

**Reason:** Currently the only hint that the code user has in Chapter 5 that the height and area limitations in Sections 508 and 509, and Chapter 4 are allowed is found in the 1<sup>st</sup> sentence in Section 503.1, which states “The height and area for buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits in Table 503 except as modified hereafter.”

Nowhere in Chapter 5 specifically is there a connector to Chapter 4 which contains many modifications to the heights and areas allowed by Table 503, e.g., covered mall buildings, high-rise, etc.

The proposed language is intended to make it clear the term “hereafter” not only refers to those items in Sections 503.1.1 through 503.1.3 and Sections 504 through 509, but also refers to those provisions found in Chapters 4 and 5 which are modify the heights and areas allowed by Table 503.

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

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

---

## G110–06/07

### 503.1

**Proponent:** Philip Brazil, PE, Reid Middleton, Inc., representing himself

**Revise as follows:**

**503.1 General.** ~~The height and area for of a buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each part portion of a building included within the exterior walls or the exterior walls and fire walls where provided separated by one or more fire walls complying with Section 705 shall be permitted considered to be a separate building.~~

**Reason:** The purpose of the proposal is to establish technically sound charging language for the provisions of Section 503. The current language references buildings of different construction types but not buildings of a single construction type. Section 602.1 requires buildings to be classified into a single construction type. Section 503, however, is silent on buildings complying with Section 602.1. Section 705.1 permits portions of a building separated by fire walls to be considered as separate buildings. This, in turn, provides the option of classifying portions of buildings separated by fire walls into different types of construction. Section 503, however, is also silent on buildings complying with Section 705.1. Section 503 limits the height and area of a building with different types of construction by reference to Table 503. Table 503, however, is silent on its application to buildings with different types of construction.

Section 503.1 permits a portion of a building included within the exterior walls or the exterior walls and fire walls to be a separate building. A portion of a building included within the exterior walls is not a portion of a building but is the entire building. Permitting a portion of a building separated by one or more fire walls to be a separate building challenges the laws of physics. A portion of a building separated from the remainder of the building by a fire wall is still a portion of a building but it can be considered as a separate building for the purposes of compliance with the IBC when the fire wall complies with Section 705.

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

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

---

## G111–06/07

### 503.1, 503.1.4 (New)

**Proponent:** Sarah A. Rice, Schirmer Engineering Corporation

**Revise as follows:**

**503.1 General.** The height and area for buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits in Table 503 except as modified by Sections 503.1.1 through 503.1.4 and Sections 504 through 509 hereafter. Each part of a building included within the exterior walls or the exterior walls and fire walls where provided shall be permitted to be a separate building.

**503.1.1 Special industrial occupancies.** Buildings and structures designed to house special industrial processes that require large areas and unusual heights to accommodate cranes or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the height and area limitations of Table 503.

**503.1.2 Buildings on same lot.** Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the height of each building and the aggregate area of buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

**503.1.3 Type I construction.** Buildings of Type I construction permitted to be of unlimited tabular heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited height in Sections 503.1.1 and 504.3 or increased height and areas for other types of construction.

**503.1.4 Special uses and occupancies.** Buildings and structures of those special uses and occupancies found in Chapter 4 that require unusual heights and areas, shall be exempt from the height and area limitations of Table 503 to the extent prescribed in Chapter 4.

**Reason:** Currently the only hint that the code user has in Chapter 5 that the height and area limitations in Sections 508 and 509, and Chapter 4 are allowed is found in the 1<sup>st</sup> sentence in Section 503.1, which states "The height and area for buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits in Table 503 except as modified hereafter."

Nowhere in Chapter 5 specifically is there a connector to Chapter 4 which contains many modifications to the heights and areas allowed by Table 503, e.g., covered mall buildings, high-rise, etc.

The proposed language is intended to make it clear the term "hereafter" refers to those provisions found elsewhere in Chapters 5 and that the modifications in Chapter 4 to the heights and areas allowed by Table 503 is recognized.

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

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

---

## G112-06/07

### 503.1.2

**Proponent:** Sheldon Rucinski, Schirmer Engineering Corporation

**Revise as follows:**

**503.1.2 Buildings on same lot.** Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the height of each building and the aggregate area of buildings are within the limitations of Section 402 or Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

**Reason:** A new trend is emerging in the area of covered malls, commonly referred to as "towne centers" or "life style centers." For all intense purposes these are look and smell just like any covered mall building out there with the exception that the common pedestrian area is "uncovered" to allow the occupants to experience the outside.

The recognition of covered mall buildings to the concept of buildings on the same lot, will allow for these designs. All other provisions in Section 402 will still apply, e.g., type of construction, open yard, fire alarm, sprinkler, etc.

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

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

---

## G113-06/07

### 504.2

**Proponent:** Rick Thornberry, P.E., The Code Consortium, representing the Alliance for Fire and Smoke Containment and Control (AFSC)

**Revise as follows:**

**504.2 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~~ This increases are shall be 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. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

**Reason:** The purpose of this proposed code change is to delete the 20 foot height increase allowed when an automatic sprinkler system is installed throughout the building. This would apply not only to NFPA 13 sprinkler systems, but also to NFPA 13R sprinkler systems for Group R occupancies. This issue has come to our attention after our participation in the California State Fire Marshal's code review and evaluation process set up for the adoption of the 2006 International Building Code (IBC). During a very thorough review conducted by the Height and Area Study Group, it was discovered that the 20 foot height increase for automatic sprinkler systems allows for taller buildings than any of the three legacy model building codes allowed with a few minor exceptions. Both the 1997 ICBO Uniform Building Code (UBC) and the 1999 SBCCI Standard Building Code (SBC) allowed the identical building heights for their comparable types of construction with the exception of IBC Type IB construction (IBC Type II – F.R. and SBC Type II) for which the UBC allowed the same height as the IBC of 160 feet as compared to 80 feet in the SBC. A maximum height of 120 feet was allowed in the 1999 BOCA National Building Code (NBC) for their comparable construction Type 2A.

However, for the lesser types of construction the BOCA NBC generally did not allow higher building heights even with the 20 foot height increase for automatic sprinklers (the BOCA NBC was the only legacy model building code that allowed for the 20 foot height increase for automatic sprinklers) than the maximum building heights allowed by the IBC without the 20 foot height increase for automatic sprinklers.

For the Committee's information, we have provided a table which compares the IBC construction types with the BOCA NBC construction types and shows the height limit allowed by the IBC without an automatic sprinkler increase of 20 feet and the BOCA NBC maximum height allowed with an automatic sprinkler increase of 20 feet. The final column to the right shows the maximum height allowed by the IBC with an automatic sprinkler system increase of 20 feet for an additional comparison.

A review of the table clearly shows that only in a very few limited cases would the BOCA NBC with the 20 foot height increase for an automatic sprinkler system allow building heights for specific types of construction and occupancy combinations to be as high as the IBC allowable height with the 20 foot sprinkler increase. For the vast majority of cases, however, for other than Type V construction, the BOCA NBC with the 20 foot sprinkler height increase allowed at most only a 5 foot increase, in effect, above that allowed by the IBC without the 20 foot height increase for automatic sprinklers. Where an occupancy group is not shown in the table, that means the maximum allowable height by the BOCA NBC with the 20 foot sprinkler height increase included did not even exceed the maximum allowable height permitted in Table 503 of the IBC without the 20 foot height increase for automatic sprinklers. Thus, the IBC is allowing buildings to be built taller than they were ever allowed to be built by any of the three legacy model building codes prior to the IBC. We are not aware of any technical justification provided during the ICC drafting process to justify this extra height increase. So it is very likely that there has been very little fire experience throughout the country to provide data that may indicate if the extra 20 foot height increase is acceptable and does not cause an adverse impact on fire and life safety.

Increasing the allowable building height 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 such as in California 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 currently allowed by the UBC. This will certainly result in more property damage and more risk for the building occupants, as well as the fire fighters who have to respond to an uncontrolled fire in such buildings.

In conclusion, we believe it is inappropriate to retain the 20 foot height increase currently allowed for the installation of an automatic sprinkler system by Section 504.2 since there is no apparent technical justification to allow the increase above the maximum height levels allowed by virtually any of the previous legacy model codes. Without such technical justification why should the IBC be part of a grand experiment to determine what impact such a height increase will have on the building's overall fire and life safety in communities that adopt the IBC where they have never allowed such heights before?

Construction Type				Height Limit (FT)	
IBC	NBC	IBC*		NBC**	IBC**
IIA	2B	65'	B	85'	85'
				F-1	70'
				F-2	85'
				H-3	70'
				H-4	85'
				I-1	70'
				M	70'
				R-1	70'
				R-2	70'
				R-3	70'
				S-1	70'
				S-2	85'
IIB	2C	55'	B	60'	75'
				F-2	60'
				H-4	60'
				I-1	60'
				R-1	60'
				R-2	60'
				R-3	60'
				S-2	60'
IIIA	3A	65'	B	70'	85'
				F-2	70'
				H-4	70'
				I-1	70'
				R-1	70'
				R-2	70'
				R-3	70'
				S-2	70'
IIIB	3B	55'	B	60'	75'
				F-2	60'
				H-4	60'
				I-1	60'
				R-1	60'
				R-2	60'
				R-3	60'
				S-2	60'
IV	4		65'	B	85'
				F-1	70'
				F-2	85'
				H-3	70'
				H-4	85'
				I-1	70'
				M	70'
				R-1	70'
				R-2	70'
				R-3	70'
				S-1	70'
				S-2	85'
VA	5A	50'	B	60'	70'
				F-2	60'
				H-4	60'
				I-1	60'
				R-1	60'
				R-2	60'
				R-3	60'
				S-2	60'
VB	5B	40'	B	50'	60'
				F-2	50'
				H-4	50'
				I-1	55'
				R-1	55'
				R-2	55'
				R-3	55'
				S-1	50'
				S-2	50'

\*without 20 foot sprinkler increase

\*\*with 20 foot sprinkler increase

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

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

# G114-06/07

## 504.2, 506.3

**Proponent:** Rick Thornberry, P.E., The Code Consortium, representing the Alliance for Fire and Smoke Containment and Control (AFSC)

### Revise as follows:

**504.2 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 shall be 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:** The maximum height and maximum number of stories increases shall not be permitted for the following conditions:

1. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.
4. Buildings of Type IIB, IIIB, or VB construction where the area increase permitted by Section 506.3 is used.

**506.3 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 shall be 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 Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the floor area of an occupancy in Use Group H-2 or H-3. For mixed-use buildings containing such occupancies, the allowable area shall be calculated in accordance with Section 508.3.3.2, with the sprinkler increase applicable only to the portions of the building not classified as Use Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.
4. Buildings of Type IIB, IIIB, or VB construction where the height and story increases permitted by Section 504.2 are used.

**Reason:** The purpose of this code change proposal is to eliminate the current allowance in the code that permits both a height increase in stories and feet, as well as an area increase where an automatic sprinkler system is installed in buildings constructed of the non-rated types of construction, i.e. Types IIB, IIIB, and VB. We have focused in on the non-rated types of construction since we believe they pose the greatest challenge to fire and life safety should they experience a fire. If such buildings are allowed to take advantage of both the height and area increase for the installation of an automatic sprinkler system, they will be subject to greater fire losses should the sprinkler system not operate as designed. Since an automatic sprinkler system is not 100 percent foolproof, we believe this is an over reliance on the use of that sprinkler system to allow for these significant increases in the building heights and areas. These buildings have basically no built-in passive fire-resistive protection so that a fire that gets out of control could readily spread to multiple stories and cause early collapse of the building construction. It has been well documented that automatic sprinkler systems have a failure performance rate of somewhere in the neighborhood of 10 to 15 percent of all building fires involving sprinklers where the fire was judged to be large enough that it should have activated the sprinkler system.

What is even more disconcerting is that a comparison of the three legacy model codes will show that the utilization of both the height increase and the area increase almost always results in a larger building in both terms of height and area than was previously allowed by those legacy model codes.

Please refer to the example comparing the maximum allowable heights and areas for a Group B office building of Type IIB construction based on the current provisions in the IBC versus the three legacy model building codes. The example also shows what the maximum allowable areas and building heights would be if this code change proposal were approved. One can see that the allowable areas and heights under the current IBC are significantly greater for virtually every case. However, the implementation of the proposed code change indicates that the maximum allowable building areas and heights are generally still greater but not nearly as much.

We have also compiled tables comparing the maximum allowable heights and areas for other occupancies for these non-rated types of construction. Again, they clearly show the significantly larger building areas and heights permitted by the current IBC as compared to the previous legacy model codes for the vast majority of cases. However, this code change proposal will reduce those very large heights and areas so that they wont be nearly as excessive as they currently are. This will result in allowable building heights and areas that are more comparable to those that have been traditionally allowed by the previous legacy model building codes.

*Why is this important? Because we don't have any substantiated fire record for these greatly larger buildings that have not been previously allowed by the legacy model building codes. We can only assume that allowing larger buildings than previously allowed based on the same type of construction for a given occupancy can only result in an increase in fire loss statistics over time as these larger buildings are constructed and occupied and suffer fires over their lifetime. For these reasons, we recommend that this code change proposal be approved as submitted.*

**Example: Group B Office Building**  
**Type IIB Construction**  
**Area Per Story**

	<u>ICC IBC</u>		<u>BOCA NBC</u>		<u>ICBO UBC</u>		<u>SBCCI SBC</u>	
	<u>Area</u>	<u>Height</u>	<u>Area</u>	<u>Height</u>	<u>Area</u>	<u>Height</u>	<u>Area</u>	<u>Height</u>
Base	23,000 s.f.	4 st. 55'	14,400 s.f.	3 st. 40'	12,000 s.f.	2 st. 55'	17,000 s.f.	2 st. 55'
Max.	86,250 s.f.*	5 st. 75'	47,520 s.f.	4 st. 60'	48,000 s.f.	2 st. 55'	51,000 s.f.	5 st. 55'
	51,750 s.f.**				or			
					24,000 s.f.	3 st. 55'		

-----

As Revised by this Proposal

Max.	86,250 s.f.*	4 st. 55'
	64,688 s.f.**	
	or	
Max.	40,250 s.f.*	5 st. 75'
	30,188 s.f.**	

---

**Total Building Area**

Base	69,000 s.f.	4 st. 55'	43,200 s.f.	3 st. 40'	24,000 s.f.	2 st. 55'	34,000 s.f.	2 st. 55'
Max.	258,750 s.f.	5 st. 75'	190,080 s.f.	4 st. 60'	96,000 s.f.	2 st. 55'	204,000 s.f.	4 st. 55'
					or		or	
					48,000 s.f.	3 st. 55'	255,000 s.f.	5 st. 55'

-----

As Revised by this Proposal

Max.	258,750 s.f.	4 st. 55'
	or	
Max.	120,750 s.f.	5 st. 75'

\*Maximum area allowed for any story provided the total building area does not exceed that allowed as indicated below.  
 \*\*Maximum area allowed per story if evenly divided between all the stories allowed.

**Type IIB Construction**

**Maximum Allowable Total Building Area**

(sf)

<u>Occ.</u>	<u>Proposed IBC (2x)</u>	<u>BOCA NBC</u>	<u>ICBO UBC</u>	<u>SBCCI SBC</u>	<u>Existing IBC (3x)</u>
A-2	71,250	16,800 <sup>1</sup>	NP <sup>10</sup>	32,000 <sup>7</sup>	106,875
A-3	71,250	57,960 <sup>2</sup>	54,600 <sup>3</sup>	48,000 <sup>8</sup>	106,875
B	172,500	132,480	96,000	255,000	258,750
E	108,750	99,360	81,000	48,000	163,125
F-1	116,250	66,240	96,000	252,000	174,375
I-1	75,000	77,280	NP <sup>4</sup>	180,000 <sup>9</sup>	112,500
I-2	41,250	25,200	27,000 <sup>5</sup>	40,000	41,250
M	93,750	66,240	96,000	135,000	140,625
R-1/R-2	120,000	88,320	72,800 <sup>6</sup>	180,000	180,000
S-1	131,250	57,960	96,000	192,000	196,875

NP - not permitted

Footnotes:

<sup>1</sup> - BOCA NBC A-2 night club/dance hall

<sup>2</sup> - BOCA NBC A-3 restaurant/library/exhibition hall

<sup>3</sup> - ICBO UBC A-3 having assembly room with occupant load < 300 (no stage)

<sup>4</sup> - ICBO UBC I-2

<sup>5</sup> - ICBO UBC I-1.1

<sup>6</sup> - ICBO UBC requires 1 hour fire resistive construction throughout

<sup>7</sup> - SBCCI SBC Group A large assembly (no stage)

<sup>8</sup> - SBCCI SBC Group A small assembly (no stage)

<sup>9</sup> - SBCCI SBC Group R-4

<sup>10</sup> - ICBO UBC A-2.1 having assembly room with occupant load  $\geq$  300 (no stage)

**Type IIB Construction**

**Maximum Allowable Total Building Height**

(stories/feet)

Occ.	Not Sprinklered				-	Sprinklered			
	IBC	BOCA	ICBO <sup>11</sup>	SBCCI <sup>12</sup>		IBC	BOCA	ICBO <sup>11</sup>	SBCCI <sup>12</sup>
A-2	2/55	1/20 <sup>1</sup>	NP <sup>10</sup>	1/55 <sup>7</sup>		3/75	2/40 <sup>1</sup>	NP <sup>10</sup>	1/55 <sup>7</sup>
A-3	2/55	2/30 <sup>2</sup>	1/55 <sup>3</sup>	2/55 <sup>8</sup>		3/75	3/50 <sup>2</sup>	2/55 <sup>3</sup>	2/55 <sup>8</sup>
B	4/55	3/40	2/55	2/55		5/75	4/60	3/55	5/55
E	2/55	2/30	1/55	1/55		3/75	3/50	2/55	1/55
F-1	2/55	2/30	2/55	2/55		3/75	3/50	3/55	4/55
I-1	3/55	3/40	NP <sup>4</sup>	2/55 <sup>9</sup>		4/75	4/60	NP <sup>4</sup>	5/55 <sup>9</sup>
I-2	1/55	1/20	NP <sup>5</sup>	NP		1/55	1/20	1/55 <sup>5</sup>	1/55
M	4/55	2/30	2/55	2/55		5/75	3/50	3/55	5/55
R-1/R-2	4/55	3/40	2/55 <sup>6</sup>	2/55		5/75	4/60	3/55 <sup>6</sup>	5/55
S-1	3/55	2/30	2/55	2/55		4/75	3/50	3/55	4/55

NP - not permitted

Footnotes:

- <sup>1</sup> - BOCA NBC A-2 night club/dance hall
- <sup>2</sup> - BOCA NBC A-3 restaurant/library/exhibition hall
- <sup>3</sup> - ICBO UBC A-3 having assembly room with occupant load < 300 (no stage)
- <sup>4</sup> - ICBO UBC I-2
- <sup>5</sup> - ICBO UBC I-1.1
- <sup>6</sup> - ICBO UBC requires 1 hour fire resistive construction throughout
- <sup>7</sup> - SBCCI SBC Group A large assembly (no stage)
- <sup>8</sup> - SBCCI SBC Group A small assembly (no stage)
- <sup>9</sup> - SBCCI SBC Group R-4
- <sup>10</sup> - ICBO UBC A-2.1 having assembly room with occupant load ≥ 300 (no stage)
- <sup>11</sup> - ICBO UBC will allow a 1 story height increase or an area increase for an automatic sprinkler system, but not both for the same building
- <sup>12</sup> - SBCCI SBC will allow a 1 story height increase in the unsprinklered column in Table

500, but not an area increase, for an automatic sprinkler system. The sprinklered column in Table 500 generally allows at least a 1 story height increase plus an area increase for an automatic sprinkler system but does not allow the height increase for:

A-1 Large Assembly

A-2 Small Assembly



E - Education

Type VI - Unprotected construction

**Type VB Construction**

**Maximum Allowable Total Building Height**

(stories/feet)

Occ.	Not Sprinklered				Sprinklered			
	IBC	BOCA	ICBO <sup>10</sup>	SBCCI <sup>11</sup>	IBC	BOCA	ICBO <sup>10</sup>	SBCCI <sup>11</sup>
A-2	1/40	1/20 <sup>1</sup>	NP	NP <sup>7</sup>	2/60	2/40 <sup>1</sup>	NP	NP <sup>7</sup>
A-3	1/40	1/20 <sup>2</sup>	1/40 <sup>3</sup>	1/40 <sup>8</sup>	2/60	2/40 <sup>2</sup>	2/40 <sup>3</sup>	2/40 <sup>8</sup>
B	2/40	2/30	2/40	2/40	3/60	3/50	3/40	3/40
E	1/40	1/20	1/40	1/40	2/60	2/40	2/40	2/40
F-1	1/40	1/20	2/40	1/40	2/60	2/40	3/40	2/40
I-1	2/40	2/35	NP <sup>4</sup>	2/40 <sup>9</sup>	2/60	3/55	NP <sup>4</sup>	3/40 <sup>9</sup>
I-2	NP	NP	NP <sup>5</sup>	NP	NP	NP	NP <sup>5</sup>	NP
M	1/40	1/20	2/40	2/40	2/60	2/40	3/40	3/40
R-1/R-2	2/40	2/35	2/40 <sup>6</sup>	2/40	3/60	3/55	3/40 <sup>6</sup>	3/40
S-1	1/40	1/30	2/40	1/40	2/60	2/50	3/40	2/40

NP - not permitted

Footnotes:

500, but not an area increase, for an automatic sprinkler system. The sprinklered column in Table 500 generally allows at least a 1 story height increase plus an area increase for an automatic sprinkler system but does not allow the height increase for:

**Type VB Construction**

**Maximum Allowable Total Building Area**

(sf)

Occ.	Proposed IBC (2x)	BOCA NBC	ICBO UBC	SBCCI SBC	Existing IBC (3x)
A-2	45,000	8,400 <sup>1</sup>	NP <sup>10</sup>	NP <sup>7</sup>	45,000
A-3	45,000	29,400 <sup>2</sup>	36,000 <sup>3</sup>	20,000 <sup>8</sup>	45,000
B	67,500	49,680	64,000	54,000	101,250
E	71,250	50,400	72,800	32,000	71,250
F-1	63,750	33,600	64,000	40,000	63,750
I-1	33,750	28,980	NP <sup>4</sup>	42,000 <sup>9</sup>	50,625
I-2	NP	NP	NP <sup>5</sup>	NP	NP

M	67,500	33,600	64,000	36,000	67,500
R-1/R-2	52,500	33,120	48,000 <sup>6</sup>	42,000	78,750
S-1	67,500	29,400	64,000	24,000	67,500

NP - not permitted

Footnotes:

- <sup>1</sup> - BOCA NBC A-2 night club/dance hall
- <sup>2</sup> - BOCA NBC A-3 restaurant/library/exhibition hall
- <sup>3</sup> - ICBO UBC A-3 having assembly room with occupant load < 300 (no stage)
- <sup>4</sup> - ICBO UBC I-2
- <sup>5</sup> - ICBO UBC I-1.1
- <sup>6</sup> - ICBO UBC requires 1 hour fire resistive construction throughout
- <sup>7</sup> - SBCCI SBC Group A large assembly (no stage)
- <sup>8</sup> - SBCCI SBC Group A small assembly (no stage)
- <sup>9</sup> - SBCCI SBC Group R-4
- <sup>10</sup> - ICBO UBC A-2.1 having assembly room with occupant load ≥ 300 (no stage)

**Type IIIB Construction**  
**Maximum Allowable Total Building Height**  
**(stories/feet)**

Occ.	Not Sprinklered				Sprinklered			
	IBC	BOCA	ICBO <sup>10</sup>	SBCCI <sup>11</sup>	IBC	BOCA	ICBO <sup>10</sup>	SBCCI <sup>11</sup>
A-2	2/55	1/20 <sup>1</sup>	NP	1/55 <sup>7</sup>	3/75	2/40 <sup>1</sup>	NP	2/55 <sup>7</sup>
A-3	2/55	2/30 <sup>2</sup>	1/55 <sup>3</sup>	2/55 <sup>8</sup>	3/75	3/50 <sup>2</sup>	2/55 <sup>3</sup>	3/55 <sup>8</sup>
B	4/55	3/40	2/55	2/55	5/75	4/60	3/55	5/55
E	2/55	2/30	1/55	1/55	3/75	3/50	2/55	2/55
F-1	2/55	2/30	2/55	2/55	3/75	3/50	3/55	4/55
I-1	3/55	3/40	NP <sup>4</sup>	2/55 <sup>9</sup>	4/75	4/60	NP <sup>4</sup>	5/55 <sup>9</sup>
I-2	NP	NP	NP <sup>5</sup>	NP	NP	NP	NP <sup>5</sup>	NP
M	4/55	2/30	2/55	2/55	5/75	3/50	3/55	5/55
R-1/R-2	4/55	3/40	2/55 <sup>6</sup>	2/55	5/75	4/60	3/55 <sup>6</sup>	5/55
S-1	3/55	2/30	2/55	2/55	4/75	3/50	3/55	4/55

NP - not permitted

500, but not an area increase, for an automatic sprinkler system. The sprinklered column in Table 500 generally allows at least a 1 story height increase plus an area increase for an automatic sprinkler system but does not allow the height increase for:

**Type IIIB Construction**

**Maximum Allowable Total Building Area**

(sf)

<u>Occ.</u>	<u>Proposed IBC (2x)</u>	<u>BOCA NBC</u>	<u>ICBO UBC</u>	<u>SBCCI SBC</u>	<u>Existing IBC (3x)</u>
A-2	71,250	16,800 <sup>1</sup>	NP <sup>10</sup>	32,000 <sup>7</sup>	106,875
A-3	71,250	57,960 <sup>2</sup>	54,600 <sup>3</sup>	48,000 <sup>8</sup>	106,875
B	142,500	132,480	96,000	210,000	213,750
E	108,750	99,360	81,000	48,000	163,125
F-1	90,000	66,240	96,000	180,000	135,000
I-1	75,000	77,280	NP <sup>4</sup>	180,000 <sup>9</sup>	112,500
I-2	NP	NP	NP <sup>5</sup>	NP	NP
M	93,750	66,240	96,000	135,000	140,625
R-1/R-2	120,000	88,320	72,800 <sup>6</sup>	180,000	180,000
S-1	131,250	57,960	96,000	192,000	196,875

NP - not permitted

Footnotes:

<sup>1</sup> - BOCA NBC A-2 night club/dance hall

<sup>2</sup> - BOCA NBC A-3 restaurant/library/exhibition hall

<sup>3</sup> - ICBO UBC A-3 having assembly room with occupant load < 300 (no stage)

<sup>4</sup> - ICBO UBC I-2

<sup>5</sup> - ICBO UBC I-1.1

<sup>6</sup> - ICBO UBC requires 1 hour fire resistive construction throughout

<sup>7</sup> - SBCCI SBC Group A large assembly (no stage)

<sup>8</sup> - SBCCI SBC Group A small assembly (no stage)

<sup>9</sup> - SBCCI SBC Group R-4

<sup>10</sup> - ICBO UBC A-2.1 having assembly room with occupant load ≥ 300 (no stage)

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

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

**G115-06/07**  
**504.2, 506.3**

**Proponent:** George Thomas, P.E., CBO, City of Pleasanton, representing the Tri-Chapters Code Committee and Laura Blaul, Orange County Fire, representing the California Fire Chiefs Association

**Revise as follows:**

**504.2 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. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
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.

**506.3 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 Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the floor area of an occupancy in Use Group H-2 or H-3. For mixed-use buildings containing such occupancies, the allowable area shall be calculated in accordance with Section 508.3.3.2, with the sprinkler increase applicable only to the portions of the building not classified as Use 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:** California 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 the California statewide code adoption process, building and fire 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. There appears to be little science behind the table values and formulas and California 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:

- 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 county, 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.
- 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 have resulted after every major seismic event in California, 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, they 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.
- The quantity and capability of emergency response resources is based on the infrastructure and building design that has existed in California, and other 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.
- 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 sprinklers, 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.

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

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

---

## G116-06/07

### 504.2, 506.3, 506.4

**Proponent:** Kate Dargan, Assistant California State Fire Marshal, representing the California Department of Forestry and Fire Protection and the Office of the State Fire Marshal

#### Revise as follows:

**504.2 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. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

These increases shall not be permitted in addition to the area increase in accordance with Section 506.3.

**506.3 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 Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the floor area of an occupancy in Use Group H-2 or H-3. For mixed-use buildings containing such occupancies, the allowable area shall be calculated in accordance with Section 508.3.3.2, with the sprinkler increase applicable only to the portions of the building not classified as Use Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

These increases shall not be permitted in addition to the story increases in accordance with Section 504.2.

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by ~~multiplying~~ modifying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, ~~by the number of stories above grade plane as listed below:~~

1. For buildings with two or more stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
- 3.2. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story

#### Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**Reason:** Revisions to Sections 504.2 and 506.3 are proposed to remove the allowance of the combined height and area increase with automatic sprinklers. Revisions to Section 506.4 are proposed to remove the tripling of the maximum allowable floor areas for building three-stories or taller and substituting the doubling of one story areas for multistory buildings. Furthermore revisions to 504.2 and 506.4 eliminate the allowances for Group R occupancy buildings protected with an NFPA 13R automatic sprinkler system.

To identify a balanced approach to fire protection based on the historical use of height and area provisions and data demonstrate California's minimum requirements for the built environment have safeguarded the public health, safety and general welfare of the occupants and to the property as a whole since the 1920s.

The additional safety provided by an automatic sprinkler system has been acknowledged as justification for either increasing the allowable height of a building by one (1) story or increasing the allowable area beyond the limits established in Table 5-A, but not both. The current code allows both without providing any mitigating protective requirements to balance the increased exposure risk to occupants and safety/rescue responders, as well as property protection.

The reduced sprinkler coverage allowed by NFPA 13R (NFPA 13R exempts concealed spaces such as attics) reduces the effectiveness of fire sprinklers within the most vulnerable occupancy types (Group R) for fire hazard. Furthermore, the IBC does not require any additional protective features to mitigate the increase in potential risk associated with a building that is both taller and larger in area, thereby resulting in a potential decrease in public safety. This section is further amended by removing language which permits additional height and story in Group R buildings equipped with an NFPA 13R (instead of an NFPA 13) fire protection system. While the code requires a full NFPA 13 system for other occupancy groups utilizing section 504.2 for height and story increase, it does not currently require mitigating protective features within R occupancies when utilizing the reduced NFPA 13R system for the same purpose. This amendment will address the unmitigated decrease in fire safety currently allowed by section 504.2.

The current code language allows for a tripling of the allowable floor area, as determined in Section 506.1, for buildings three-stories or taller, even if no sprinklers or other additional fire protection features are integrated into the building design. 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 either sprinklers, type of construction, fire walls, or some combination thereof. Furthermore, the current code language allows for buildings equipped with a NFPA 13 sprinkler system throughout, to observe a maximum allowable floor area equivalent to the area determined in Section 506.1 multiplied by the number of stories. This increase relies solely on an automatic fire extinguishing system, and has 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, or temporary disruptions to sprinkler systems that occur during typical remodeling and tenant improvement projects. A significant proportion of the multi-story buildings constantly undergo tenant improvements, and other activities, that result in modifications to, or disruptions of, automatic sprinkler systems. The disproportional reliance on active fire suppression (fire sprinklers) without added passive resistance significantly reduces life safety.

The California Department of Forestry and Fire Prevention, Office of the State Fire Marshal (OSFM) recognizes and supports 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 automatic sprinkler systems for an increase in height or area but not both. During the current California code adoption process, building and fire officials reviewed data from various sources in an attempt to justify the increased building size of the 2006 IBC over the allowable areas/heights in all three legacy codes. There appears to be little science behind the table values and formulas, OSFM and California code officials involved in this process are not comfortable and can not justify 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:

a. 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 county, 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.

b. 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 have resulted after every major seismic event in California, 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 (TI), 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 system often do not 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.

c. The quantity and capability of emergency response resources is based on the infrastructure and building design that has existed in California, and other 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.

d. 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 either sprinklers, type of construction, area separation walls, or some combination thereof.

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.

This code change also proposes to eliminate the special allowances given for Group R occupancy buildings that are protected with an NFPA 13R automatic sprinkler system as specified in Section 903.3.1.2. Currently, Section 504.2 will allow an increase in the building height of one story and 20 feet where an NFPA 13R sprinkler system is provided as long as the building does not exceed a total height of four stories or 60 feet which is within the scope limitations of the NFPA 13R standard. Furthermore, Section 506.4 allows an area increase for the installation of an NFPA 13R sprinkler system for Group R buildings that are greater than three stories in height. We do not believe it is appropriate to provide for such allowances for the types of construction which in essence lessens the built-in fire-resistive passive protection where an NFPA 13R sprinkler system is installed. NFPA 13R sprinkler systems are primarily provided for life safety. They were developed for that purpose as clearly stated in Section 1.2 of the 2002 edition. It is interesting to quote the Annex A discussion of the purpose of NFPA 13R which states: "Various levels of sprinkler protection are available to provide life safety and property protection. This standard is designed to provide a high, but not absolute, level of life safety and a lesser level of property protection. Greater protection to both life and property could be achieved by automatic sprinklers in all areas in accordance with NFPA 13... it should be recognized that the omission of sprinklers from certain areas could result in the development of untenable conditions in adjacent spaces. Where evacuation times could be delayed, additional sprinkler protection and other fire protection features, such as detection and compartmentalization, could be necessary." We believe that says it all about an NFPA 13R sprinkler system.

However, the intent of the IBC as expressed in Section 101.3 Intent is as follows: "The purpose of this code is to establish the minimum requirements to safeguard the public health, safety, and general welfare... and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations." We believe that allowing the use of an NFPA 13R sprinkler system to increase the size of a building would be counter to the intent and purpose of the IBC. Types of construction are designed to limit the height and area of buildings based on the occupancy and the degree of built-in fire-resistive protection and use of combustible or noncombustible construction materials. Buildings are allowed to get larger in area and taller in height with more fire-resistance built in and the lesser use of combustible construction for the building's structural elements. Therefore, property protection is a critical outcome of the use of types of construction. Of course, type of construction also plays a role in life safety, especially in multi-story buildings, and has an impact on fire fighter safety as well. But an NFPA 13R sprinkler system is basically a partial sprinkler system because the standard does not require sprinklers in many concealed areas including attics. So why should a building protected with an NFPA 13R sprinkler system basically enjoy the same increases as a building more completely protected with an NFPA 13 sprinkler system?

Within the last few years there have been many fires involving buildings protected with NFPA 13R sprinkler systems which have burned to the ground. In most of those cases, the fire was able to get into the unprotected attic space and spread throughout the building and then burn downward, overpowering the sprinkler system. Certainly, allowable increases in height and area are not appropriate for sprinkler systems that can allow a building to be burned to the ground.

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

## G117-06/07

### 504.2, 506.4

**Proponent:** Bob Boyer, Building Officials Association of Florida (BOAF) Code Development Committee, Longwood, FL

#### 1. Revise as follows:

**504.2 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. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

#### Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**Reason:** We do not believe it is adequate fire protection to allow the same construction credits for an NFPA 13R system that the code allows for an NFPA 13 system, plus an increase in story height, plus an additional 20 additional feet in height, plus an area increase for such buildings, plus all the other sprinkler trade-offs for built in fire and smoke protection permitted when a sprinkler system are installed. Although sprinklers are an effective tool, an NFPA 13R sprinkler system is only partial sprinkler system and many areas of the building, including concealed spaces, that will not be protected as they would be with an NFPA 13 system.

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

## G118-06/07

### 504.2, 506.4

**Proponent:** George Thomas, P.E., CBO, City of Pleasanton, representing the Tri-Chapters Code Committee and Laura Blaul, Orange County Fire, representing the California Fire Chiefs Association

#### Revise as follows:

**504.2 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. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exceptions:**

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**Reason:** This code change proposes to eliminate the special allowances given for Group R occupancy buildings that are protected with an NFPA 13R automatic sprinkler system as specified in Section 903.3.1.2. Currently, Section 504.2 will allow an increase in the building height of one story and 20 feet where an NFPA 13R sprinkler system is provided as long as the building does not exceed a total height of four stories or 60 feet which is within the scope limitations of the NFPA 13R standard. Furthermore, Section 506.4 allows an area increase for the installation of an NFPA 13R sprinkler system for Group R buildings that are greater than three stories in height. We do not believe it is appropriate to provide for such allowances for the types of construction which, in essence, lessen the built-in fire-resistive passive protection where an NFPA 13R sprinkler system is installed.

NFPA 13R sprinkler systems are primarily provided for life safety. They were developed for that purpose as clearly stated in Section 1.2 of the 2002 edition. It is interesting to quote the Annex A discussion of the purpose of NFPA 13R which states: "Various levels of sprinkler protection are available to provide life safety and property protection. This standard is designed to provide a high, but not absolute, level of life safety and a lesser level of property protection. Greater protection to both life and property could be achieved by sprinklering all areas in accordance with NFPA 13... it should be recognized that the omission of sprinklers from certain areas could result in the development of untenable conditions in adjacent spaces. Where evacuation times could be delayed, additional sprinkler protection and other fire protection features, such as detection and compartmentation, could be necessary." We believe that says it all about an NFPA 13R sprinkler system.

However, the intent of the IBC as expressed in Section 101.3 Intent is as follows: "The purpose of this code is to establish the minimum requirements to safeguard the public health, safety, and general welfare... and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations." We believe that allowing the use of an NFPA 13R sprinkler system to increase the size of a building would be counter to the intent and purpose of the IBC. Types of construction are designed to limit the height and area of buildings based on the occupancy and the degree of built-in fire-resistive protection and use of combustible or noncombustible construction materials. Buildings are allowed to get larger in area and taller in height with more fire-resistance built in and the lesser use of combustible construction for the building's structural elements. Therefore, property protection is a critical outcome of the use of types of construction. Of course, type of construction also plays a role in life safety, especially in multi-story buildings, and has an impact on fire fighter safety as well. But an NFPA 13R sprinkler system is basically a partial sprinkler system because the standard does not require sprinklers in many concealed areas including attics. So why should a building protected with an NFPA 13R sprinkler system basically enjoy the same increases as a building more completely protected with an NFPA 13 sprinkler system?

Within the last few years there have been many fires involving buildings protected with NFPA 13R sprinkler systems which have burned to the ground. In most of those cases, the fire was able to get into the unprotected attic space and spread throughout the building and then burn downward, overpowering the sprinkler system. Certainly, allowable increases in height and area are not appropriate for sprinkler systems that can allow a building to be burned to the ground.

**Cost Impact:** The code change proposal may result in minor cost increases during construction. However, these revisions may ultimately result in overall cost savings throughout the life of the building due to reduced fire losses.

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

## G119-06/07 505.2

**Proponent:** Ron Nickson, National Multi Housing Council/National Apartment Association

**Revise as follows:**

**505.2 Area limitation.** The aggregate area of a mezzanine or mezzanines within a room shall not exceed one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in



a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.

**Exceptions:**

1. The aggregate area of mezzanines in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 503.1.1 shall not exceed two-thirds of the floor area of the room.
2. The aggregate area of mezzanines in buildings and structures of Type I or II construction shall not exceed one-half of the floor area of the room in buildings and structures equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and an approved emergency voice/alarm communication system in accordance with Section 907.2.12.2.

**Reason:** To allow the option for increased area of a mezzanine permitted with a NFPA 13 sprinkler system to also be allowed with a NFPA 13R sprinkler system. Although it would not be typical for a four-story apartment building to be constructed as Type I or II construction there are times that it may be appropriate and desired. In such cases the allowance for increased area should also be permitted for the NFPA 13R sprinkler system because they provide the same level of safety as the NFPA 13 system does for the mezzanine area being protected.

**Cost Impact:** The code change proposal will decrease the cost of construction.

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

---

## G120-06/07

### 506.3

**Proponent:** Bob Boyer, Building Officials Association of Florida (BOAF) Code Development Committee, Longwood, FL

**Revise as follows:**

**506.3 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~~ 100 percent ( $I_s = 2 \underline{1}$ ) for buildings with more than one story above grade plane and an additional ~~300~~ 200 percent ( $I_s = 3 \underline{2}$ ) 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 Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the floor area of an occupancy in Use Group H-2 or H-3. For mixed-use buildings containing such occupancies, the allowable area shall be calculated in accordance with Section 508.3.3.2, with the sprinkler increase applicable only to the portions of the building not classified as Use Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

**Reason:** By comparing the maximum allowable heights and areas for a Group B office building of Type IIB construction, for example, for the current provisions in the IBC versus the three legacy model building codes, it is apparent that the allowable areas and heights under the current IBC are significantly greater in nearly every case - without technical support as to why such expansion is justified. The implementation of the proposed code change permits the maximum allowable building areas and heights to be generally increased, but not nearly as much, and the values are more compatible with the previous legacy codes.

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

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

---

## G121-06/07

### 506.4, 506.4.1

**Proponent:** George Thomas, P.E., CBO, City of Pleasanton, representing the Tri-Chapters Code Committee and Laura Blaul, Orange County Fire, representing the California Fire Chiefs Association

**Revise as follows:**

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by 2. ~~the number of stories above grade plane as listed below:~~

1. ~~For buildings with two stories above grade plane, multiply by 2;~~
2. ~~For buildings with three or more stories above grade plane, multiply by 3; and~~
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exceptions:**

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**506.4.1 Mixed occupancies.** In buildings with mixed occupancies, the allowable area per story ( $A_a$ ) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all ~~floors~~ stories as calculated according to Section 508.3.3.2 shall not exceed 2 for ~~two-story buildings and 3 for buildings three with two or more stories or higher above grade plane.~~

**Reason:** This code change proposal is actually a companion code change to another code change proposal we have jointly submitted to revise Sections 504.2 and 506.3 regarding allowable height and area increases for the installation of an automatic sprinkler system. Most of our concerns that have been expressed in our supporting statement for that code change proposal also hold true for this code change proposal.

The overall concern we have is that the combination of allowable height and area increases along with the 3x multi-story multiplier of the allowable area for a single floor for buildings greater than 2 stories in height creates extremely large buildings with lesser degrees of fire-resistive protection and more use of combustible construction materials than we have previously been exposed to. This will potentially place a significant challenge on our fire service who must respond to fires in these buildings at some time in their lives. We cannot totally rely upon the automatic sprinkler system to perform as intended since we know through experience that they are not foolproof. In fact, we are familiar with studies that indicate sprinklers have a failure rate in the range of 10 to 15 percent which we feel is unacceptable for such potentially large buildings. We are also concerned here in California because of the possibility of having severe earthquakes which will disrupt the water supplies to the sprinkler systems, as well as potentially damage the sprinkler systems themselves, so they cannot function as designed.

As another facet of our approach to bringing the allowable heights and areas for buildings under the International Building Code (IBC) into more realistic values that we believe we can safely live with, we have also proposed this code change to reduce the 3x multiplier for multi-story building areas to 2x that allowed for a single floor area. This results in an overall reduction of 33 percent of the total building area that is presently allowed by the IBC. This is also what we're used to in California where the code we are currently under, the 1997 ICBO Uniform Building Code (UBC), also utilizes the 2x multiplier for multi-story buildings. Our fire service infrastructure is geared to deal with buildings that are much smaller in size than those that can be constructed in accordance with the current requirements of the IBC. Therefore, it is essential that these large buildings be reduced in size.

Another of our main concerns regarding the generous allowance for increases in allowable areas of multi-story buildings is that it will often result in a building being constructed without any built-in passive fire-resistive protection and with a greater use of combustible materials than would have been the case if the area limits had been lower. Thus, we will end up with more buildings that can potentially be life threatening, not only to the building occupants, but also to the safety of the fire fighters who must enter the buildings to fight the fires that may be out of control by the time they arrive on the scene. And, of course, this will also contribute to more property loss in the long term.

In researching this issue as we worked our way through the California State Fire Marshal's code amendment/adoption process which is currently underway, we discovered that the IBC will allow even larger buildings than any of the previous legacy model codes allowed. We have reviewed a study conducted by the Portland Cement Association which evaluated this very issue of the 3x multi-story multiplier. In the summary of that study the following conclusions were noted regarding a comparison of the three legacy model codes to the IBC. It was concluded that the average of the aggregate allowable floors areas permitted by the IBC exceeded those of the legacy codes by the following percentages:

BOCA NBC	30%
ICBO UBC	152%
SBCCI SBC	102%

Obviously, if the 3x multiplier is reduced to a 2x multiplier, it will impact the three story building as well as those buildings greater than three stories which are currently impacted by the 3x multiplier. The average value differences will drop significantly and fall within a reasonable range for the three legacy model codes. Yet, for the most part, they will still allow greater areas than would have been allowed prior to the IBC.

In conclusion, we feel very uncomfortable with the current area allowances that the IBC permits which allow for buildings to be built larger for the same type of construction and occupancy classification than they would have been allowed to have been built under the previous legacy model building codes. We will be allowing those buildings to be constructed without any knowledge of how they would have performed in the past since they were actually never constructed under any of the previous model codes. Thus, there is no track record to indicate if they have performed to an acceptable level of fire and life safety. Without adequate technical justification to support such large building areas, we believe it is prudent to begin to adjust these allowable areas downward by reducing the multi-story multiplier from 3x to 2x that allowed for a single story building.

**Cost Impact:** The code change proposal may result in minor cost increases during construction. However, these revisions may ultimately result in overall cost savings throughout the life of the building due to reduced fire losses.

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

## G122-06/07

### 506.4

**Proponent:** John C. Dean, the National Association of State Fire Marshals

**Revise as follows:**

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by 2. ~~the number of stories above grade plane as listed below:~~

1. ~~For buildings with two stories above grade plane, multiply by 2;~~

2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exceptions:**

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**Reason:** NASFM proposes a reduction of the total allowable building area from three to two times that allowed for a single floor area based on the calculations of  $A_a$  (allowable area) per floor as determined in Section 506.1.

Two of the three Legacy Codes did not permit an architect to multiply the allowable floor space by a factor of three and the third only addressed this multiplier in limited situations. The National Association of State Fire Marshals (NASFM) understands the economic benefits to developers of being able to construct much larger buildings with less built-in fire-resistance on a defined parcel of land. But the economic benefits to developers do not justify the increased risk to occupants and emergency responders. Nor do they justify the on-going costs to owners and tenants.

Taken together with other provisions of the International Building Code (IBC), the current allowance means that occupancies – including health care facilities, schools, residences and office buildings – may be built taller and larger, with less built-in fire protection. If firefighters must enter a burning building to rescue patients, students, physically challenged or otherwise immobile persons, they now face the prospect of climbing higher and traveling further into hostile conditions. The longer they remain in a burning building, the greater the risk of structural collapse. In addition, our most vulnerable structures – tall buildings – will present challenges that many American fire departments are not equipped to handle. As these buildings are allowed to expand in area and in height, without a corresponding increase in built-in fire resistance, the risks to occupants and emergency first responders grow exponentially. Larger, taller buildings with less built-in passive protection also invite increases in fire load comprising materials that generate higher temperatures much more quickly. Due to the increase in size, coupled with limited fire service resources, tall buildings will be required to sustain themselves for longer periods of time.

Firefighters take responsibility for their own safety. The National Institute of Occupational Safety and Health (NIOSH) has advised fire departments to refrain from sending firefighters into buildings if there are concerns about structural collapse. NASFM concurs with this advice from NIOSH, and encourages fire departments to understand the implications of the fire protection requirements in the IBC.<sup>1</sup> Fire chiefs often bear responsibility for plan review, inspections and fire fighter safety. As a result of the NIOSH advisory, they have little choice but to use what they know about a building to prepare for suppression activities.

It makes little sense to await the loss of life and property before we consider returning to proven safety practices. In fact, “waiting and seeing” begs the question, “How many lives must be lost to justify a return to what we know to be safe?” Our intuitive presumption would be that making buildings larger, both in height and area, with less built-in passive fire resistive protection and the use greater use of combustible materials can only result in greater property loss and the potential for greater loss of life. We all agree that one life lost is one too many. So let us prevent the loss of that one life.

The more responsible policy is to return to the well-tested requirements of the Legacy Codes, so that emergency responders and the persons they are sworn to protect may be confident in the safety of buildings.

<sup>1</sup> NIOSH Alert: Preventing Injuries and Deaths of Fire Fighters due to Structural Collapse. (1999, August). Center for Disease Control & National Institute for Occupational Safety and Health. NIOSH Alert, 99: 146. Retrieved from: <http://www.cdc.gov/niosh/99-146.html>

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

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

## G123–06/07

### 506.4

**Proponent:** Bob Boyer, Building Officials Association of Florida (BOAF) Code Development Committee

**Revise as follows:**

**506.4 Area determination.** The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by 2 ~~the number of stories above grade plane as listed below:~~

1. ~~For buildings with two stories above grade plane, multiply by 2;~~
2. ~~For buildings with three or more stories above grade plane, multiply by 3; and~~
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exceptions:**

1. Unlimited area buildings in accordance with Section 507.
2. ~~The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.~~

**Reason:** This purpose of this code change is to reduce of the total allowable building area from three times to two times for a single floor area based on the calculations of  $A_a$  (allowable area) per floor. The overall volume of the building determined by the allowable area per floor and the allowable number of stories and height of the building is significantly greater in the majority of cases than was allowed by any of the previous model

codes. By limiting the total building area to twice that allowed for a single floor, the volume of the building will be significantly reduced, but will be more in line with the legacy codes in most cases.

The proposed approach of limiting the total allowable building area to twice that allowed for a single floor area is the same as that used in the UBC, and is similar to the approach that was used in the NBC.

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

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

---

## G124-06/07

### 506.4.1, 506.4.1.1 through 506.4.1.1.4 (New)

**Proponent:** Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

**Revise as follows:**

**506.4.1 Mixed occupancies.** In buildings ~~containing with~~ mixed occupancies, the allowable area per story ( $A_a$ ) shall be ~~determined in accordance with the applicable provisions of Section 508.3. based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings and 3 for buildings three stories or higher.~~

**506.4.1.1 Multistory buildings.** The maximum area of a mixed occupancy building with more than one story above grade plane shall be determined in accordance with the applicable provisions of this section.

**506.4.1.1.1 Two stories buildings.** For buildings with two stories above grade plane containing mixed occupancies, the maximum building area shall be based on the sum of the allowable floor areas under consideration as determined in accordance with the applicable provisions of Section 508.3.

**506.4.1.1.2 Three or more stories, nonseparated mixed occupancies.** For buildings with three or more stories above grade plane containing nonseparated mixed occupancies, the maximum building area shall be based on the sum of the three most restrictive allowable floor areas under consideration as determined in accordance with the applicable provisions of Section 508.3.2.

**506.4.1.1.3 Three or more stories, separated mixed occupancies.** For buildings with three or more stories above grade plane containing separated mixed occupancies, the maximum building area shall be based on the sum of the three least restrictive allowable floor areas under consideration as determined in accordance with the applicable provisions of Section 508.3.3.

**506.4.1.1.4 Three or more stories, combination mixed occupancies.** For buildings with three or more stories above grade plane containing a combination of mixed occupancies, the maximum building area shall be based on the sum of the three most restrictive allowable floor areas under consideration as determined in accordance with the applicable provisions of Sections 508.3.2 and 508.3.3.

**Reason:** Section 506.4.1 was introduced into the 2006 IBC. It was intended to address multistory mixed occupancy provisions and was largely based on 2003 mixed occupancy provisions. Most of the language contained in Section 506.4.1 is now redundant due the mixed occupancy reformatting in the 2006 IBC. In fact, allowable area determination procedures for nonseparated and separated occupancies are found in Sections 508.3.2.2 and 508.3.3.3, respectively. Also, Section 506.4.1 tends to oversimplify what is necessarily a complicated process based on the recognition of numerous multistory, mixed occupancy contingencies. This proposal provides currently lacking requirements in this relatively common design condition. Approval of this proposal will clarify current mixed occupancy requirements and provide specific guidance for the determination of allowable area in multistory, mixed occupancy buildings that is currently not contained in the IBC.

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

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

# G125-06/07

## 506.4 (New), 506.1.1, 506.4, 506.4.1

**Proponent:** Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself

**Revise as follows:**

**506.4 Buildings with more than one story.** The total allowable building area of a building with more than one story shall be determined in accordance with Section 506.4. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

**Exception:** Portions of the building not required to be included in the total allowable building area, as specified in Section 506.4.1, shall be permitted to be excluded from the actual aggregate building area.

**506.4.1 ~~506.1.1~~ Basements.** A single basement that is not a story above grade plane need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

**506.4.2 ~~506.4~~ Area determination.** The ~~maximum~~ total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area ~~of the first per~~ story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exceptions:**

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane.

**506.4.2.1 ~~506.4.1~~ Mixed occupancies.** In buildings with mixed occupancies, the allowable area per story ( $A_a$ ) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings and 3 for buildings three stories or higher.

**Reason:** The purpose of this proposal is to organize the technical provisions for determining the total allowable building area in buildings with more than one story in a more logical manner and provide charging language where needed. Section 503.1 establishes the allowable building height and the allowable area per story ( $A_a$ ) by reference to Table 503. Section 506.1 determines increases in the allowable building height and allowable area per story ( $A_a$ ) through application of the provisions in Section 506.2 for frontage and Section 506.3 for automatic fire sprinkler systems.

Section 506.1.1, which is a continuation of Section 506.1, exempts a single basement from being included in the total allowable area. The meaning of "total allowable area" is not clear but, presumably, it is a reference to the total allowable building area in buildings with more than one story. Section 506.1, however, is not applicable to the total allowable area. The provisions for determining the total allowable building area are found in Section 506.4.

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

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

---

# G126-06/07

## 506.4.1

**Proponent:** Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself

**Revise as follows:**

**506.4.1 Mixed occupancies.** In buildings with mixed occupancies with two or more stories above grade plane and containing two or more occupancies shall comply with the following:

1. Where all of the occupancies are nonseparated occupancies in accordance with Section 508.3.2, the allowable area per story ( $A_a$ ) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2; determined in accordance with Section 508.3.2.2.
2. Where all of the occupancies are separated occupancies in accordance with Section 508.3.3, the allowable area per story ( $A_a$ ) shall be determined in accordance with Section 508.3.3.2.
3. Where some of occupancies are in accordance with Section 508.3.2 and the remainder are in accordance with Section 508.3.3, the allowable area per story ( $A_a$ ) shall be such that the sum of the ratios of the actual areas of the separated occupancies and nonseparated occupancies divided by the allowable areas of the corresponding occupancies shall not exceed 1 at each story.
4. ~~When~~ Where all of the occupancies are treated according to Section 508.3.3 as separated occupancies in accordance with Section 508.3.3, the maximum total allowable building area shall be such that the sum of the ratios for each such of the actual area of each occupancy divided by the allowable area of each occupancy, or at all floors stories included in the total allowable building area, as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings with two stories above grade plane and 3 for buildings with three or more stories or higher above grade plane.
5. Where some of occupancies are in accordance with Section 508.3.2 and the remainder are in accordance with Section 508.3.3, the total allowable building area shall be such that the sum of the ratios of the actual areas of the separated occupancies and nonseparated occupancies divided by the allowable areas of the corresponding occupancies, at all stories included in the total allowable building area, shall not exceed 2 for buildings with two stories above grade plane and 3 for buildings with three or more stories above grade plane.

**Reason:** The purpose of this proposal is to establish technically sound provisions for the determination of allowable building area in a building with more than one occupancy and more than one story above grade plane. It will also align Section 506.4.1 with the provisions of Section 508 for nonseparated and separated occupancies. Section 506.4.1 currently addresses cases where the building consists entirely of nonseparated occupancies and entirely of separated occupancies. It does not, however, address cases where there is a combination of nonseparated and separated occupancies. It also is not comprehensive in its approach by being silent on a requirement limiting the allowable area per story ( $A_a$ ) at each story where the building consists entirely of separated occupancies. This requirement is necessary for consistency with Item #3 of Section 506.4, which limits the allowable area per story ( $A_a$ ) at each story.

Because of the complexity involved in specifying the requirements for each case, they are proposed as separate items. The method of determining allowable building area when separated occupancies are present ("unity" equation) is specified for each applicable case rather than referencing a method of determination (Section 508.3.3) that is not necessarily applicable to the specific design conditions in Section 506.4.1. The method of determination in Section 508.3.3.2, however, is directly applicable to consideration of individual stories and is referenced in Item #2. It is not directly applicable to consideration of multiple stories, which is the case in Items #4 and #5.

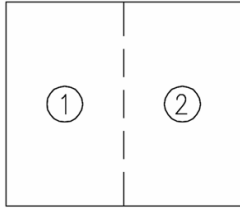
"Floors" is changed to "stories" because Section 506.4.1 is a continuation of Section 506.4, which limits the maximum area of buildings with more than one story above grade plane by applying multiples of the allowable area per story ( $A_a$ ). Refer to code change proposal G86-04/05 (AM) for further information. References to two-story buildings and buildings three stories or greater are changed to buildings with two stories above grade plane and buildings with three or more stories above grade plane, respectively, for consistency with the provisions in Section 506.4. Refer to code change proposal G103-04/05 (AMPC1) for further information.

A summary of the items and their provisions is as follows:

1. All nonseparated occupancies, each story individually considered and multistory condition: most restrictive provisions for each occupancy by referencing Section 508.3.2.2.
2. All separated occupancies, each story individually considered: apply unity equation at each story by referencing Section 508.3.3.2, maximum 1.0.
3. Combination of nonseparated and separated occupancies, each story individually considered: apply unity equation to each story, maximum 1.0.
4. All separated occupancies, multistory condition: apply unity equation to all stories included in total allowable building area, maximum 2.0 (2 stories above grade plane), maximum 3.0 (3 or more stories above grade plane).
5. Combination of nonseparated and separated occupancies, multistory condition: apply unity equation to all stories included in total allowable building area, maximum 2.0 (2 stories above grade plane), maximum 3.0 (3 or more stories above grade plane).

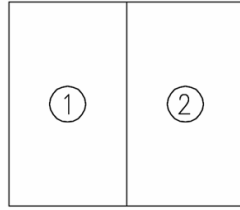
Two diagrams accompany this proposal. The first diagram illustrates the basic conditions for a building consisting of all nonseparated occupancies (condition #1), all separated occupancies (condition #2), and a combination of nonseparated and separated occupancies (condition #3). The second diagram illustrates additional combinations of nonseparated and separated occupancies.

NONSEPARATED:  
(Condition #1)



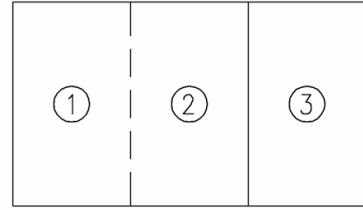
PLAN

SEPARATED:  
(Condition #2)

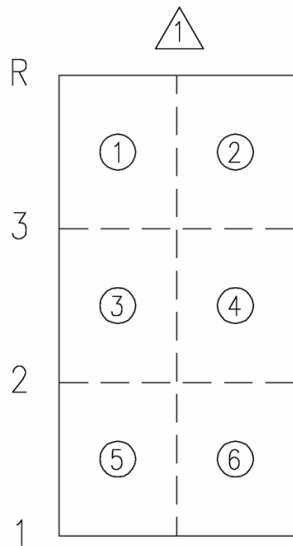


PLAN

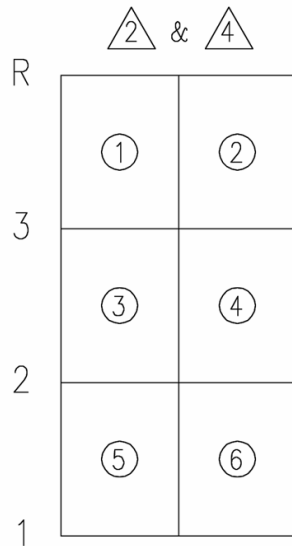
COMBINATION:  
(Condition #3)



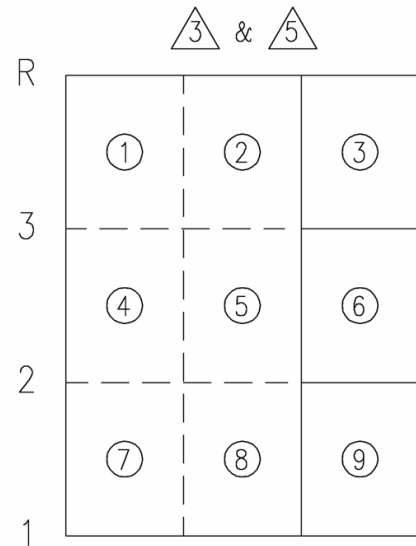
PLAN



SECTION  
(One fire area)



SECTION  
(Six fire areas)



SECTION  
(Four fire areas)

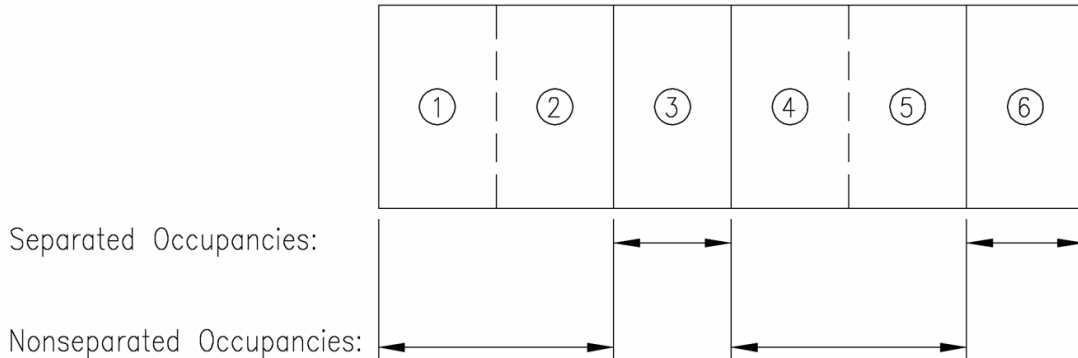
LEGEND:

- ① Occupancy
- Separation between occupancies
- - - Nonseparation between occupancies
- △ Refers to proposed item in Section 506.4.1

MIXED OCCUPANCIES

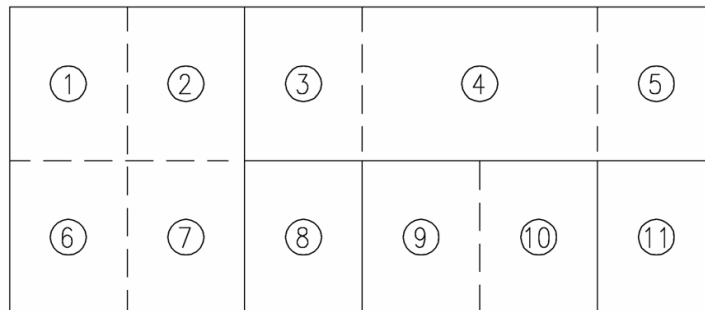
COMBINATION, CONTINUED:

(Condition #3)



SINGLE-STORY  
PLAN AND SECTION

(Four fire areas)



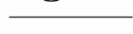
MULTISTORY SECTION

(Five fire areas)

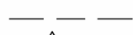
LEGEND:



Occupancy



Separation between occupancies



Nonseparation between occupancies



Refers to proposed item in Section 506.4.1

MIXED OCCUPANCIES

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

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