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At the Annual Meeting of the International Conference of Building Officials held in Kansas City, Mo. the week of Sept. 17, a code change was adopted for inclusion in the 1973 edition of the Uniform Building Code. The attached is that which my notes show was adopted. It seems as though there must be some editorial revision but the intent seems quite clear.

John G. Degenkolb

Shaft sizing 2.5X VENT (2.5 X 5.2 = 13 FT<sup>2</sup>)

Top opening 2.5X FLOOR VENT

Floor vent. (Total Per flr) = 1.3 FT<sup>2</sup> / 1000 FT<sup>2</sup> OF OUTSIDE WALL PER FLOOR

∴ 100 X 100 = 4000 FT<sup>2</sup> X 1.3 = 5.2 FT<sup>2</sup>

30 000 X 10' = 300,000 ft<sup>3</sup> / min

EXIST. Mech = 30,000 cfm R.A.

20 chgs/hr = 100,000 cfm - 30,000 = 70,000 cfm !

Max compartment 10000 cfm @ 10' = 100,000 ft<sup>3</sup>  
30 chgs/hr  
60 | 3,000,000  
      50,000 = 50,000 cfm

@ 20 chgs = 60 | 2,000,000  
                  33,000 cfm

Shaft Size = 2.5 X 5.5    13.7 ft<sup>2</sup>

2350 1/17  
14 | 33000  
      28  
      5000  
       42  
       80

SECTION 1807. Special Provisions for High Rise Group H Occupancies and Group F Division 2 Office Buildings.

(a) Scope

These requirements apply to buildings housing Group F Division 2 Occupancies used as offices and to Group H Occupancies.

Such buildings having floors used for human occupancy located more than 75 feet above the grade at the lowest level of Fire Department vehicle access shall conform to the requirements of this Section in addition to other applicable requirements of this Code.

(b) Compartmentation

1. Compartmentation shall be provided in every building to provide areas of refuge for the building occupants. This may be provided by:
  - a. Installation of a horizontal exit dividing a story into two or more areas of approximately the same size not exceeding 30,000 ~~square feet~~ 10,000 square feet or
  - b. Sub-dividing the building into 5 story compartments by interrupting the stairshaft with smoke barriers every 5th floor or through the use of smokeproof enclosures for all stairways or any other method which will protect against the movement of smoke from one compartment to another.
2. Openings in exterior walls located vertically above one another shall be protected by approved flame barriers either extending 30 inches beyond the exterior wall in the plane of the floor or by vertical panels not less than 3 feet in height.
3. When compartmentation is by a horizontal exit, there shall be no openings in the separating wall which would permit transfer of smoke through the wall except for the required exit.

(c) Fire Alarm

A manual fire alarm box shall be located adjacent to exits into stairway shafts and in every elevator lobby. The box shall be connected to the Central Control Station and to the voice communication system as required by Sections 1807 (f) and (g). The system shall be designed in accordance with UBC Standard No. 18-1 (to be based upon applicable provisions of NFPA 71, 72A or 72B)

(d) Fire Detectors

~~An approved system which will provide for automatic detection of products of combustion other than heat shall be installed in every mechanical equipment room and in the return air portion of every air conditioning and~~



Upon detection of smoke or fire the system shall cause the following:

a) activate voice alarm system per Section 1807 (e)

b) cause all return air to be exhausted

c) cause <sup>all</sup> supply fans to deliver 100% outside air

d) open smoke shaft vent at the fire floor.

e) activate <sup>system</sup> for stairway pressurization, when req'd.

f) activate exhaust fan on smoke shaft, when req'd.

DETECTORS SHALL BE AN APPROVED TYPE WITH OPERATING SENSITIVITIES WITHIN THE LIMITS OF UBC STANDARD 43-6 AND SHALL BE CONNECTED TO THE BUILDING FIRE ALARM SYSTEM. -2-

Submit model 40 for approval

<sup>AIR HANDLING</sup> ~~mechanical ventilation system that serves floors other than the floor on which the equipment is located. Detectors set to operate within the limitations of UBC Standard No. 43-6 or for greater sensitivity, shall be located at each opening into the vertical shaft, <sup>RETURN OR EXHAUST AIR</sup> OR DUCT, <sup>RETURN OR EXHAUST AIR</sup> OPEN STACK DETECTION~~  
~~THE SYSTEM SHALL AUTOMATICALLY CAUSE ALL RETURN AIR TO BE EXHAUSTED AND ALL SUPPLY FANS TO DELIVER 100% OUTSIDE AIR.~~

see attached

(e) Voice Alarm System

Both the detection system and the fire alarm system shall activate a voice alarm system capable of being operated from the Central Control Station on both a general and selective basis and dependent upon the compartmentation involved. The alarm shall be designed to be heard by all occupants within the building or designated portions thereof and within elevators. The elevator lobby detector required by Chapter 51 shall be connected to the system.

(f) Voice Communication System

There shall be two separate approved continuously electrically supervised voice communication systems; one for Fire Department communication and the other a public voice communication (address) system between the central control station and the following areas:

1. Elevators, elevator lobbies, corridors and stairways.
2. In every office area exceeding 1,000 square feet in area.
3. In each dwelling unit and hotel guest room. When approved, the fire department system may be combined with the public voice communication system.

(g) Central Control Station

A central control station for Fire Department operations shall be provided in a location approved by the Fire Department. It shall contain the voice communication systems panel; fire detection and alarm system panels; status indicators and controls for elevators and air handling systems; a public telephone and sprinkler valve and water flow detectors and standby power controls.

(h) Smoke Control

Natural or mechanical ventilation for the removal of the products of combustion shall be provided in every story and shall consist of one or more of the following:

1. Panels or windows in the exterior wall which can be opened from an approved location other than the fire floor. Such venting facilities shall be provided at the rate of 20 square feet per 50 lineal feet of exterior wall in each story, whichever is greater, and distributed around the perimeter at not more than 50 foot intervals. Such panels shall be clearly identified as required by the Fire Department.

Degenkolb Note: I think that a line "or at the rate of 3 percent of the floor area, whichever is greater" was inadvertently left out.



~~The~~ Total vent area per floor shall be based on  $1.5 \text{ ft}^2$  per 1000  $\text{ft}^2$  of outside wall area per floor. Shaft size shall be ~~based on~~ ~~a~~  $2\frac{1}{2}$  times the floor vent ~~size~~ <sup>size</sup>.

out - or make part of (H) - Separate!  
(Does tempered glass back up hold?)

2. Tempered glass may be used in lieu of openable panels.

3. When fire sprinklers are installed in compliance with Section 1807(M), the mechanical air handling equipment <sup>MAY</sup> be designed to assist smoke removal. <sup>UPON ACTIVATION OF FIRE ALARMS SYSTEM</sup> Under fire conditions, the return and exhaust air shall be moved directly to the outside without re-circulation to other sections of the building. <sup>THE SUPPLY FANS SHALL PROVIDE 100% OUTSIDE AIR.</sup>

4. A shaft <sup>OR SHAFT</sup> through which smoke and heat can be mechanically vented to the outdoors. The size of the shaft shall be uniform throughout and of such dimensions as to provide <sup>60</sup> air changes per hour <sup>FROM</sup> in the largest compartment served anywhere in the building. <sup>SMOKE OR HEAT SHALL BE PROVIDED</sup> Openings into the shaft shall be protected with an automatic single piece shutter located as high in the room as possible and designed to vent the entire compartment.

5. Any other design which will produce equivalent results <sup>(see attached Vent Sizing)</sup> <sup>IN THE OPINION OF THE BUREAU OF BUILDING DEPARTMENT</sup> WILL BE ACCEPTED.

(i) Elevators

At least one elevator in each bank available for Fire Department access to any floor shall be provided. The elevator shall open into a lobby, which may serve additional elevators, and shall be separated from the remainder of the building by construction as required for corridors. An elevator may be within a smokeproof enclosure. See Chapter 51 for additional requirements.

(j) Standby Power and Light.

A permanently installed stand-by power generation system conforming to UBC Standard No. 18-1 (to be based on NFPA 70-1971, the National Electrical Code) shall be provided. The system shall be equipped with suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of all required electrical functions at full power within 60 seconds of such normal service failure. System supervision with manual start and transfer features shall be provided at the Central Control Station.

An on-premise fuel supply sufficient for not less than 2 hours full demand operation of the system shall be provided. All power, lighting, signal and communication facilities provided under the requirements of this section shall be transferable to the stand-by power system.

The power requirement shall be determined so as to provide service to, but not limited to the following:

1. Fire alarm system.
2. Exit and other emergency lighting.
3. Fire Protection equipment.
4. Required mechanical ventilation.
5. Fire Department elevator.
6. Voice communication system.

(k) Seismic Considerations.

In Seismic Zones 2 and 3 the anchorage of the following mechanical and electrical equipment required by the section shall be designed in accordance with Section 2314 for a lateral force based on a "Cp" value of 0.5

39000 X 10 = 300000  
 = 109000 cfm  
 2000' / M = 50 FTZ  
 1000' / M = 25 FTZ  
 2.5 X 10  
 15000 FTZ X 10 = 150000 FTZ  
 1 MIN = 150K cfm  
 2 MIN = 75K  
 3 MIN = 50K  
 4 MIN = 37.5K



unless data substantiating a lesser value is furnished:

1. Elevator drive and suspension systems.
2. Standby power and lighting facilities.
3. Fire pumps and other fire protection equipment.

(1) Exits

All stairway doors which are to be locked from the stairway side shall have electric strikes which can be automatically unlocked upon a signal from the Central Control Station.

Degenkolb Note: Since stairway doors are fire doors and are required to be latched when closed, the electric signal is to unlock the door so that it can be unlatched from the stairway side. The electric strike activation is not to leave the door unlatched and free to swing. The object is to keep smoke out of the stairway and an unlatched door would not so perform.

Emergency telephones shall be provided at not less than every fifth floor in each required stairway.

(m) Fire Sprinkler Alternative

Sprinkler protection may be provided as an alternate to compartmentation:

1. If the sprinkler system is hydraulically designed using the parameters set forth in UBC Standard No. 38-1, Section \_\_\_\_\_ (to be based on Chapter 8 of NFPA 13-1972) and the following:
  - a. Shut off valves and waterflow devices shall be provided on each floor. In addition to actuating a local alarm on the floor upon which the water flow is detected, such valves shall be supervised by a continuously manned control station or by a central station.
  - b. The sprinkler system shall be looped between standpipe risers at the bottom, top and mid-height of all buildings with a maximum of 20 stories served by any loop. At each loop level there shall be check valves.
  - c. Piping may be copper or steel with no minimum size of pipe required. Solder connections may be used if not less than 95 percent tin and 5 percent antimony.
  - d. Pitching of lines is not required.
  - e. A minimum of 2 fire pumps independently driven shall be provided and sized for the sprinkler demand and for a minimum 500 gallons per minute Fire Department standpipe operation.
  - f. An on-site supply of water equal to a 20 minute demand or 15,000 gallons on a combined sprinkler and standpipe, which ever is the smaller, shall be provided. This supply shall be available automatically if the principle supply fails.



- g. Operation of the sprinkler system shall activate the voice communication system.
2. When the automatic sprinkler system described above is installed, the following reductions from this code are permitted:
- a. The fire-resistive time periods set forth in Table No. 17-A may be reduced by one hour for interior bearing walls, exterior bearing and non-bearing walls, ~~floors~~, roofs and the beams supporting ~~floors and~~ roofs provided they do not frame into columns. All office building partitions required to be of one-hour fire-resistive construction by Table No. 17-A and Section 3304(h) may be of construction permitted by Sec. 1801 without a fire-resistive time period except that openings in corridor walls may have self-closing tight fitting doors. In Group H occupancies, corridor and dwelling unit or guest room separations may be reduced to one-half hour.
  - b. The one and one-half inch hose lines and nozzles may be omitted.
  - c. Travel distance to a horizontal exit or to an enclosed stairway may be 300 feet.
  - d. Smokeproof enclosures may be eliminated if each required stairway is pressurized as provided in Section 3309(h) to .15 inches of water column.
  - e. Compartmentation and spandrel protection required by Section 1807(b) may be omitted.

*Suggest use of  
200 gpm per door  
max 10 floor  
for supply.*

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Degenkolb Note: Some re-editing of 2(a) above is needed. I believe that the intent was to permit the use of fire retardant treated wood in lieu of non-combustible materials provided that the FRTW was encased as in a one-hour wall. I do not believe it was the intent to permit walls to be of bare fire-retardant treated wood. It is my understanding that the provisions of Section 1705 on fixed partitions are acceptable.

Corridor walls may be of noncombustible materials or of protected fire-retardant treated wood but the doors need not be 20 minute doors. I believe that it is intended that "door openings in corridor walls shall be self-closing and tight fitting but need not meet the 20 minute fire-endurance requirement".

Note that the 40 foot dead end corridors were not allowed nor was the elimination of fire dampers. A reduction in the rating of floors was not approved.

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SECTION 1705 (a) Fixed Partitions. Regardless of the fire resistive requirements for permanent partitions, partitions dividing portions of stores, offices, or similar places occupied by one tenant only, and which do not establish a corridor serving an occupant load of 30 or more, may be constructed of:

1. Noncombustible materials.
2. Fire-retardant treated wood.
3. One-hour fire-resistive construction.
4. Wood panels or similar light construction up to three fourths the height of the room in which placed; when more than three-fourths the height of the room, such partitions shall have not less than the upper one-fourth of the partition constructed of glass.

SECTION 1801. The structural elements in Type I Buildings shall be of steel, iron, concrete, or masonry.

Walls and permanent partitions shall be of noncombustible fire-resistive construction except that permanent nonbearing partitions of one hour fire-resistive construction may use fire-retardant treated wood (see Section 407) within the assembly.

Materials of construction and fire-resistive requirements shall be specified in Chapter 17.