

those currently allowed by both the SBCCI Standard Building Code and the ICBO Uniform Building Code where previously adopted. Basically, this code change proposal will bring the International Building Code somewhat closer to what was previously allowed for building heights in feet by all three of the legacy model codes from which the IBC evolved.

In conclusion, the 20 foot increase in the allowable building height currently allowed by the IBC will pose more of a challenge to the responding fire department to gain access to the roof or the upper floors of such buildings. This may mandate that they utilize more sophisticated ladders and aerial equipment which complicates their fire fighting and rescue efforts. Increased height means more time will be required to gain access to the roof or the upper stories of the building which delays rescue, as well as fire fighting operations, should the fire be on the upper floors or the roof. This will potentially reduce the overall level of fire and life safety provided in these buildings even though an automatic sprinkler system is installed. Since automatic sprinkler systems are not foolproof or fail safe, they may not be available at a critical time when a fire gets out of control and the fire department must respond to deal with a fire on the upper story of the building or the roof. This is even more critical in seismically active areas where an earthquake can knock out the water supply to the sprinkler system. Earthquakes will also put a greater demand on fire departments since they will be responding to multiple incidents and they will face more challenges if the buildings are allowed to be 20 feet higher than would have been allowed by any of the legacy codes. This will certainly result in more property damage and more risk for the building occupants, as well as the fire fighters who may have to respond to an uncontrolled fire in such buildings.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

G124-07/08

504.2, 506.3

Proponent: John Dean, National Association of State Fire Marshals (NASFM) and Ken Kraus, Los Angeles Fire Department, CA

1. Revise as follows:

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.
4. This increase is not permitted in addition to the area increase in accordance with Section 506.3.

2. Revise as follows:

506.3 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent ($I_s = 2$) for buildings with more than one story above grade plane and an additional 300 percent ($I_s = 3$) for buildings with no more than one story above grade plane. ~~These increases are permitted in addition to the height and story increases in accordance with Section 504.2.~~

Exception: The area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in Group H-1.
2. The automatic sprinkler system increase shall not apply to the building area of an occupancy in Group H-2 or H-3. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.3.3.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.
4. These increases are not permitted in addition to the story increases in accordance with Section 504.2.

Reason: Dean. Code officials recognize and support the benefits of automatic fire sprinkler protection in buildings. The need for a balanced

approach to fire protection is also recognized and is the basis for this proposal which permits the use of a sprinkler system for an increase in height or area but not both. During California's statewide code adoption process, building and fire code officials reviewed data from various sources in an attempt to justify the increased building size over the allowable areas/heights in all three legacy codes. What they concluded was that there appeared to be little science behind the table values and formulas and code officials are not comfortable with the elimination of redundancy from the code and an over-reliance on fire sprinkler systems. Several factors support the need to restore balance to this code:

- o There is a public expectation of the level of safety inherent in the current codes which become policy upon local adoption. The west coast has a lower fire loss record than the rest of the country, which may be, at least partially attributed to construction requirements. There is an increase in risk that accompanies larger building sizes which cannot be justified in light of national fire statistics that are among the worst of any other industrialized nation.
- o There are no redundant mitigating protective features to address the potential for sprinkler failure due to a disruption in water supply, mechanical failure, lack of proper maintenance, human error, or temporary disruptions to sprinkler systems that occur during typical remodeling and tenant improvement projects. Furthermore, reductions in water supply usually result after weather-related or seismic events, which would render an automatic sprinkler system ineffective if a fire were to occur. What is the true reliability of a sprinkler system? A recent article cites 89% as the figure when both the performance and operational reliability are factored in. They are out of service for maintenance, construction, (tenant improvements), unintentional human error. There is also a vulnerability factor- besides seismic, we have experience where systems were taken out by vehicle crash or explosion. In instances of improper design/use or arson, the system can be overcome. Sprinkler systems often don't extinguish the fire and there can be tremendous smoke generation and spread (particularly smoldering or shielded fires, etc). In fact, sprinklers drive the smoke lower and impede visibility, building size becomes more of an issue to both rescue (panic) and firefighting.
- o The quantity and capability of emergency response resources is based on the same infrastructures and building designs that have existed in the United States for decades. Therefore, the level of fire and life safety would be decreased below what we have today in terms of building size. Public safety departments are staffed for current building sizes and larger buildings may lead to larger fires and need for staffing/tactical/infrastructure changes which may not be financially or politically feasible.
- o This results in a decreased level of public safety because fire rescue and fire suppression responders would be required to accomplish their emergency response tasks in larger multi-story buildings without the benefit of increased fire protection based on a combination of sprinkler, fire-resistive construction, and fire walls.

By limiting the use of a fire sprinkler system to an increase in height or area, but not both, serves to restore balance to the code by reducing over reliance on those systems.

Kraus: The intention of this code change proposal is to trim the Height and Area provisions of the IBC by allowing additional height or area as a tradeoff for fire sprinklers. Currently, if you install sprinklers for the benefit of additional height, you may also then also, without providing any further protection, add additional area. The same is true if you install sprinklers in order to take the additional area provision. There are many ways to adjust the height and allowances of the IBC. I have chosen this particular section and mechanism because previous similar proposals have seemed to resonate with the membership, i.e., Final Action Hearing discussions.

There exist 3 primary reasons that mandate modification to the height and area provisions of the International Building Code, specifically:

1 – The lack of fire history for buildings constructed to the current IBC height and area requirements.

During previous code hearings and at various committee meetings this sentiment was offered to console individuals that, after calculating height and area values under the IBC, found the IBC allowed buildings to be constructed taller and much larger (by a factor of 2 to 3) than any legacy code or BCMA recommendations. This reality came to the forefront after the Orlando code development hearing and caused, presumably and in part, the CTC BFP Work Group to rethink height and area. Once the Work Group identified some 50 "anomalies", concern grew when the science used to formalize Table 503 values could not be harnessed to the point that rendered confidence. Add to this, the fact that the legacy groups had somewhat different height and area enhancements, (increased allowances or multipliers for location on property, type of construction, multiple stories etc). While these factors seemed to stand the test of time regionally, the additive combining of these elements and their influence on the suspect tabular values brings into question the efficacy of IBC Chapter 5 which allows buildings to be constructed both taller and larger than any legacy code.

These comments should not be considered a criticism of the effort of the drafting committee whose task was formidable and time constraints demanding.

2 - The value afforded to fire sprinkler systems.

While Fire sprinklers are well established as the single most important fire protection element in the fire and life safety toolbox they are not a panacea. The dynamic nature of fire incidents and the potential for life loss preclude the acceptance or over reliance on a single protective. Various and diverse tools must be employed to ensure that structures react in a predictable manner even when certain elements don't perform as designed. There are times when sprinklers don't perform satisfactorily. Some examples are:
 Interruption of water supply due to natural disaster, intentional acts, unintentional careless acts (maintenance/construction).
 Ineffective activation due to change in commodity or construction feature, improper storage, faulty sprinkler heads.

Each Legacy group had numerous tradeoffs for sprinklers but also made deliberate decisions to not institute other tradeoffs. By melding together each regions protection package, the IBC effectively voids the intentional non-inclusion of tradeoffs by the legacy groups.

3 - A prevailing rationale used in selecting the tabular values in 503, i.e., not to create non-compliant buildings upon adoption of the IBC.

This problem is faced each time a local or state jurisdiction adopts a new code or updates existing requirements. Buildings built to previous editions are automatically out of compliance with the new code. This perception is tempered by the fact that these buildings are still regulated by the code in effect when they were built, (except for retroactive requirements).

While not creating non-compliant buildings is a justifiable consideration, it is not a primary intent of the IBC. The intent of the IBC is to safeguard the public health, safety and general welfare through various means and to provide safety to life property and emergency responders. Over reliance on the non-complaint building concern may have, in some cases, caused these primary tenets to be relegated to secondary in importance.

Regarding related / concurrent proposals. I respect and support both the Balanced Fire Protection Work Group and their efforts. Time constraints have prevented me from fully assimilating their IBC Chapter 5 proposal.

I urge the Committee to weigh in the balance this proposal as a reasonable method of addressing an element of what has been the single most debated issue since the issuance of the final draft of the IBC.

Cost Impact: Dean: The code change proposal will not increase the cost of construction.

Kraus: This code change will increase the cost of construction.

Public Hearing: Committee: AS AM D
 Assembly: ASF AMF DF