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FIRE PROTECTION HISTORY-PART 242: 1919 (GRADE "B" OFFICE 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 discussed at this meeting were the requirements for "Grade B" office buildings. The following is a transcript of the report on "Grade B" office buildings:

"***SPECIFICATIONS FOR CONSTRUCTION OF AN OFFICE BUILDING, GRADE "B."***

Definitions: An Office Building is one which is used for executive or clerical purposes, except for living rooms for the janitor, and is not used, above the grade floor, for the storage or exhibition for sale of merchandise, nor in any part for manufacturing purposes.

A Grade "B" Office Building is one wherein the Use, Height, Areas, and Exits and Construction of the supporting members fulfill the Grade "A" requirements, but in which certain other structural modifications are permitted.

***Height:** The height from grade to roof line shall not exceed 125 feet, nor exceed a height of two and one-half times the width of the widest street upon which it is located.*

***Area:** The area within enclosure or fire walls of a building not exceeding 70 feet in height shall not exceed the following:*

Fronting on	*Without Sprinklers*	*With Sprinklers Increase of 66[-]2/3%*
One street	*10,000 sq. ft.*	*16,666 sq ft.*
Two streets	*12,000 sq. ft.*	*20,000 sq. ft.*
Three or more streets.	*15,000 sq. ft.*	**20,000 sq. ft.*

or, for a building from 70 to 125 feet in height, shall not exceed the following:

Fronting on	*Without Sprinklers*	*With Sprinklers Increase of 50%*
One street	*7,500 sq. ft.*	*11,250 sq. ft.*
Two streets	*10,000 sq. ft.*	*15,000 sq. ft.*
Three or more streets	*12,500 sq. ft.*	*18,750 sq. ft.*

EXITS.

See "General Definitions" in the Consolidated and Revised Reports of the Committee for the years 1913 to 1918 inclusive.

In case of horizontal exits, each of the connected areas shall provide not less than 3 square feet of unobstructed floor space per person.

Every floor shall have at least two separate exits, and whenever any floor area exceeds 10,000 square feet at least one additional exit shall be provided for each 5,000 square feet additional or fraction thereof.

The occupants of every floor above the first shall be provided with exits computed on the basis of at least 22 inches of width for every fourteen persons for stair exits, or 22 inches of width for every fifty persons for horizontal exits. At least one of the exits provided for such floor area shall be a stair exit.

No width of exit stairway or passageway required by these rules shall be reduced at any subsequent point in the direction of exit travel.

Exits shall be remote from each other, and no point of any floor area shall be more than 100 feet distant from an exit. Whenever any building is more than four stories high and has an occupancy greater than twenty-five people above the fourth floor, then each floor area of such building shall be connected either directly to a smokeproof tower or indirectly through a horizontal exit to such smokeproof tower.

GENERAL ASSUMPTIONS.

The building may be constructed to comply with any of the following types:

1. Where all loads are carried on walls.

2. Where there are exterior bearing walls and interior bearing columns.

3. Where all loads are carried on a protected structural skeleton of steel or reinforced concrete.

That the allowable floor loads and wind stresses shall be such as to conform to the best engineering practice.

That the allowable stresses, quality of all materials and workmanship shall conform to the best engineering practice.

That all work, whether fireproofing or construction, shall be installed under the constant supervision of a competent and reliable inspector.

WALLS.

Foundation Walls: *Foundation walls shall be built of hard burned brick or stone laid in cement mortar, or of concrete.**

The construction of buried footings is not considered a part of these specifications.

Exterior, Interior, Party and Fire Walls: *All such walls shall be built of hard burned brick laid with flush joints of cement mortar, or of concrete. This is not intended to prohibit properly raked or recessed joints for architectural effect.*

All party or lot line walls shall extend 3 feet above the roof as a parapet, shall be the full minimum thickness and shall be properly coped.

** Silicious gravel as a coarse aggregate for reinforced concrete or fireproofing should not be used in portions of the building liable to be subjected to fire.*

Walls veneered with brick, stone, or architectural terra-cotta are permitted if properly bonded or tied with non-corrodible metal binders.

Non-bearing exterior walls carried on protected structural members may be of hollow tile if veneered as described above. Veneering may be included in the required thickness of non-bearing walls carried on protected structural members; otherwise veneering is not included in required thickness.

Thickness of Walls: *No brick exterior, party or fire wall shall be less than 12 inches thick.*

Reinforced concrete walls shall be not less than 8 inches thick. No ducts, chases, or flues shall be permitted within the minimum required thickness of a wall.

No brick bearing wall , whether punctured or not, shall be less than 12 inches thick, and shall be increased in thickness where necessary in order that bearing values of brickwork shall not exceed 8 tons per square foot if laid in lime mortar, 12 tons per square foot if laid in lime and cement mortar, or 15 tons per square foot if laid in cement mortar, nor shall the unsupported height of the wall exceed fifteen times the thickness unless adequately reinforced.

There shall be not less than 4 feet of wall between openings in a vertical line, and the minimum distance between adjacent wall openings shall be 20 inches.

Exterior window openings, where fire windows are required, shall not exceed 45 square feet in area, and no single dimension shall exceed 9 feet.

No window openings shall be less than one foot from the ceiling surface, but the wall construction between the window opening and the ceiling may, if desired, be replaced by a fire window in fixed sash and frame.

Openings in fire walls shall not exceed 80 square feet in area. No fire wall shall have more than three openings in any story, and the distance between adjacent o-penings shall be not less than 9 feet.

***Walls Anchored:** All walls shall be securely anchored and bonded at points where they meet. When supported by skeleton structural framework, they shall be properly anchored and bonded thereto.*

PIERS.

Piers shall be built of hard burned brick laid in cement mortar, or of concrete. Bond stones are not permitted.

***Cap-Stones:** If cap-stones are used, they shall be protected against fire by 4 inches of fireproofing.*

If a pier exceeds in height seven times its least dimension, it shall comply with the best practice in column design.

***Columns:** Columns shall be constructed of steel or reinforced concrete.*

Structural steel columns shall be protected by at least 4 inches of brickwork or hard burned hollow tile with the space between the brick or tile and the metal solidly filled with mortar, concrete or masonry; or the columns may be surrounded by substantial steel reinforcement and this envelope solidly filled with concrete and protected on the outside with 2 inches of concrete; or the columns may be provided with such other protection to meet the four-hour fire test as may be determined as satisfactory as the result of the Investigation on Column Protection now in progress at Underwriters Laboratories. The total thickness of concrete protection shall be not less than 3 inches.

If terra-cotta is used, it shall be secured by substantial interior anchors, or by other equivalent method.

In reinforced concrete columns the metal shall be protected from fire by a minimum of 2 inches of concrete. The effective area of such columns shall be taken as the area within the protective coverings. In hooped columns it shall be taken as the area within the hooping. The corners of such columns shall be beveled or rounded. Round columns are strongly recommended, as they resist fire better than angular columns.

All column protection shall make close connection to the floor construction at top and bottom.

No pipes, ducts, or ,wires shall be placed within the area of the required fireproofing of columns or beams.

Plaster shall not be considered a part of any required fireproofing.

FLOOR AND ROOF CONSTRUCTION.

Floor and roof construction shall consist of a series of steel or reinforced concrete beams with interposed arches or slabs or girderless floors of such material and construction as shall meet the requirements of the four-hour fire test. (See note.)

Roof construction over an attic may consist of steel trusses supporting concrete or book tile with suspended ceiling composed of metal lath and Portland cement plaster instead of fireproofing all truss members so as to withstand the requirements of the four-hour fire test, provided that any openings in the ceiling shall be extended through the roof by ducts of material to meet the requirements of the two-hour fire test.

Floor finish, if of wood, shall be laid on sleepers embedded in incombustible material, or on incombustible material without air space.

Roof Structures and Coverings: *All structures above the roof shall meet the requirements of the three-hour fire test.*

Roof coverings shall be of Class A roofing, as classified by the Underwriters' Laboratories.

STAIR, ELEVATOR AND OTHER SHAFTS.

Stair, elevator, and other shafts shall be enclosed in accordance with the following specifications:

Walls of stair, elevator, and other shafts shall meet the requirements of the three-hour fire test. When the walls of shafts are self-supporting, they shall be built of hard burned brick laid in cement mortar; or of concrete, having a thickness of not less than 8 inches.

All such shafts shall extend at least 6 inches above the roof.

Elevator doors shall be provided with interlocking device so that door can be operated only when car is at landing, and car cannot move until door is closed.

The lobby leading to elevators shall be separated from other parts of building by a partition and fire doors meeting the requirements of the two-hour fire test.

Note.–Wherever "fire test" is mentioned, it shall refer to the Standard Test Requirements for Fire-resistive Construction.

STAIRWAYS AND SMOKE-PROOF TOWERS.

Stairways: *All stairs, landings, and openings thereto shall have an unobstructed width throughout of at least 44 inches, except that handrails may project not more than 3*[-]*½ inches into such width on each side.*

There shall be not more than 12 feet vertically between landings.

All stair landings shall be large enough to permit opening of the doors without interfering with traffic within the enclosure.

Suitable hand rails or banisters shall be provided on each side of each flight of stairs.

The treads and risers shall be uniform throughout and the treads constructed and maintained in a manner to prevent persons from slipping thereon.

No winders shall be allowed.

All stairways shall extend to the street level and open on the street or to an unobstructed passageway affording safe egress to the street.

All exit stairs which extend to the top floor shall continue to the roof.

Stairways which may be used as a means of exit shall not extend continuously to floors below the street level, unless partitioned off in such manner as will clearly indicate the street level, and unless the direction of egress to the street be plainly marked thereon.

***Smoke-Proof Towers:** Smokeproof towers shall not communicate directly with the building on any floor.*

Entrance to these enclosures from floors above the street level shall be either from external balconies or through vestibules entirely open to the outer air, and from floors below the street level through ventilated covered areaways or vestibules.

Balconies shall be of substantial incombustible construction, with solid floors properly drained. The sides of open-air stairs and balconies shall be protected by sheet-metal or other suitable solid material to a height of not less than 3 feet 6 inches.

One smokeproof tower may serve two buildings if the size of the enclosure and capacity of the stairway is adequate for the number of occupants to be accommodated.

***Doors:** All exit doors shall be arranged to open in the direction of traffic toward the outside of building. The doors shall be equipped with approved hardware that can be operated in the direction of exit without the use of keys.*

The doors of smokeproof towers shall have a panel of wired glass, not more than one-third the area of the doorway. All exits shall be properly and clearly marked both day and night.

***Lighting:** All stairway enclosures, smokeproof towers and passageways leading to the street shall be lighted by either gas or electricity. If by electricity the current shall be obtained either from a source outside the building or directly by independent circuit from the main switchboard in engine room. If by gas, the piping shall lead directly from the meter to stairways without branches.*

Vents and Skylights: *A vent shall be provided over each stairway or elevator shaft equal in area to at least three-quarters of the horizontal area of the shaft, and be protected with approved incombustible skylights or side windows.*

Vent shafts shall be protected at the top by approved ventilating skylights or louvres.

All other openings in roof or roof structures shall be provided with approved skylights, doors or windows.

ROOM AND HALL PARTITIONS.

Partitions, if any, subdividing allowable areas shall be incombustible.

Doors and windows in such partitions may have wood frames and sash.

Trim may be of wood.

PROTECTION OF EXTERIOR WALL OPENINGS.

All exterior window openings exposed to buildings within 25 feet shall be protected by approved fire windows, or such other protection as may be approved for the purpose.

Other windows may be of wood.

Exterior door openings exposed to buildings within 25 feet shall be protected by approved fire doors; other exterior doors may be of wood.

PROTECTION OF INTERIOR WALL OPENINGS.

All openings in fire walls shall be equipped with approved automatic fire doors on each side of the wall.

If an opening in a fire wall is made to serve as an emergency exit, it shall not exceed 48 square feet in area, and a self-dosing fire door shall be substituted for one of the automatic fire doors.

Interior openings to ventilating shafts shall be protected by approved automatic trap doors or shutters.

Openings in stair, elevator and other shaft enclosures shall be protected by approved self-closing fire doors.

All fire doors shall be mounted with approved hardware, and shall be securely attached to the wall or partition or to approved frames anchored thereto.

Interior windows in stair or elevator shafts are prohibited.

If chutes are provided, they shall be protected in the same manner as elevator shafts.

SERVICE EQUIPMENT.

The room or rooms in which boilers and all power and operating machinery are located shall be separated from other portions of the building by an 8-inch wall, having an approved fire door at each opening, and such rooms shall not have direct communication with the floor above.

A standpipe shall be installed at each stair tower.

The installation of standpipe and hose shall conform to the requirements of the standards established by the National Fire Protection Association.

Where any portion of the building on the grade floor, or any floor below grade; is used for the storage or exhibition for sale of merchandise, an approved automatic sprinkler equipment shall be provided in such portion.

All electrical equipment shall be installed in accordance with the requirements of the National Electrical Code.

All heating, ventilating and other service equipment shall be separated from other portion of the building by enclosing walls meeting the requirements of the three-hour fire test, and all openings in same shall be provided with approved fire doors.

Where the heating is by blower or indirect systems, the ducts shall be substantially constructed and supported and shall be insulated with satisfactory incombustible covering not less than 1/2-thick. The ducts shall be provided with approved automatic cut-off devices, and in other respects shall comply with the "Regulations for Blower Systems" recommended by the National Fire Protection Association.

Where gas is used for heating or lighting purposes, metal pipes shall be used throughout with properly located valves. Any material of an inflammable nature shall be protected from the flame or heat of the gas lighting, heating or ventilating apparatus by metal and asbestos, or other fire-resistive, non-conducting material. Where gas is used, approved outside cut-off devices shall be provided. No swinging gas fixtures shall be used.

Prof. Woolson: *The Committee would like to get action upon the suggested changes in the previous reports.*

Mr. Doull: *I would suggest in the paragraph "Lighting" that "meter" be changed to "meter outlet."*

Prof. Woolson: *That is acceptable.*

Mr. Doull: *Also in the last paragraph of the report, beginning, "Where gas is used," I suggest that the word "used" be changed to "supplied" in the first and fifth lines. In many cases in office buildings gas pipes are put in and charged with gas, but the gas is never used.*

Prof. Woolson: *The Committee is perfectly willing to do that.*

Mr. Hutson: *As I understand it, in making these suggested amendments to the Grade "A" Building we are making the definition of a fire wall a specification. I would like to ask Mr. Woolson whether it may not be a very great hardship in building a Grade "A" building to have the fire walls extend through from the foundation up?*

Prof. Woolson: *I have already so expressed myself, yes, sir; I think it might be.*

Mr. Hutson: *In this report, then, we will either have to eliminate the word "fire wall" or use some other term.*

Prof. Woolson: *The Committee on Nomenclature has been asked to make a definition covering walls which are offset, not including such walls under the term "Fire Wall." Presumably we will have to make the change here to conform to that ruling, because it precedes the presentation of this report.*

Mr. Hutson: *I move that we put into this report the definition of fire wall as it originally appears in the report of the Committee on Nomenclature.*

Prof. Woolson: *It might be covered by a note saying that for those classes of fire walls, "A" and "B," an offset could be permitted.*

The President: *If such a motion prevailed the Association would reverse what it has just done; that is, the fire wall would be defined under some other–*

Mr. Hexamer: *As an underwriter I will say that a fire wall is supposed to be a wall extending from the ground to the roof, and through the roof, if ncessary, dividing the building into sections. A fire sub-division or partition cannot be so defined; a fire wall is a wall and not a partition.*

Prof. Woolson: *I can see Mr. Hexamer's position, but it does lead a committee into all sorts of trouble to try to write a specification of that kind. Our Committee will probably be writing specifications for fire walls in buildings where they must be continuous all the way up if we have combustible construction in our charge in other reports. We will also have to refer to fire walls or divisions which may have offsets. It is an entirely different proposition if we must use in one sense a fire wall and in another a fire division wall.*

Mr. G. F. W. Price (Toronto): *Does the latter not immediately become a fire partition?*

Prof. Woolson: *Not necessarily. A fire partition might be a fire wall, or it might have only a minimum fire resistance which would simply restrict temporarily the spread of fire; it would not comply with the full definition of a fire wall, which is supposed to hold a fire until a whole section of the building is burned.*

Mr. Quackenboss: *It occurs to me that perhaps Mr. Hutson's point has not been altogether appreciated. It seems that the Committee on Nomenclature is automatically writing specifications; when we accept that Committee's definition of a fire wall as a specification the work of the Committee on Fire-resistive Construction is cut to pieces by the work of another committee.*

The Secretary: *That is the penalty for confusing a definition with a specification.*

The President: *There is no motion before the house.*

Mr. Hutson: *I made a motion that the definition of fire wall in the report now under consideration be worded as the definition originally read in the report of the Committee on Nomenclature.*

Motion seconded.

Mr. Hull: *As a matter of principle it is not a good plan to accept one definition from the Committee on Nomenclature and another definition of the same thing in another committee report that is absolutely inconsistent. It seems to me we ought to be able to get through our heads what the thing is, and then stick to an accepted definition.*

Mr. Frank H. Jones (Illinois Inspection Bureau): *I may be wrong in this thought, but it seems to me we are not getting this definition up wholly for engineers or architects; we should have a definition a layman can understand. In some branches of our work we are dealing with laymen; and if a term for a fire wall covers an offset in one building and not in another, it is hard to explain it to the layman or to an ordinary person. It ought to be definitely settled what a fire wall is, and if there is an offset it should have some other name.*

Prof. Woolson: *In answering that thought I will say this: if you take a thoroughly fire-resistive building and put in an offset wall, I think it is a safe bet, a hundred to one shot, that everybody that has anything to do with that building will call those fire walls; he won't call them anything else; he will know they are fire walls; you cannot get away from this.*

Mr. Hexamer: *I take exception to that again, from an underwriter's viewpoint; we will never grade a building of that kind as two separate buildings. It is a single building, sub-divided, and the chairman will know that the building code specifies the thickness of fire walls, their height, and that they be super-imposed walls. The division of a fire-resistive building by partitions is provided for, but those partitions are not called walls. A fire wall separates buildings into two buildings.*

Prof. Woolson: *May I ask the speaker if a fire-resistive building, with floors that will afford four hours' fire protection and walls offset two or three feet (a fire wall thoroughly built in all other respects), if that would not be recognized; if there would be a penalty imposed because of that not being a standard wall?*

Mr. Hexamer: *I would consider it a sub-divided building, rated as one building, not two separate risks.*

Prof. Woolson: *Does such a wall not lower the fire hazard of the building?*

Mr. Hexamer: *No, it does not; if there are openings in that wall, connected by fire doors, it is a single building, and so rated. A fire wall divides a building into two separate buildings.*

Prof. Woolson: *If there is a penalty for such construction I should say there should be something done with the rating system.*

Mr. Caldwell: *In New England we do recognize an offset wall as a fire wall; we have one notable example in the Institute of Technology building in Boston, where a large portion of the sub-dividing walls are offset, and yet these are recognized as independent fire sections.*

Mr. Hexamer: *Separately rated?*

Mr. Caldwell: *That particular risk is not separately rated in those sections, but the walls are considered fire walls.*

Prof. Woolson: *It is not a question of rating; it is a question of whether we shall regard the two sections as properly protected from fire in each other. There are some other considerations besides rating.*

Mr. C. W. Hejda (Chicago): *I would like to present the municipal side of this matter; that is, the enforcement of the ordinances of the various municipalities. In Chicago we found that we absolutely had to consider a "fire wall" only a wall continuous from the foundation up to three feet above the roof, because all the building ordinances, all the fire prevention ordinances bearing on the areas of buildings and the separation of buildings (whether a building shall be considered as one or more) depend on just that interpretation of a fire wall. The Courts have based decisions on that very point. If there had been an offset in the walls under legal consideration I can readily see where we would have been in hot water.*

The President: *This proposition for an offset in fire walls is only approved where the building complies in every respect with the specifications for a standard fire-resistive building. In all probability the buildings involved in the cases you point out would not be 100 per cent standard, and if so, this would not apply.*

Mr. Hejda: *Suppose under our ordinances a question came up in Court as to what the area of a building was, that is, a building divided into two or more sections by an offset wall?*

Prof. Woolson: *Well, if it were not 100 per cent standard under our specifications for fire-resistive buildings then the wall should be super-imposed.*

Mr. Hejda: *If we had offered the definition of a fire wall that is accepted by your committee the Courts might have had difficulty in distinguishing between the two types of wall. We found that we had to follow the clear single definition; otherwise we would have lost out.*

Prof. Woolson: *It would not be the first time the Courts have had to be educated.*

Mr. Miller: *This meeting has decided that a fire wall shall be a wall continuous from the foundation through the roof; what is the use of discussing it now one way or the other?*

Prof. Woolson: *We have got to adapt ourselves to it.*

Mr. Small: *Following Mr. Miller's thought, I move that the report be referred back to the Committee, with power to amend the text in this respect.*

Mr. Miller: *Mr. Small's motion would dispose of this report?*

The President: *No, only this one item.*

Prof. Woolson: *That the question of fire walls be referred back to the Committee.*

The President: *The report as a whole is not before us; the Chairman was interrupted in pointing out some changes in the first section. Mr. Hutson's motion is before the house. I would like to ask Mr. Small if he intends his motion as a substitute?*

Mr. Small: *I do not know what Mr. Hutson's motion was.*

The President: *Mr. Hutson's motion was that the definition for fire wall as originally presented in the Nomenclature Committee report be inserted here. The Chair would be disposed to rule that to ask the Association to vote on that would occasion a request that it reconsider its vote taken a few minutes ago on the report of the previous committee.*

Mr. Lacount: *There is no other way of getting around that. If we wish to reconsider that, a motion should be made to reconsider it. Mr. Hutson's motion, with all due deference, is clearly out of order. I make this statement to clarify the atmosphere, because we are wasting a lot of time.*

The President: *The Chair would rule that the motion is out of order.*

Mr. Small: *I move that the question of fire wall terminology in this report be referred back to the Committee, with authority to straighten out its conflict with the definition of fire wall just adopted.*

The motion was adopted.

Prof. Woolson: *Concerning the note at the end of the first section of this report, in the light of extensive investigations made by the Bureau of Standards, which have proved that gravel is unreliable as an aggregate in concrete subjected to fire, it is suggested that the note indicated should be inserted, not only in this report, but in past reports.*

The President: *If there is no objection, we will consider the first section of the report, covering suggested amendments to previous reports, approved except for the item on the definition of fire walls referred back to the committee.*

Mr. Norman G. Hough (Lime Association): *I should like to ask the Chairman if there is a definition of cement mortar, or whether by cement mortar being specified, a contractor is compelled to use a straight cement mortar and not use any lime? It is common practice to use a percertage of lime.*

Prof. Woolson: *Cement Mortar is specified in former reports as follows: (Reads)*

> *Cement Mortar.– A mortar made of cement and sand in the proportions of one part cement to not more than three parts sand by volume. Not more than 15 per cent of the cement by volume may be replaced by an equal volume of dry hydrated lime.*

Prof. Woolson: *We should like this matter considered. The name of this Committee originally was Committee on Fireproof Construction, including Reinforced Concrete, and in 1913, at the request of the Committee, it was changed to Committee on Fire-resistive Construction; The Committee has had several requests to draft specifications for buildings of joisted brick construction, has taken the matter under serious consideration, and has decided unanimously that under the scope of its activities, as defined by its present name, it is entitled to draft specifications for joisted brick buildings. Under a strict interpretation of the term Fire-resistive Construction, the Committee considers that none of the bearing members of a building should be of combustible material; but in view of the fact that probably 80 per cent. of the buildings in cities are of the joisted brick type, and in the majority of those buildings the fire-resistive construction, or features of construction for resisting the spread of fire are very deficient, it seems highly desirable that specifications for the proper protection of that class of construction should be drafted. The Committee feels that with its seven years of experience in this work and the material it has collected bearing upon the subject, it could properly undertake that work and would be pleased to do so, but feels that its name should be changed to Committee on Construction of Buildings, or something of that sort. Unless there are objections the Committee requests the incoming Executive Committee to allow us to change the name.*

The President: *If there is no objection that matter will go before the Executive Committee as requested. Is that all you wish to comment on, in connection with the report?*

Prof. Woolson: *The report as a whole is before you.*

Mr. Price: *Under the heading of area it might be necessary to make a change in fire walls.*

Prof. Woolson: *That subject will come up. Mr. Small made the motion that we should take into consideration the new interpretation of "fire wall."*

Under the heading of "thickness of walls" we have cut out a rather rigid restriction appearing in the Grade A report in regard to the percentage of wall area that might be used for windows. The Committee felt that was not necessary in a Grade B Building. The sixth paragraph reads "Exterior Window Openings where fire windows are required, shall not exceed 45 square feet in area." That phrase "where fire windows are required" is new. Under "Floor and Roof Construction," the specification for roofing is changed somewhat. In this case we allow steel trusses supporting concrete or book tile with suspended ceiling composed of metal lath and Portland cement plaster instead of fire-proofing all truss members so as to withstand the requirements of the four hour fire test. In other words, if you form a closed attic, then any openings in it must be continuous, and walled in, forming a partition.

Mr. Small: *I desire merely to have the record show that I called attention to the discussion of a year ago, when this Committee report was presented, and pointed out that this is a specification for what the Committee terms a standard building, and what some of us might wish to call a model building.*

Prof. Woolson: *No, this is not a standard building; the specification for a Standard Building was written in 1913.*

Mr. Small: *I would call attention to the fact that the limiting specifications covering the maximum area of fire windows and the maximum area of door openings are not in conformity with the present and established practices of the Association, and I suggest that the Committee modify these paragraphs, to permit the maximum size of standard window and the maximum size of door to be used if desired.*

Prof. Woolson: *That is entirely acceptable.*

See the paragraph following the one we were just discussing, "Floor Finish." In this class of building we are permitting a wooden door laid on concrete or other fire-resistive material.

Under heading of "doors" appears the word "approved," and later in several paragraphs the word "approved" appears. The Chairman desires to bring to the attention of the Association the use of that word in connection with the definition that was drafted last year as a result of the persuasive eloquence of Mr. Small, of Underwriter's Laboratories. We originally used the word "approved" in a very general sense as meaning a material or device which had been approved by Underwriters' Laboratories. Mr. Small objected, for certain reasons which he explained at that time, and proposed a new definition, which his arguments were strong enough to convince the Association was proper, and we adopted it. Here it is: (Reads.)

*Approved.– The word "approved" applying to devices, systems or materials mentioned herein shall be construed as signifying that the device, material or system has been reviewed by an organization adequately equipped and qualified for experimental tests, inspection of the run of goods at factories and determination of service values through field inspection, whose records are made generally available through promulgation and whose findings are subject to review by the Federal Bureau of Standards.**

I submit that this does not lead us anywhere. The Bureau of Standards does not say it will do anything. Something is referred to the Bureau of Standards; the Bureau says "We will do it if we have the equipment and the money; if we haven't, we will not." I desire to make the suggestion, that following the word "approved" we substitute "approved by the authorities having jurisdiction," for the definition and note now used. In the last analysis, specifications of this kind for construction go back to the building ordinance of a city for authority, and the building laws of a city usually preclude the acceptance of authoritative ruling by any other agents than its own. If we leave it simply "approved," it would mean approved by the city authorities, and in ninety-nine cases out of a hundred we would get what we want any way and avoid much confusion.

***The President:** Is that suggestion of the Chairman agreeable to Mr. Small?*

***Mr. Small:** Yes, sir.*

***The President:** Those in favor of such action will say "Aye," and those opposed "No."*

The motion was adopted.

***Prof. Woolson:** Under Room and Hall Partitions, "Doors and windows in such partitions may have wood frames and sash"; that is, in partitions sub-dividing allowable areas, or areas in which no partitions might be required, the partition construction called for is incombustible, but the doors and windows may be of wood; in other words, an office story may be sub-divided by temporary partitions with glass in the upper portion.*

Mr. Wharton Clay.(Associated Metal Lath Manufacturers): *I move that the Committee be instructed to reconsider this paragraph so that any type of partition permitted in Class A will be permitted in Class B, the reason for that being that there may develop partitions not wholly incombustible in themselves, yet which may be a barrier to fire for longer than the one hour period, which is required in Class A buildings. It is customary in a building ordinance to allow for designated partitions any partitions which may be of higher grade. In putting in these room and hall partitions of incombustible material, much fire fodder is permitted in the doors, frames, and trim. My idea is not to eliminate what is noncombustible, but to remove the discrimination against partitions which may be not wholly incombustible in themselves, but which may bar the fire a great deal longer than the partition which is here permitted, which may be a partition which is incombustible in itself, but which may bar a fire only a very few minutes, while the partitions called for in Class A would bar the fire an hour.*

> **The Bureau of Standards has taken no official action on rules relating to fire protection and has not formally adopted a definition of the word " approved" as relating thereto. The Bureau reserves the right to limit its activities in reviewing appealed cases to those which it can under take with the funds, facilities and equipment available.*

Prof. Woolson: *The point I think the speaker is making is this: and you might just as well know it. The Underwriters' Laboratories has been making a series of tests during the past year, and the indications are, although the report is not yet completed, that a wood stud partition with metal lath and three-quarter inch of plaster on each side, is good for about one hour fire protection, or close to that. If that is the case, we should not bar that partition, perhaps, and I will make the suggestion, Mr. Clay, that the partitions sub-dividing allowable areas, shall be of incombustible material, or shall at least withstand a one hour fire test. If the partition which I assume you are referring to, meets the one hour fire test, eventually it will come in under this wording; is that satisfactory?*

Mr. Clay: *Entirely.*

Prof. Woolson: *Under the heading Protection of Exterior Wall Openings, in the second paragraph, "Other windows may be of wood," means window sash may be of wood. See also the third paragraph: "Other exterior doors may be of wood." In Grade A buildings all these doors are required to be fire doors, which did not seem necessary in this class of building.*

Mr. Small: *May I suggest with regard to the point raised by Mr. Clay and the Chairman's suggestion for disposing of it; that if he refers to the report of the Committee on Nomenclature just adopted, we have there a definition for a fire partition which perhaps will be all that is necessary. We harmonized this report with the definition of a fire partition; fire partitions are graded by performance tests, the minimum being one hour protection; it you merely call for a fire partition, wouldn't you get away with it?*

Prof. Woolson: *No, because the idea is this: you have a large floor area, which may be sub-divided, as in some buildings, simply by a series of wooden fences separating one office from another, or by short partitions, with glass above, to prevent draft and afford a certain amount of privacy. You can leave that whole area without any partition whatever; it is not necessary that partitions should have a minimum resistance of one hour; we do not care whether the partition has a resistance of any length of time so long as it does not add to the fuel. The idea was to reduce the combustible material in the area; allow light metal frame and glass if you like, which perhaps would not stand ten minutes. I think it would be better to leave it as we had it, unless Mr. Small has some other reason.*

The President: *Does that overcome the point Mr. Small raised?*

Mr. Small: *I am familiar with the construction Prof. Woolson describes as being tested and which may rate as one-hour protection. It seems to me if it does get that rating and is worthy of recognition in this Committee report that any material classified as the result of tests by the Laboratories as one-hour protection should be admitted in this paragraph; therefore it would be proper, and I think reasonable and fully in order, to say that it shall be of incombustible material or of any construction rating as a fire partition.*

Prof. Woolson: *That was exactly my idea. I would not mention any material; I would say any material or construction which would meet at least one-hour fire test.*

The President: *Does it read that way at present?*

Prof. Woolson: *Not at present, but it is the intention to make it so.*

The Committee now presents the report as a whole, with the modifications suggested by the Association, and requests that it be adopted.

The President: *You have heard the motion to adopt the report. Is there any discussion?*

The motion was adopted."

This Committee Report is of particular interest for a number of reasons:

- The maximum building height limitation for buildings of fire resistive construction (with a 4 hour structural frame and floor and roof construction).

- The exit capacity proposed for enclosed stairs (14 occupants per 22 inches of stair width).

- The number of exits required (a minimum of 2 exits for all buildings; one exit for each 5,000 square feet of floor area exceeding 10,000 SF).

- The provision requiring smokeproof enclosures for stairs in building more than 4 stories in height.

- The provision requiring a 2 hour separation between elevator lobbies and other parts of the floor.

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