

**FINAL STATEMENT OF REASONS
FOR
PROPOSED BUILDING STANDARDS
OF THE
OFFICE OF THE STATE FIRE MARSHAL
REGARDING THE ADOPTION BY REFERENCE OF THE
2006 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC)
WITH AMENDMENTS INTO THE 2007 CALIFORNIA BUILDING CODE
CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 2.**

The Administrative Procedure Act requires that every agency shall maintain a file of each rulemaking that shall be deemed to be the record for that rulemaking proceeding. The rulemaking file shall include a final statement of reasons. The Final Statement of Reasons shall be available to the public upon request when rulemaking action is being undertaken.

Health and Safety Code Section 18930 is part of the Building Standards Law that includes a nine-point written analysis that is required to be submitted by the Office of the State Fire Marshal for approval by the California Building Standards Commission prior to the adoption of building standards submitted by the Office of the State Fire Marshal. Under subpart (d) the Commission must give great weight to the determinations and analysis of the Office of the State Fire Marshal for each of the nine-point criteria submitted. Any factual determination used in the nine-point analysis by the Office of the State Fire Marshal shall be considered conclusive by the Commission unless the Commission specifically finds and sets forth in its reasoning in writing that the factual determination is arbitrary and capricious or substantially unsupported by the evidence considered by the Office of the State Fire Marshal.

TABLE OF CONTENTS

	Page
INTRODUCTION TO FINAL STATEMENT OF REASONS	2
UPDATES TO THE INITIAL STATEMENT OF REASONS	18
MANDATE ON LOCAL AGENCIES OR SCHOOL DISTRICTS	24
OBJECTIONS OR RECOMMENDATIONS MADE REGARDING THE PROPOSED REGULATION(S)	24
DETERMINATION OF ALTERNATIVES CONSIDERED AND EFFECT ON PRIVATE PERSONS	54
REJECTED PROPOSED ALTERNATIVE THAT WOULD LESSEN THE ADVERSE ECONOMIC IMPACT ON SMALL BUSINESSES	54
COMMENTS MADE BY THE OFFICE OF SMALL BUSINESS ADVOCATE	54
COMMENTS MADE BY THE TRADE AND COMMERCE AGENCY	54
APPENDIX A	55
APPENDIX B	56
APPENDIX C	57
APPENDIX D	64
APPENDIX E	65

INTRODUCTION TO FINAL STATEMENT OF REASONS

SFM Commitment

California's first partnership with the International Building and Fire Codes is almost complete. During this past year, the Office of the State Fire Marshal (OSFM) has been working tirelessly to bring you the best set of building and fire code proposals possible. Several key things are important to remember:

1. The OSFM is committed to this adoption and believes strongly in the value of the ICC code process and the overall quality of the I-Codes.
2. The OSFM has taken extraordinary measures to ensure that this package represents the best in fire and life safety considerations, stakeholder involvement and economic considerations.
3. Both Fire and Building Code professionals have worked in concert under consensus-based guidelines to develop this package which now enjoys wide support.

This document is intended to be an overview for the entire submittal package and provides both the bigger picture perspective as well as specific analysis. Other portions of the submittal package such as "Response to Comments" and the Nine-Point Criteria refer back to it at times. The five main sections of this "Introduction" are:

1. IBC History
2. SFM Philosophy
3. Reasons for Proposed Amendments
4. Reasonable Solutions and Impacts
5. Final Conclusion

The adoption of an entire new set of building and fire codes is a complex task. The OSFM, along with the other state agencies, the Building Standards Commission and its Committees, and stakeholders have worked together this past year to produce this package. This document will clearly demonstrate that the OSFM proposals are necessary, reasonable, and deserve your support.

1. IBC History and Philosophy

The International Building Code (IBC) was created in the late 1990's when the three regional 'legacy' codes were merged into a single model code. This extremely complex task took several years and the first edition of the IBC was published in 2000. Since that time, growing numbers of jurisdictions across the country have adopted it, modified it, and called it their own.

The concept of a single building code for the nation is grounded in the economic efficiency gained by unified design and building criteria. It is cheaper to create, maintain, design and build to and enforce a single set of building standards. While a worthy concept, it must be recognized that this is a goal and not an absolute. No responsible city or state adopts a model code without thoroughly analyzing their geographic, climactic, and topographic characteristics as well as their public expectation of acceptable risk, demographics, economic conditions, public safety infrastructure and loss history.

We have exercised due diligence in this analysis and the OSFM is submitting for your approval a set of amendments to the IBC that we believe adequately addresses California's:

1. Statutory Mandates for Fire and Panic Safety
2. Natural Hazards (Seismic, Flood, Fire, Wind)
3. Life Safety and Property Loss
4. Vulnerable Populations (Persons with Disabilities, Non-English Speaking, Aged/Youth, Special Needs)
5. Social Perceptions of Acceptable Risk

2. SFM Adoption Philosophy

At the outset of this code adoption project (September 2005), State Fire Marshal Ruben Grijalva outlined a detailed guidance document that served as a foundational cornerstone for the OSFM amendment process. The key concepts from that document are still in effect today and include:

"It is the intent of the OSFM to utilize a "holistic" approach in evaluating the IBC vs. UBC and IFC vs. UFC in terms of the level of protection provided by these model codes. This approach would offer that both codes, while providing a minimum level of fire/life safety in distinctly different manners, when viewed "holistically" could be seen as substantially equivalent. One code's reliance on the performance of fire-extinguishing systems and more performance-based approach, as opposed to prescribed built-in fire-resistive features and intentionally redundant fire protection provisions may make side-by-side comparisons difficult for even the most technically proficient professionals based on differing strategies of fire and life safety protections.

This approach requires that the comparison and subsequent amendment of the IBC to incorporate UBC or CBC provisions be done in a deliberate and thoughtful manner. Another result of this approach could be fewer State amendments, as the decision of which existing amendments to carry over could be made on a case-by-case basis. It also emphasizes a need to either participate in, or, at the very least, closely monitor development of the model code in order to assure the future safety of California.

Stakeholder participation and input will be requested throughout the entire process. The development and review process will include several levels of review. A core workgroup will include representatives from state agencies with statutory authority, California Building Officials Association and California Fire Service. The intent is that the first draft will be developed by those without a financial interest in the outcome of the code. Subsequent review(s) will incorporate design professionals and industry representatives."

In addition, SFM Grijalva also directed that each and every amendment be reasonable, effective, and "make a difference".

The entire OSFM package development has been an extremely open process from November 2005 to today. We organized a Core Committee of Fire and Building Officials, and State Agency representatives that served as the final voting review committee. Each occupancy classification was assigned to a Work Group with designated leaders and open membership to AHJ's, industry or interested parties. (See Appendix A – Core and Work Group Leaders)

All meeting locations, agendas and minutes were published on the SFM website where they remain today at <http://osfm.fire.ca.gov/CodeAdoptionProcess.html>. Stakeholder Mailing Lists were constructed and three stakeholder meetings were conducted around California in January, February and March, 2006. Agendas, minutes, and recorded comments were also provided on the website. Finally, while the predominant number of amendment proposals came from the work groups, any single individual could submit a proposal which was reviewed by the Core Committee.

All monographs and Express Terms were published on the web page as they developed and the overall approach from the OSFM was to engage continuously with affected stakeholders and seek mutually acceptable compromises. From the first drafts to today's submittal, over 90% of items at issue have been resolved. All in all, the process duplicated almost identically that used by the ICC and was open, communicated, and documented for public access. (See Appendix B – Schedule of Key Events)

Concept of Acceptable Risk

Inherent in all discussion of public safety is the concept of acceptable risk. The *ICC Performance Code for Buildings and Facilities (2006)* is a comprehensive guidance document that details a structured approach to risk analysis relative to building safety and has been used by the OSFM in constructing a rational approach to level of risk based on risk and hazard factors, and level of community importance of the building.

Some of the key considerations include:

302.4.1 Nature of the hazard. The nature of the hazard, whether it is likely to originate internal or external to the building or facility, and how it may impact the occupants, the building or facility, and the contents.

302.4.2 Number of occupants. The number of persons normally occupying, visiting, employed in, or otherwise using the building, facility, or portion of the building or facility.

302.4.3 Length of occupancy. The length of time the building or facility is normally occupied by people.

302.4.4 Sleeping characteristics. Whether people normally sleep in the building.

302.4.5 Familiarity. Whether the building or facility occupants and other users are expected to be familiar with the building or facility layout and means of egress.

302.4.6 Vulnerability. Whether a significant percentage of the building or facility occupants are, or are expected to be, members of vulnerable population groups such as infants, young children, elderly persons, persons with physical disabilities, persons with mental disabilities, or persons with other conditions or impairments that could affect their ability to make decisions, egress without the physical assistance of others or tolerate adverse conditions.

302.4.7 Relationships. Whether a significant percentage of building or facility occupants and other users have family or dependent relationships.

Along with the above risk factors, the social and behavioral factors of the occupants must also be considered when determining acceptable risk. The *ICC Performance Code for Buildings and Facilities (2006)* defines these values for each occupancy type.

Following are examples of the **Assembly** and **R-2 (Multi-Tenant Residential)** Occupancy Risk Factors.

A103.1.1 Assembly. A building, structure or portion of a building or structure in which persons gather for purposes such as civic, social or religious functions, recreation, food and drink consumption, or awaiting transportation. Unless otherwise modified under a specific sub-use classification, occupants, visitors and employees shall be assumed to be awake, alert, predominantly able to exit without the assistance of others, and unfamiliar with the building or structure. Vulnerable populations of many types may be expected to be present; however, the buildings are normally occupied for only short periods of time. It shall be assumed that:

1. Risks of injury and health assumed by occupants and visitors during their use of the building or structure are predominantly involuntary.
2. Public expectations regarding the protection afforded those occupying, visiting or working in an assembly, building, structure or portion thereof are high.

A103.1.8.2 R-2, Multi-tenant residential. A residential occupancy where the occupants are primarily permanent in nature and that contains more than two dwelling units. It shall be assumed that:

1. Occupants and visitors are not awake, alert, or able to exit without the assistance of others.
2. Occupants and visitors are familiar with the building or structure.
3. Risk of injury and risk to health assumed by occupants and visitors during their use of the building or structure are predominantly voluntary.
4. Public expectations regarding the protection afforded those occupying, visiting, or working in the R-2 residential building, structure, or portion thereof are neither unusually high nor unusually low.

These risk factors form a foundation for analyzing the building and its occupancy, then assigning it a Performance Category I-IV. Examples are as follows:

Category I Buildings -	Low risk, Agricultural, Storage, or Temporary Facilities.
Category II Buildings -	All buildings except I, III, or IV buildings
Category III Buildings-	Buildings that represent a substantial hazard to human life such as assembly with more than 300 people, educational, institutional, jails, moderate hazard class, and non-surgical or emergency health care facilities.
Category IV Buildings-	Essential Services buildings such as police and fire stations, communication centers, hospitals, fire suppression water treatment facilities, high hazard class occupancies, and any ancillary facility supporting fire suppression infrastructure.

Our amendment package appropriately targets the Category III and IV occupancies for a higher level layered fire protection based upon these ICC recommendations as applied to our seismic conditions in California.

Amending the Model Code

The OSFM has received opposition comments and criticism for amending the model code and the question of need has been raised. This document, along with the 9-pt Criteria and supporting submittals should be sufficient to answer the question of need.

First, it is necessary to orient to the overall set of amendments. While large in total number, once you begin to break them down, you can quickly set apart the ones that are substantial vs. the ones that are small in impact. Half are driven by direct statutory requirements incumbent upon the OSFM, and many others are attributed to leading code development issues such as Wildland-Urban Interface Building Standards or Motion Picture provisions.

Focus can be narrowed to the most significant and/or controversial amendments. These are primarily found in Chapter 5 and have centered on the General Height and Area provisions. In the following list, the total number of amendments is categorized into their relative area of impact and the amendments receiving the most attention are categorized as “Other” at the bottom of the list.

Most important is our approach to these amendments – they are small in number, precise in scope, and limited to those high-risk occupancies that the OSFM specifically regulates due to their potential for life loss. Their overall impact on the state of California or any particular industry or stakeholder is negligible to non-existent.

Finally, the OSFM Amendment Package has the widespread support of California Building and Fire Officials and many industry representatives. We believe that the comments of opposition to our package largely stem from misunderstandings about the scope of our proposals or concern about specific industry market share.

<u>Number of Amendments</u>	<u>Description (Chapter/Item)</u>
149	International to California
45	Chapter 2 – Definitions
38	Chapter 3 – Definitions
73	Care Facilities (I-1, I-4, R-3.1, R-4) (Statutorily Driven)
14	Large Family Daycare Homes (Statutorily Driven)
18	High-Rise (Statutorily Driven)
45	Group “L” Occupancies (The existing H-8 Occupancy)
34	Group “C” Occupancies (Camps) (Statutorily Driven)
28	Wine Caves (Statutorily Driven)
78	Fixed Guideways Transit Systems (FGTS) (Statutorily Driven)

3	Motion Picture & Television Production Studios (Statutorily Driven)
34	Explosives – (Title-19, CCR) (Statutorily Driven)
13	Combustion Engines/Electric Vehicle
14	Group “E” Occupancies (Statutorily Driven)
31	SFM Elevator Requirements
33	Existing R-1/R-2 (Statutorily Driven)
6	Existing R-1 High-Rise (Statutorily Driven)
32	Existing High-Rise (built prior 1975) (Statutorily Driven)
3	Existing Dwellings (Statutorily Driven)
6	Public Libraries (Statutorily Driven)
43	Group I-2, I-2.1 Occupancies (Statutorily Driven)
41	Group I-3 Occupancies (Statutorily Driven)
47	Chapter 7A – Exterior Wildfire Exposure (Statutorily Driven)
117	Chapter 35 – Referenced Standards
125	Correlation between Fire Code and Building Code - Chapter 9 (Amendments duplicated from the Fire Code to maintain consistency with IBC/IFC Model Code Format)
73	Other Amendments Chapter 10/Mean of Egress [29] Chapter 5 [12] Height and Area [3] High-Rise Smoke Control [10] Corridors – 1-Hr/Smoke/Openings [15]

1,143 Amendments (588 Statutorily Driven)

While much has been made about the OSFM package containing 1,143 amendments, the vast majority are statutorily mandated or necessary clarifications specific to California. Only 73 amendments are classified as “substantively new” amendments to the 2006 International Codes and of those, only a small percentage (related to height and area provisions) have received significant negative comment.

3. Reasons for Proposed Amendments

As the legacy codes were merged, there was discussion about how to handle the widely varying height and area provisions found in each of the three codes. It was sufficiently complex that the drafting committee chose to use an existing formula that had been in discussion for several years. Life and property loss data was determined to be of such poor quality and relevancy that a data-based approach to height and area was impossible to construct.

A decision was made to simply use the base formula, then modify it so that no building would be considered non-conforming and that no region of the country would find the code more limiting than the one they were used to. This resulted in the Uniform/ICBO users generally finding that the IBC buildings are significantly larger than those they are used to.

A widely held perspective is that the buildings now being constructed under the IBC are formed of construction types, heights and areas that are larger and differently configured than any previous code allowed. This forms the foundation of the controversy around the “Height and Area” discussion as well as whether the IBC has an adequate level of balanced and/or layered fire protection.

Since the first IBC publication in 2000, this controversy has grown in volume and an increasing number of code proposals have been proposed with each cycle. With California’s entry into the I-Codes adoption process, the issue has taken on greater significance since we represent such a major stakeholder.

The OSFM is committed to pursuing this issue to an acceptable level of conclusion and supporting the IBC fully. Meanwhile, we are making recommendations for reducing some area increases for the high-risk assembly, educational, institutional, residential, high-rise and hazardous occupancies.

The three amendments in Chapter 5 (Sections 504.2, 506.3, and 506.4) comprise the bulk of the Height and Area amendments and the OSFM will demonstrate to the Building Standards Commission that we believe these three amendments to be reasonable, limited in scope and effect, applicable equally to all building materials industries, and affecting only a few percent of the buildings actually built in California. In short, they represent a small to moderate effect with no negative economic impact from today’s construction and building economy.

The bulk of reasoning behind our proposal for amending the model code is as follows:

1. **California Demographics:** The purpose of the OSFM is to protect people. We must consider who those people are and what their specific needs are in order to adequately protect them. The state population projections show an increasing percentage of residents with special needs such as age concerns, disabilities, and non-English speaking concerns.

Some basic facts about California’s unique social conditions should be stated. These are (US Census 2000):

- Age
 - Total state population in 2000 was 34 million
 - Total state population projected for 2030 is 46 million
 - 42% of population will be under age 17 or over age 65 in 2025
 - Non-English Speaking
 - 40% speak another language at home, with 3.3 million speaking little to no English
 - Disabled
 - 18% of the total population has some type of disability
 - 11.5% are Severely Disabled
 - These statistics are expected to grow as both supportive technology and age segments grow.
2. Natural Hazards - California is a significant natural hazard state. The IBC does not adequately address our regional seismic, wind, and wildfire frequency of occurrence. This is not a criticism, just a reflection that this is our problem, not the nations and we must ensure the code reflects our unique conditions.
 3. Sprinkler Reliability – Two issues cause the OSFM concern in regards to placing the same reliance on sprinklers that the model code does. First is the national estimate of an overall reliability rating of 89%. This means that one fire in ten will not be effectively controlled by the primary method of protection. Second is that seismic events both spark ignitions and compromise sprinkler mechanical and water supply systems, all while overwhelming the emergency response system with rescue demands.
 4. Fire Department Operations – The IBC states as a goal the consideration of firefighter safety along with the occupants and the need to design buildings to facilitate fire rescue and suppression demands. Yet no firefighter sits on the IBC Development Committee and there is insufficient understanding of what firefighters face when they are inside a building performing rescue and suppression. The OSFM worked directly with firefighters in analyzing the impacts of larger buildings on fire resources, tactics, and safety. We also ran through a response scenario for the R-2 occupancy. Their comments are summarized as:

“Time is the enemy. Bigger buildings without compartmentalization require more firefighter’s on-scene, more potential for getting lost while interior, more need for air support.”

“Smoke is a significant problem, even when there are sprinklers there’s a lot of smoke. In fact, sprinklers drive the smoke lower in the building and makes rescue more complicated. Smoke inhalation and disorientation are a big problem and firefighters must combat this even with sprinklers”.

“We use area separation walls for tactical control points, without them we will have to take more defensive tactics and may not go inside if the fire is well-seated”.

Overall, the operational input was that sprinklers are great but that they aren’t always effective. When that happens, the fires we may be facing with the IBC heights and areas may be more difficult to extinguish than those we are currently staffed and trained to fight. Even when sprinklers do work, there is interior rescue, evacuation, and firefighting still to do.

Sprinkler Reliability

Sprinklers are a highly effective tool for controlling fires. They are one of the primary reasons that fire death and losses in America have declined over the past three decades.

The IBC acknowledges this success and relies on it heavily as it formulates a layered fire protection strategy. A total of 493 sprinkler trade-offs are allowed to all facets of building requirement (as compared to 225 in the UBC, 1997) from the controversial heights and areas allowances to smoke control to reduced exit widths. The net effect of this has been to encourage a wider, voluntary usage of sprinklers by builders since their use is cost-neutral or positive due to the trade-offs.

Yet a couple of troubling facts question whether this is an appropriately scaled approach. First is sprinkler reliability. Reliability is broken into two categories:

Operational Reliability is the probability that a system or component will operate as intended when needed.

Performance Reliability is the measure of the adequacy of a system once it has operated to control a fire.

Sprinklers are usually designed to control a fire rather than extinguish it. This means that when a fire starts, heat activates the sprinkler head, water flows and the fire is kept to a small size. The fire continues to burn although not spread rapidly. When firefighters arrive, the fire is still producing smoke and gases, evacuation and/or rescue is still required, and fire suppression is still required. The value of sprinklers is that if all works correctly, these are manageable events rather than rapidly spreading, uncontrolled events.

Several attempts at quantifying sprinkler reliability have been attempted and the most recent professional, published analysis supports a reliability average value of 89%. (Reliability of Automatic Sprinkler Systems, William E. Koffel, P.E., September 2005) This number represents a middle ground of the values being debated within the fire protection design system, and the OSFM feels it is a fair and supportable value. (See Appendix C – Reliability of Automatic Sprinkler Systems)

This 89% value means that roughly one fire in ten in a sprinklered building will escape the control of the designed, primary fire suppression system. When this occurs, the remaining back-up systems of compartmentalized area and firefighters then become the primary mechanisms of control. Recent anecdotal examples of this include: (Round Table/White Paper Presentation – Society for Fire Protection Engineers Symposium 2006, “Is the International Building Code Meeting Its Intent of Protecting Firefighters?”.)

- In 2004, a 240,000 sq ft auto parts distribution center caught fire, the fire overwhelmed the sprinkler system and it was the single largest loss of U.S. property that year.
- In Texas, a 100 Unit apartment building suffered \$11 million in fire damage when the sprinklers had been shut down due to a leak.
- In Maryland, an historic Court house suffered \$8 million in damage, sprinklers were present but there was no report on their effectiveness

Another significant concern with sprinkler reliability is the recent discovery of several faulty sprinkler head designs that have generated recall notices. In the past 15 years, nearly 50 million sprinkler heads have been recalled. This represents a significant issue when calculating the overall reliability of sprinkler systems.

Other reasons sprinkler systems may not function as designed and planned include human intervention such as shutting the system down manually and forgetting to turn it back on, 'contents'- driven fires that are hotter than the sprinklers were designed for, arson, and the biggest concern: seismic ground shaking that disables the water supply system itself.

Taken as a whole, the reliability factor of sprinklers leads the OSFM to conclude that a more conservative, layered fire protection approach to buildings with the higher risk occupancies is warranted.

Natural Hazards: Seismic

California's seismic hazards hardly need describing to the Building Standards Commission. This document will focus on the effect of seismic occurrences to buildings and fires, and the emergency response system.

Seismic events do three things simultaneously related to our concerns:

1. They disrupt the water supply and damage the sprinkler systems.
2. They cause ignitions from a variety of sources.
3. They overwhelm the emergency response system instantly and on a large-scale.

In the Northridge Earthquake, there were 100 ignitions immediately after the ground shake with 30-50 significant fires. The Loma Prieta Earthquake disabled water supplies around the Bay Area, most notably in San Francisco where the fire department had to pump water from the bay to fight fire.

Recently released studies by CalTech in August, 2006 describe building collapse of greater magnitude than predicted, even under modern building codes. The United States Geologic Survey calculates probability of earthquake occurrence and predicts a 62% probability that a 6.7 magnitude or greater quake in the Bay Area in the next 25 years. Remember Northridge was 6.6, and Loma Prieta measured 6.9.

One report from the Association of Bay Area Governments predicts:

This earthquake scenario has the potential to cause severe damage to public infrastructure throughout the Bay area, including fire stations and hospitals. A Bay area magnitude 6.7 earthquake may expose 2,970 fire, police and local government buildings to violent shaking. Additionally, 76 hospitals will be exposed to the same level of shaking (ABAG).

Additionally, the Southern California Earthquake Center predicts 80-90% probability of a 7.0 magnitude quake in Southern California before 2024.

This type of damaging urban earthquake usually causes gas line breaks and electrical shorts, resulting in structure fires. Fire fighting capabilities are severely hampered by water pipe, water tank and roadway damage, along with roadway congestion. The potential for conflagration is significant.

With damaged fire sprinkler systems, limited water supply and severely impacted fire service response, the last line of defense is the building's passive fire suppression components. Even without water or a single on-scene firefighter, the spread of fire may be slowed and potentially contained, by building components such as fire separation walls and fire resistive construction.

(California) Building and Fire codes have advanced incrementally over the past 80 years, primarily triggered by various earthquake and fire disasters. These advances have consistently balanced active and passive fire suppression capabilities. As a result, the current existing building stock, constructed over the past 80 years and serving over 35 million inhabitants, has a balanced and proven fire suppression capability.

The model building code as currently written has a heavy dependence on a functioning fire sprinkler system. This dependence is excessive, particularly in a very seismically active state such as California.

Statistical Relevancy

Much of the opposition about the proposals to amend the Height and Area sections of the IBC centers on the need for statistical data relative to loss history. At both the national and state level, this is not possible. The unfortunate fact is that the National Fire Incident Reporting System (NFIRS) is a voluntary data entry system and complex, and not widely used by fire departments. In California, we have 960 fire departments and in the past 5 years, only 24% have reported to NFIRS consistently. This is a problem we intend to address over time.

Fire departments around the country are the data entry points and their participation is required only if they wish to receive federal grant money. The result is that the body of data to clearly demonstrate the conclusions we seek about the effect of building height and area on life and property loss is non-existent or inconclusive.

It is important to remember that this applies equally to both the current height and area values as well as proposed changes. For this task, statistical analysis will not yield the answers we seek and professional knowledge and experience must guide the decision-making.

Other State Height and Area Amendments

Another issue cited in the opposition to amending the Height and Area provision is that no one else has done it. Ten other states have modified the sections at issue, although none in the exact same manner as California. It should be noted however, that Building Officials Association of Florida submitted Height and Area code proposals at the national hearings that were very similar to California's, as did the National Association of State Fire Marshal's.

The following has been determined from our review of several states; nine have made alterations *other than* editorial changes in these sections and elsewhere, which have significant implications on height and area requirements of the IBC. Along with this, New Jersey is making significant changes in adopting the 2006 IBC. Massachusetts has also made significant changes that will be effective within its borders when it places the IBC in force for the first time. However, none of these changes appear to be as comprehensive as proposed for the CBC. States with significant amendments are highlighted below.

Alaska:

No changes to Chapter 5 but an appendix "L" added to address construction of buildings for North Slope oil production. This section appears a bit odd in that it seems to be a requirement and not an advisory section from the text.

Florida:

Text and content changes - 504.1, 504.2, 506.3

Kentucky:

Text and content changes – 506.3

Massachusetts:

Changes In areas for sprinkler systems – 506.3

Changes In allowable areas for multistory buildings - 506.4 and Table 503

Maryland:

Changes to 504.2

New Hampshire:

Significant content changes to Table 503 + others

New Jersey:

Changes to Table 503 + changes to remain “consistent with BOCA” [see Comment No. 14. pp 8 of NJ Community Affairs Digest]

New York

Some changes to table 503, editorial to 506.3, 506.4

Washington –

Amends Sections 503 and 506 to create significant differences from the IBC Model Code

4. Providing Reasonable Solutions

The concerns raised by the OSFM relative to the model code need focused, reasonable solutions. We are fully aware of the need for a balanced approach to these risk concerns and also support moving forward with a model code that may be a better solution than the older ones. However, we feel that the jury is still out on many of the basic tenets of the IBC, and while it may fully and adequately address public fire and life risk issues, firefighter safety and operations, and reliance on active sprinkler-based protections systems, there is also a distinct possibility it could use improvement.

For this reason, we are proposing to allow an unamended IBC for those occupancies that constitute primarily a property loss risk as opposed to a life risk. Our amendments focus on those high-life risk occupancies only. In addition, our amendments support the conclusions of the IBC but do not extend the full area and height allowances in the modifications sections.

We did not amend Table 503 – Base Tabular Values. We did not remove any sprinkler allowances; we did not reduce the heights of the buildings. Instead we:

- Allow height or area increases, but not both.
- Remove the ability for R occupancies to extend to 4 stories in height with un-sprinklered attic spaces for wood construction types (same as CBC).
- Allow the 200% building area increase modifier but not the 300% one.

Again, these amendments do not affect all occupancies. They will affect only the high-life risk ones of Assembly, Educational, Institutional, Residential, Hazardous and High-rise. This means that the majority of California construction will be completely unaffected by our proposals (unless amended locally). And for those buildings that are affected, we believe the effects will be to allow buildings slightly larger than today's CBC. For those buildings that are affected by the amendments the economic impacts should be negligible compared to today's construction costs. We do acknowledge that the anticipated reduction in construction costs or increases in market share that some industries may have looked forward to will not be as great as the model code predicted. *However, we do not anticipate cost increases from today's environment.*

We strongly believe this is a focused, reasonable approach to the protection of fire and life safety and represents an acknowledgement of the value of the model code while treating the higher risk occupancies more conservatively due to California's unique conditions.

Economic Considerations

Below is a table outlining the construction market in California according to the Construction Industry Research Board, 2005 data. Obtaining construction data by occupancy type in California requires a city-by-city permit search which is beyond the scope of this office. However, CIRB provides equivalent data in general occupancy categories tabulated by dollar value. This gives us an accurate, general picture of the market and allows us to analyze the impact of the SFM amendments on total construction.

It is clear that the greatest construction market segment belongs to the residential sector with 57% attributed to the Single Family Dwelling category. Second in size is the R-2, Multi-Tenant Dwelling segment with 20 % of the total market. Finally, other occupancies addressed in our amendments fall into the R-1/A-2 category which comprise 1% of the construction volume.

It is estimated that even conservatively including the entire Office/B category (in the event it is a high-rise building), the SFM amendments will only affect 24% of the total market and that is primarily attributable to the R-2 impact. Yet the impact is negligible for the following reasons.

The R-2 construction market in California today is geared toward the land values, architectural and community design standards, and codes we have in place today. It is estimated that the number of 4-story apartment units in California comprise less than 10% of the total of all apartments, so translated this means that the vast majority (90%) of R-2 construction in state today is 2 or 3-story, NFPA 13 or 13R sprinklered, Type V-A (1 HR) construction. Our amendments still allow the same style of construction to continue without change. (Cost Estimate per sq ft is \$86.83 per Building Safety Journal, August 2006 - uncorrected for California.)

The three height and area amendments will impact R-2 construction only if the applicant requests to apply the height or area increases over the base allowances. In that case, the applicant can select to upgrade to a full NFPA 13 sprinkler system for height or area increases, or construct fire walls for every 90,000 sq ft. (an increase of 6,000 sq ft compared to our present California Building Code). Today, with the same design request under the CBC, the applicant would be required to do everything the same but erect fire walls (area separation walls in the CBC) at only 84,000 sq ft. Our amendments allow a small increase over today's requirements and still allows for the same number of stories.

If we did not amend this section, we could be left with a wood built apartment building, 4 stories in height with an un-sprinklered attic and nonhabitable rooms and areas (elevator machine rooms, penthouse equipment rooms, crawl spaces) that are beyond the reach of fire department ground ladders of 24 to 35 feet. We believe this is not prudent given all of the risk considerations outlined in this document.

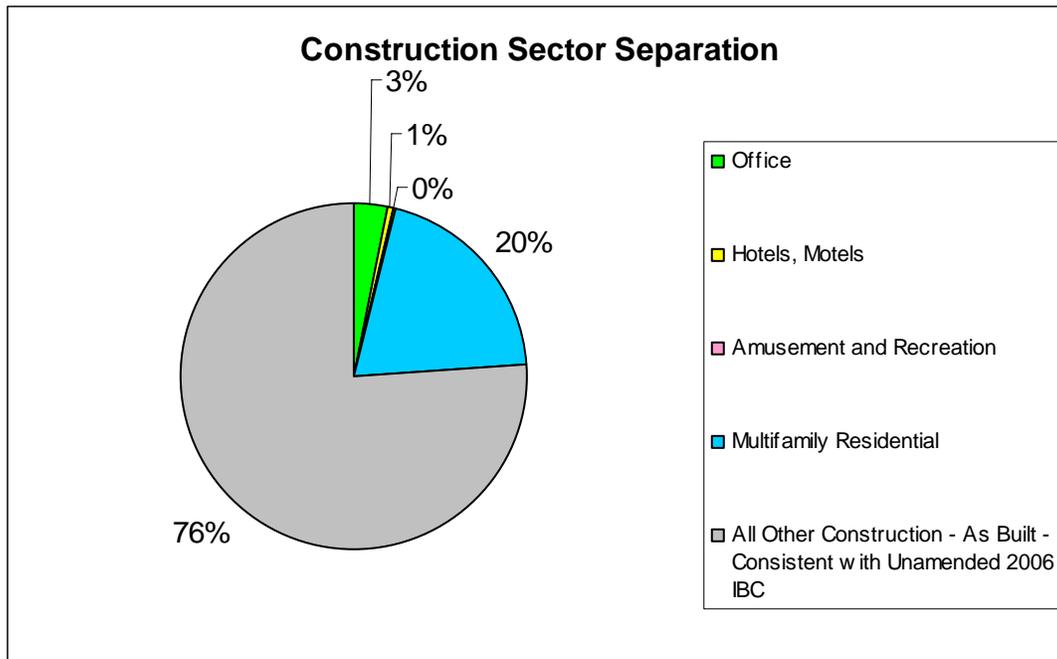
A search of the ten largest non-residential construction projects in California in 2005 show that only two of the ten would be directly affected by the proposed OSFM amendments – a pharmaceutical manufacturing facility and a hotel for a total project value \$252 million out of a total 'all construction' value of \$ 14.4 billion. (See Appendix D – Ten Largest Construction Projects 2005)

Finally, it is very important to note that the California residential industry supports this package. The National Multi-Housing Council submitted a letter of opposition, but other national residential groups have not. We believe the most affected parties, the California commercial residential builders and owners, are satisfied that our proposals are reasonable and economically neutral. (See Appendix E – How will the changes to the 2006 International Building Code proposed by the California Office of the State Fire Marshal [OSFM] effect R-2 building costs)

Building Configurations Issues

Cost Impact

Non Residential Sector		2005 Construction Dollars from Permit Valuations, Billions of Dollars	Percent of total (%)
Component	Occupancy		
Industrial	F	1.693	3
Office	B	1.881	3
Stores	M	2.928	5
Hotels, Motels	R-1	0.384	1
Parking Garages	S-1	0.437	1
Amusement and Recreation	A-2	0.165	0
Alterations - Non Residential		6.901	11
Total Non Residential - <u>selected</u> segments		14.389	23
Residential Sector			
Multifamily Residential	R-2	12.26	20
SFD Residential	R-3	34.88	57
Total State-Wide Construction From CIRB Data		61.529	100



Reference: Construction Industry Research Board, 2006. "Building Permit Summary: California Cities and Countries Data for Calendar Year 2005." Burbank, California.

5. Final Recommendation

California is a leader in the fire and life safety professions. Our building and fire officials are some of the nation's best and speak with considerable experience. We strongly believe the OSFM proposals continue this reputation and allow for change and overall improvement of our building community while at the same time, taking a more conservative approach than the model code in the high risk occupancies.

Reasons supporting this recommendation are numerous.

1. The variety and frequency of natural disasters require greater care and consideration than the model code provides. 75% of the nation's earthquake risk is located In California and we must address this risk though this amendment process.
2. Vulnerable and special need populations are growing and require higher levels of protection than we commonly think of with able-bodied, English-speaking adults.
3. Sprinkler fire protection systems are the best, first defense against life and property loss but are not infallible. Layered fire protection is the appropriate risk mitigation approach.
4. Our life loss history In California continues to need improvement as does firefighter safety. Too many people still die in preventable, mitigable fires.
5. The OSFM is charged with setting the fire and panic standards for California and has done so with an open, participative, researched and professional process for this adoption.
6. The impact of our amendments is not far-reaching or overly restrictive. They are reasonable, focused, limited to those buildings with the greatest risk of life loss, and economically neutral.
7. This package has widespread support of the fire service, building officials, industry, other state agencies, and stakeholders. Any remaining voices of opposition come from primarily specific out-of-state interest groups. The OSFM continues to work with these stakeholders to educate and find common ground as we have done throughout this past year.
8. Adoption of this package will allow for the quickest, smoothest implementation possible of the CBC. Local amendment processes will be minimized and the CBC will be a more consistent document than if these issues were addressed by individual jurisdictions.

The OSFM thanks you for your extraordinary commitment of time to this goal. The Building Standards Commission has performed above and beyond the call.