California Fire Chiefs Association
Fire Prevention Officers Section

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California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833

RE: PUBLIC COMMENT on PROPOSED BUILDING STANDARDS by THE OFFICE OF THE STATE FIRE MARSHAL (OSFM).

We would like to bring to the Building Standards Commission some concerns that the Fire Prevention Officers Section of Cal Chiefs has pertaining to proposed Building Standards by the Office of the State Fire Marshal to adopt the 2019 edition of Title 24, specifically the California Building, Residential, Fire, and Reference Standards Codes. It appears that this rulemaking package has technical errors, procedural errors and conflicts with state laws. We have provided the following comments to assist both the Commission and the OSFM in revising and approving the rulemaking package:

1. Modifications proposed to the definition of High-rise conflict with Health and Safety Code (HSC) 13210.

2. Modifications proposed to California Building Code (CBC) Section 403 relating to High-rises appear to conflict with HSC 13210 and further create additional confusion. Additional sections throughout the code where the existing OSFM amendments relating to "…I-2 occupancies having occupied floors located more than 75 ft above the lowest level of fire department access..." and replacing such with applicable Group I-2 occupancies creates confusion. The current code is clear and correlates with statute developed back in 1972 for hospitals. We do not feel these modifications are editorial and need further justification.

3. Modifications proposed to CBC Sections 403.3.2 and 403.3.2.1 appear well intended, however, these are not editorial nor do they clarify. The modifications proposed put back model code text that was specifically amended to address the needs of local fire departments.

The following is from the OSFM ISOR for the adoption of the 2013 CBC that justifies that the existing OSFM language should be maintained:

403.3.2
Rationale: SFM is proposing this amendment because all high-rise buildings in California require a secondary on-site water supply (CBC 903.3.5.2). The additional reliability of connecting the sprinkler system supply to two separate water mains in different streets does not appear to be necessary for high-rise buildings under 120 feet in height that pose a lesser risk than taller high-rise buildings. The 120 feet threshold for fire service access elevators and redundant fire pump systems was chosen. This amendment will result in significant construction cost-savings for buildings in this category. This amendment correlates to SFM proposed amendment CBC 403.3.2.1 regarding redundant fire pump systems.

403.3.2.1
Phase 1 Recommendation:
2 – Add a new Section 403.3.2.1 to require a redundant fire pump for tall buildings.
Phase 1 Statement of Reasons (If Already Developed):
The failure of a fire pump impairs the water supply to fire protection systems in a building. In case of fire pump failure in buildings greater than 120 feet in height, the public water supply may not be adequate to supply the automatic fire sprinkler and standpipe systems. A redundant fire pump increases the reliability of the system that serves fire suppression systems when one of the pumps is out of operation.

Rationale: The SFM is proposing this amendment to require redundant fire pump systems for high-rise buildings greater than 200 feet in height. Initially the SFM High-rise Task Force proposed recommendations for 120 (see example below for rational for such systems). However, during the Building Standards Commissions Code Advisory Committee hearing for the SFM rulemaking package the 120 foot trigger was requested to be further studied prior to the initial 45-day comment period to determine if the 120 foot should be revised to 200 or 225 feet.

The SFM has additionally reviewed local enforcing agencies ordinances that require redundant fire pump systems for high-rise buildings and has revised the height trigger to not place a more restrictive provision beyond what is currently implemented by local enforcing agencies.
The following are example of several local enforcing agencies' requirements/triggers:

- Glendale all high-rises
- Los Angeles City 150 ft
- Orange County Fire Authority 15 stories (approximately 135 ft to 195 ft)
- Sacramento all high-rises
- San Francisco 200 ft

Additionally NFPA 20 – 2013 edition that is proposed to be adopted indicates that "most urban fire departments have the capability of getting sufficient water at sufficient pressure up to the top of a 200 foot tall building."
(See Annex A, Section A.5.7.)

Furthermore, fire departments in most California cities are capable of providing water to that height through their pumping apparatus, which can conservatively supply 250 psi. 225 feet equates to roughly 150 psi including friction loss and static pressure, which would leave roughly 100 psi at the roof for hose streams, which complies with NFPA and CBC requirements. The 200 foot is chosen instead of 225 foot, as this adds a little more conservatism to the requirement. This proposal would still allow individual cities to retain their existing ordinance for a lower trigger.

The SFM agrees with the committee comments and has made the revision to 200 feet accordingly.

This amendment will help ensure that adequate water is available for the building automatic sprinkler system and the fire department standpipe system provided for the fire department to fight fires on upper floors of high-rise buildings that are greater than 200 feet tall (about 16 to 22 stories). This amendment also requires each fire pump system to independently serve the required design demands for both the automatic sprinkler and standpipe systems in the building.

The failure of a fire pump will significantly impair the water supply to the water based fire protection systems in a building. In the case of a fire pump failure in buildings greater than 200 feet in height, the public water supply will most likely not be adequate to supply the automatic sprinkler and standpipe systems above that height. See the example described below. A redundant fire pump system greatly increases the reliability of the water based fire protection systems when any one of the fire pumps may be out of operation for repairs or maintenance or is otherwise inoperable or fails. This SFM amendment correlates with the SFM amendment to CBC Section 403.3.2.

Example:
Determine the height threshold to require a secondary fire pump. Illustrate the water pressure distribution for the fire protection systems as the elevation increases, assuming the primary fire pump is out of operation.

Assumptions:

- Pump Bypass is provided
  - NFPA 20 Section 5.14.4 states: "Where the suction supply is of sufficient pressure to be of material value without the pump, the pump shall be installed with a bypass".

- Automatic Sprinkler System
  1. The typical building occupancies include primarily office space and residential units (low hazard).

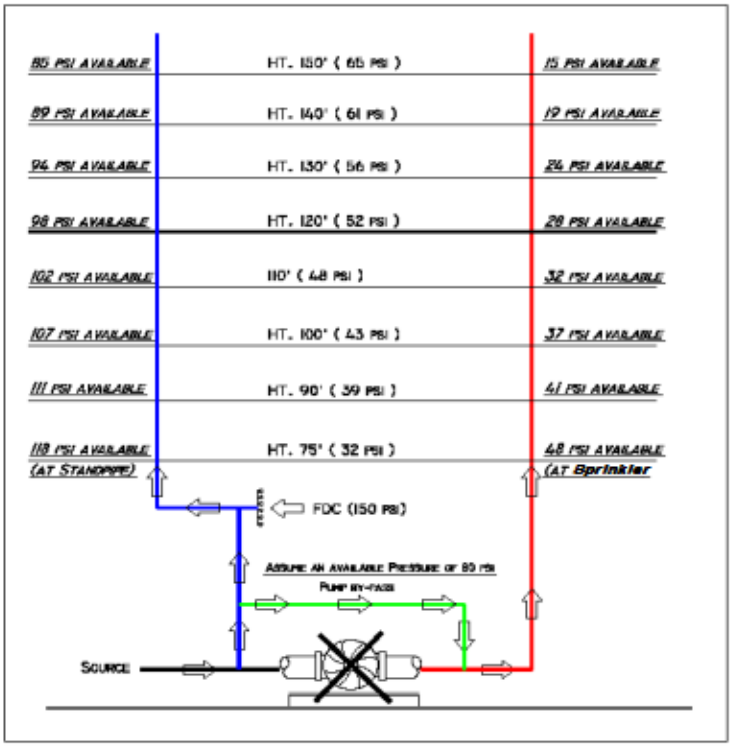
2. The least amount of water demand (Item #3) is assumed to control the fire in the occupancies listed in Item #1.
3. Water demand is calculated based on flowing four sprinklers with a total discharge of 70 gpm at a minimum pressure of 7 psi at the sprinklers.
4. The automatic sprinkler system distribution piping is a loop system. The overall friction loss is calculated to be about 10 psi.
5. A factor of safety of 10 psi is factored in. The demand at the standpipe connection is *27 psi flowing 70 gpm.*
6. Friction loss in the standpipe is ignored as being insignificant (0.0005 psi/ft)

- Manual Fire Department Hose Valves:
  - Minimum pressure required at the hose valve outlets is 100 psi. NFPA 14 requires a minimum residual pressure of 100 psi at the outlet of the hydraulically most remote 2½ inch hose valve connection. Many fire departments require additional pressure at the hose valve outlet in order to get 100 psi at the hose nozzle due to friction losses in the hose.

- Water supply:
  - Available residual pressure of 80 psi at the pump bypass.

Hydraulic Calculations:

- The schematic diagram below depicts the two water based fire protection system scenarios described above and shows the available pressure at each level for each scenario. The standpipe pressures assume the fire department will pump into the standpipe system at the standard operating pressure of 150 psi.
- The break point is about 120 feet in height where the building height elevation exceeds the fire pump bypass capacity to meet automatic sprinkler system demand and the Fire Department pumper's capacity to meet the standpipe hose demands.



4. Modifications proposed to CBC Section 435.8.7 appear to conflict with HSC 13131.5(b). Furthermore, these modifications will increase the cost of construction and the OSFM has provided no justification for such. The OSFM existing provisions should be maintained.

5. Modifications proposed to CBC Table 602 undo a concession made when fire sprinklers were adopted in California. These modifications allowed for R-3s that were sprinklered to be up to 3 feet to the property line before fire resistance construction would be required.

6. Modifications proposed to Sections throughout the codes to introduce Group R-2.2 have created a new dynamic that will impact Group R-2.1 in how the code is used. Group R-2.1 in many sections are not identified and the main construction provisions of the R-2 would apply. It is recommended that the OSFM put R-2.1 in those sections where it is missing and applicable. An example is 1005.7.1.

7. Modifications proposed to CBC and California Fire Code (CFC) Sections 1005.3.1 Exception 5 and 1005.3.2 exception 5 need to be maintained to adequately address aisles in assembly areas. The removal of the exceptions will create confusion and inconsistent enforcement.

8. Modifications relating to mobile fueling should be adopted through California Code of Regulations, Title 19 as these provisions proposed do not appear to be Building Standards in accordance with HSC 18909. The OSFM issued Information Bulletin 18-004 to address an error regarding the adoption of the model code provisions for the 2016 CFC.

Thank you for your consideration.

Sincerely,

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California Fire Prevention Officers

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