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FIRE PROTECTION HISTORY-PART 73: 1942 (BMS92/FIREPROOF CONSTRUCTION)

By Richard Schulte

A report titled "***Building Materials and Structures -Fire-Resistance Classifications of Building Constructions***" developed by the Subcommittee on Fire-Resistance Classifications of the Central Housing Committee on Research, Design and Construction was issued on October 7, 1942. This report, also known as **BMS92**, includes the following excerpts addressing "Fireproof" construction:

> "*That type of construction* [Fireproof construction] *in which the structural elements are of incombustible materials with fire-resistance ratings sufficient to withstand the fire severity resulting from complete combustion of the contents and finish involved in the intended occupancy but not less than the ratings specified in table 1, and for which the roof coverings are as specified hereafter.*"

> "Table 1. – *Minimum fire-resistance ratings of structural elements for type I construction*

Subtype	I-A	I-B	I-C	I-D	I-E	I-F
Weight of combustibles, lb/ft^2 of floor area	Over 35	35	30	20	15	10
Columns, girders, trusses	(a)	4	3	2	1-1/2	1
Floor construction	(a)	4	3	2	1-1/2	1

> "*In general no restrictions as to height have been applied to the Fireproof type of building, except for occupancies deemed specially hazardous. This may be justified on the basis that the building should withstand a fire completely consuming all combustible contents and trim without collapse of structural members, or that for the higher amounts of combustible contents, the fire resistance incorporated in the building, in combination with its fire-extinguishing equipments and the public fire protection, is deemed adequate to prevent such collapse.*"

"*Another reason for the very moderate restrictions on height applied to the Fireproof building is its inherent advantages in point of limiting the spread of fire and smoke, resulting in greater safety to occupants and less difficulty in extinguishing fires. With incombustible floor construction of the required degree of fire resistance and enclosed vertical openings, the fire will be prevented from spreading from floor to floor through interior channels and the travel of smoke will be greatly restricted. For other than the lighter amounts of combustible contents, fire may be communicated from floor to floor through unprotected exterior wall openings, but this can be prevented with moderate fire-fighting effort. The building is relatively safe for entry by fire-fighting forces, and fire fighting equipment can be provided within the building with the outlets and connections so located or protected as to give good assurance of its availability in case of fire.*"

"*These properties of the construction also enable conditions having a bearing on the safety of occupants to be evaluated with a good degree of reliability. While with non-fire resistive construction it is generally considered necessary to provide for exit of all occupants from the building or fire-division thereof within a given time, the greater barrier to spread of fire and smoke offered by the floors and other subdividing constructions in Fireproof buildings make it necessary to provide means for immediate exit only from the area directly involved. This greatly reduces the required capacity of stairs which otherwise would be prohibitive for high buildings.*"

"*Fire severity is used herein as a measure of the intensity and duration of a fire. It is expressed in terms of time of exposure equivalent to that in the standard furnace test as defined in American Standards Association A-2, 1942.*"

"*For buildings generally associated with the lower range in combustible contents, such as residential and office buildings, it does not appear justifiable even from this standpoint to apply an unduly large factor of safety. Where the expected fire severity is in the range* [of] *1/2 to 1*[-]*1/2 hr, a 2-hr requirement for high buildings should give good assurance of stability under fire conditions.*"

BMS92 is of particular interest because this report advances the concept that the fire resistance ratings required for "Fireproof" construction should be based upon the fire load of the building. It should be noted that BMS92 specifically states that a fire resistance rating of 2 hours is more than adequate to assure structural "*stability under fire conditions*" in high rise office and residential buildings.

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