that regard?

Mr. Williams: We thought that that rule was rather in line with the usual requirement. If there are any other requirements that you would suggest, we would be glad to know of them. Elevators are usually figured at 75 pounds per square foot, which means half of one person per square foot.

Mr. Robinson: I just wanted to know if that had been discussed. I have nothing to advance at this time.

Mr. Miller: I would like to ask the committee to reconsider sections 39 and 40. Under section 39, as I understand it, we can replace one-fourth or one-fifth of the ordinary door openings with revolving doors; then, in the next section, we say that a revolving door is only equal to one quarter of a swinging door of the same width. That will allow one, by putting in the revolving doors, to materially decrease the exit capacity of the building.

Mr. Williams: My understanding is this, that if we require 50 feet of doors, one-fifth of those doors, namely, ten feet, may be replaced by revolving doors, but these must have four times the width of the swinging doors that they replace, or 40 feet.

Mr. Miller: If that is made clear, I think it is all right.

Mr. Waite: Was it the intention that these revolving doors should be non-automatic in action?

Mr. Williams: I shall have to admit that I do not remember just how we handled that in the factory rules; it is about the same thing here.

Mr. Miller: I think it makes no difference whether the doors have rigid braces or easily releasing braces; the fact of the matter is that if they are readily released, the wind will blow them open. If the releasing devices are so set that any ordinary person can release the doors, separate the leaves, a high wind will open them and release them, with the result that the manager or superintendent of the building will always set them up so tight that they might just as well be rigid braces, so I think we might as well say nothing about it.

Mr. Waite: Aren't you talking about the collapsible door?

Mr. Miller: Yes.

Mr. Waite: I am talking about the revolving door that is operated by electricity and continues to revolve at a given rate of speed.

Mr. Williams: What is your suggestion about that door?

Mr. Waite: Only that its speed is retarded and it is a question whether, in a time of panic, a number of people could get out, get through that door, as quickly as if they were going through by their own momentum.

Mr. Williams: Would you consider a door of that type not worth a quarter as much as the swinging doors?

Mr. Waite: Mr. Boone tells me they are not permitted in New York.

Mr. Williams: Would you say that four doors of that type were worth as much as one swinging door of the same width?

Mr. Waite: I do not know.

Mr. Miller: I rather think electrical operation at a given rate of speed is an advantage to the door, because if we do not have that and people are rushing through, one runs through a little faster than the other and is likely to jam the door; whereas the regular rate of speed is ample to let them out as rapidly as they ought to go out so they won't conflict with one another.

Mr. J. W. Just (Columbus O.): In the case of the revolving door, mechanically operated, is not paragraph 42 in error? There is only one side of the door they can go out.

Mr. Williams: That is entirely a matter of computation. If we consider that the width of the door is equal to the width of the two leaves and then apply a factor of safety of four, as in paragraph 40, we will have left a factor of safety of two with respect to the one leaf that is useful. It is just a matter of the most convenient way of calculating the thing. If there is no further discussion, I should like to move the acceptance of this report as a progress report on the subject covered.

The motion was adopted.

The President: We shall now have an address with lantern slides by our Pacific Coast member, Mr. Jay W. Stevens, entitled "Intensive Work in Fire Prevention."

A review of the Committee's proposal for egress provisions for retail stores, in particular department stores, indicates that the proposed provisions in 1920 are remarkably similar to those included in the most recent editions of the Life Safety Code.

While the design occupant load factors suggested in the Committee's 1920 report may differ from those being currently utilized in the Life Safety Code, it was recognized that the occupants loads of basement sales levels and the street floor would exceed the occupant loads of the sales floors above. Further, the need for floor opening enclosures was recognized and discussed at length at the Annual Meeting.

Perhaps the most interesting point made in the Committee's 1920 Report was the need for regulations to apply to both new and existing building construction and that the practical implications of developing provisions which are applicable to existing buildings must be considered to make the regulations workable.

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Source: "*Proceedings of the Twenty-fourth Annual* [NFPA] *Meeting*", Chicago, Illinois, 1920.