

FIRE PROTECTION HISTORY-PART 234: 1915 (OCCUPANT LOADS/EXIT CAPACITY)

By Richard Schulte

The nineteenth Annual Meeting of the National Fire Protection Association was held in New York in mid-May in 1915. One of the Committees presenting a report at this meeting was the Committee on Safety to Life. Part of the Safety to Life Committee's Report included a section on the relationship between occupant loads and the capacity of exits. The following is an excerpt of the Committee's Report on the subject of occupant loads and exit capacity:

"Number of Occupants Based on Exit Capacity.

Your Committee on Safety to Life believes that the following brief treatise on number of occupants as determined by exit capacity may prove a timely contribution, and that it may afford a basis for discussion and a source of information for a number of interests, chiefly the authorities upon whom rest the drafting of building codes and factory laws.

It is now being recognized that the number of persons who may occupy a given building should be based on the available exit facilities, and certainly that new buildings should be constructed in conformity with definite schedules of exits required for the proposed number of occupants. It seems rather strange that it is only recently that this point of view has become fairly common. The human contents should be measured to the available exits just as the material and equipment which may be placed in a building are limited by the carrying power of the structure.

It is believed that the first laws treating number of occupants and exits in this manner were embodied in the 1913 Factory Laws of the state of New York. These laws have been given wide publicity and have served as a foundation for other jurisdictions. The comments of your Committee upon these laws are not made in a spirit of criticism. These laws are cited simply to illustrate points where betterment is believed to be possible.

The state of Wisconsin in 1914 issued a building code in which the exit problem has been treated similarly as regards principle, but with sufficient deviation to make an interesting contrast.

The fundamental features of the New York Law are as follows:–

- 1. The width of stairway required for a single file of persons is placed at 18 inches in buildings erected prior to **October, 1913**, and 22 inches in buildings erected subsequent to that date.*
- 2. It is assumed that persons can stand on alternate steps.*
- 3. Under ordinary conditions approximately fourteen persons may be accommodated in each story for every 18 or 22 inches of stair width available.*
- 4. Stairs serving as required means of exit must be enclosed in all new buildings over one story in height, and in existing buildings over four stories in height.*
- 5. Where halls are created by stair enclosures, additional persons per floor are allowed in the ratio of one person for each 5 square feet of such enclosed hall.*
- 6. Where a division wall exists, the number of occupants may be increased to the point where the total number of persons engaged on both sides of the wall, if transferred to the smaller section, will have available not less than 5 square feet each of unobstructed floor space for standing room.*
- 7. For buildings of certain height, outside fire escapes of good construction with window openings protected may serve as an additional stairway.*
- 8. For sprinkler protection, the number of occupants is arbitrarily increased 50 per cent.*

Your Committee now takes up first the subject of horizontal exits and makes certain comments thereon.

This brief article on the relationship between occupants loads and exit capacity lays out the thinking on the design for building exits in 1915.

In 1915, exit stair enclosures were thought of as areas of refuge from fire and combustion products, hence, the statement regarding the number of occupants which can stand within an exit stair enclosure.

Also of note are the statements regarding the enclosure of exit stairs and the increase in capacity granted in buildings protected by a sprinkler system. Although it appears that the increase in exit capacity provided for stairs in buildings protected by a sprinkler system is purely arbitrary, clearly this provision is intended to encourage the installation of sprinkler systems in buildings.

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