G93–07/08
412.2.4

Proponent: Randall R. Dahmen, WI Registered PE, representing the WI Licensed Commercial Building Inspector

Revise as follows:

412.2.4 Heating equipment. Heating equipment shall be placed in another room separated by 2-hour fire-resistance-rated fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both ~~construction~~. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended at least 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar and at least 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. A single interior door shall be allowed, provided the sources of ignition in the appliances are at least 18 inches (457 mm) above the floor.

Reason: As stated in the 2006 commentary "As part of the special use and occupancy requirements for commercial aircraft hangars, all possible ignition sources must be controlled and isolated. Specifically, all heating equipment must be located in rooms that are separated from the main areas where the aircraft are parked. This separation must be a 2-hour fire-resistance-rated construction. Although not explicitly stated in the current wording, all openings through the fire rated walls must be protected…"

Because the type of fire rated assembly is not currently defined, the means by which to protect a penetration to the assembly is in question. By defining the fire rated assemblies as either a fire barrier or a horizontal fire assembly, this directs the code user to IBC sections 711, 712, 716.5.2 & 715.6 for the proper means on how to address penetrations.

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

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

G94–07/08
412.5.4

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

412.5.4 Means of egress. The means of egress from heliports and helistops shall comply with the provisions of Chapter 10. Landing areas located on buildings or structures shall have two or more means of egress. For landing areas less than 60 ft (18,288mm) in length or less than 2,000 square feet (186 m^2) in area, the second means of egress may be a fire escape, alternating tread device or ladder leading to the floor below.

Reason: The purpose of this proposed change is to allow the use of alternating tread devices as a second means of egress from Heliports and Helistops with landing areas less than 60 ft in length or less than 2,000 square feet in area.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to heliports and helistops that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 412.5.4 is overly restrictive in that it does not allow the use of alternating tread devices as a second means of egress from heliports or helistops, but does allow ladders for such use. Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and side rails), are typically safer to use than vertical ladders and would be suitable for the application specified in section 412.5.4. IBC-2006 allows the use of alternating tread devices in sections, including but not limited to, 1009.11, 1015.3, 1015.4, 1015.6.1. Additionally, proposal E134-06/07, which was approved at the Code Development Hearings in September 2006, added the use of alternating tread devices to Helistops to section 1019.1.2.

Bibliography

IBC code change proposal E134-06/07
Performance, perceived safety and comfort of the alternating tread stair, Virginia Polytechnic and State University, Jorna, Mohageg and Snyder, March 1989

Cost Impact: The code change proposal could result in a minor increase in construction costs if alternating tread devices are used in lieu of ladders as the second means of egress to Heliports or Helistops.

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

G95–07/08
412.5.4

Proponent: Ken Kraus, Los Angeles Fire Department, CA

Revise as follows:

412.5.4 Means of egress. The means of egress from heliports and helistops shall comply with the provisions of Chapter 10. Landing areas located on buildings or structures shall have two or more means of egress. ~~For landing areas less than 60 feet (18 288 mm) in length, or less than 2,000 square feet (186m$_2$) in area, the second means of egress may be a fire escape or ladder leading to the floor below.~~

Reason: The intent of this code change proposal is to not allow ladders or fire escapes to serve as one of the means of egress from a heliport or helistop.

Heliports and helipads require maximum flexibility to be useful in all conditions. A change in wind direction of 180 degrees can render a means of egress that was previously ideal, totally useless. This is due to the fact that all communications and approaching the aircraft should be accomplished from the front with direct eye contact with the pilot and since helicopters normally land and take-off into the wind. The tail rotor end of the aircraft is considered too dangerous to consider as a portion of exit access. Exits complying with Chapter 10, including separation distances

Emergencies on heliports and helistops can leave one means of egress unusable and may necessitate the need for transferring injured via stairs to elevators. The remaining egress option should lead to a stair.

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

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

G96–07/08
[F] 414.1.3

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the American Pyrotechnics Association (APA)

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 414.1.3 (Supp) Information required. ~~A report shall be submitted to the building official identifying the~~ Where the quantities of hazardous materials are expected to exceed the maximum ~~expected~~ allowable quantities of hazardous materials per control area to be stored, used in a closed system and used in an open system, and subdivided, a report shall be submitted to the building official identifying those hazardous materials to separately address hazardous materials classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.

For buildings and structures with an occupancy in Group H, separate floor plans shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure.

Reason: This is an editorial clarification to indicate that the required report is only triggered if it is expected that the MAQ's per control area will be exceeded.

Cost Impact: This code change will not increase the cost of construction.

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

G97–07/08
Table [F] 415.3.1

Proponent: Lon Santis, Institute of Makers of Explosives

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Delete table and substitute as follows:

~~[F] TABLE 415.3.1~~
~~MINIMUM SEPARATION DISTANCES FOR BUILDINGS CONTAINING EXPLOSIVE MATERIALS~~

~~QUANTITY OF EXPLOSIVE MATERIAL[a]~~		~~MINIMUM DISTANCE (feet)~~		
		~~Lot lines[b] and inhabited buildings[c]~~		~~Separation of magazines[d, e, f]~~
~~Pounds over~~	~~Pounds not over~~	~~Barricaded[d]~~	~~Unbarricaded~~	
~~2~~	~~5~~	~~70~~	~~140~~	~~12~~
~~5~~	~~10~~	~~90~~	~~180~~	~~16~~
~~10~~	~~20~~	~~110~~	~~220~~	~~20~~
~~20~~	~~30~~	~~125~~	~~250~~	~~22~~
~~30~~	~~40~~	~~140~~	~~280~~	~~24~~
~~40~~	~~50~~	~~150~~	~~300~~	~~28~~
~~50~~	~~75~~	~~170~~	~~340~~	~~30~~
~~75~~	~~100~~	~~190~~	~~380~~	~~32~~
~~100~~	~~125~~	~~200~~	~~400~~	~~36~~
~~125~~	~~150~~	~~215~~	~~430~~	~~38~~
~~150~~	~~200~~	~~235~~	~~470~~	~~42~~
~~200~~	~~250~~	~~255~~	~~510~~	~~46~~
~~250~~	~~300~~	~~270~~	~~540~~	~~48~~
~~300~~	~~400~~	~~295~~	~~590~~	~~54~~
~~400~~	~~500~~	~~320~~	~~640~~	~~58~~
~~500~~	~~600~~	~~340~~	~~680~~	~~62~~
~~600~~	~~700~~	~~355~~	~~710~~	~~64~~
~~700~~	~~800~~	~~375~~	~~750~~	~~66~~
~~800~~	~~900~~	~~390~~	~~780~~	~~70~~
~~900~~	~~1,000~~	~~400~~	~~800~~	~~72~~
~~1,000~~	~~1,200~~	~~425~~	~~850~~	~~78~~
~~1,200~~	~~1,400~~	~~450~~	~~900~~	~~82~~
~~1,400~~	~~1,600~~	~~470~~	~~940~~	~~86~~
~~1,600~~	~~1,800~~	~~490~~	~~980~~	~~88~~
~~1,800~~	~~2,000~~	~~505~~	~~1,010~~	~~90~~
~~2,000~~	~~2,500~~	~~545~~	~~1,090~~	~~98~~

QUANTITY OF EXPLOSIVE MATERIAL[a]		MINIMUM DISTANCE (feet)		
		Lot lines[b] and inhabited buildings[c]		Separation of magazines[d, e, f]
Pounds over	Pounds not over	Barricaded[d]	Unbarricaded	
2,500	3,000	580	1,160	104
3,000	4,000	635	1,270	116
4,000	5,000	685	1,370	122
5,000	6,000	730	1,460	130
6,000	7,000	770	1,540	136
7,000	8,000	800	1,600	144
8,000	9,000	835	1,670	150
9,000	10,000	865	1,730	156
10,000	12,000	875	1,750	164
12,000	14,000	885	1,770	174
14,000	16,000	900	1,800	180
16,000	18,000	940	1,880	188
18,000	20,000	975	1,950	196
20,000	25,000	1,055	2,000	210
25,000	30,000	1,130	2,000	224
30,000	35,000	1,205	2,000	238
35,000	40,000	1,275	2,000	248
40,000	45,000	1,340	2,000	258
45,000	50,000	1,400	2,000	270
50,000	55,000	1,460	2,000	280
55,000	60,000	1,515	2,000	290
60,000	65,000	1,565	2,000	300
65,000	70,000	1,610	2,000	310
70,000	75,000	1,655	2,000	320
75,000	80,000	1,695	2,000	330
80,000	85,000	1,730	2,000	340
85,000	90,000	1,760	2,000	350
90,000	95,000	1,790	2,000	360
95,000	100,000	1,815	2,000	370
100,000	110,000	1,835	2,000	390
110,000	120,000	1,855	2,000	410
120,000	130,000	1,875	2,000	430
130,000	140,000	1,890	2,000	450
140,000	150,000	1,900	2,000	470

QUANTITY OF EXPLOSIVE MATERIAL[a]		MINIMUM DISTANCE (feet)		
		Lot lines[b] and inhabited buildings[c]		Separation of magazines[d, e, f]
Pounds over	Pounds not over	Barricaded[d]	Unbarricaded	
150,000	160,000	1,935	2,000	490
160,000	170,000	1,965	2,000	510
170,000	180,000	1,990	2,000	530
180,000	190,000	2,010	2,010	550
190,000	200,000	2,030	2,030	570
200,000	210,000	2,055	2,055	590
210,000	230,000	2,100	2,100	630
230,000	250,000	2,155	2,155	670
250,000	275,000	2,215	2,215	720
275,000	300,000	2,275	2,275	770

For SI: 1 pound = 0.454 kg, 1 foot = 304.8 mm.

a. The number of pounds of explosives listed is the number of pounds of trinitrotoluene (TNT) or the equivalent pounds of other explosive.

b. The distance listed is the distance to lot line, including lot lines at public ways.

c. For the purpose of this table, an inhabited building is any building on the same property that is regularly occupied by people. Where two or more buildings containing explosives or magazines are located on the same property, each building or magazine shall com ply with the minimum distances specified from inhabited buildings and, in addition, they shall be separated from each other by not less than the distance shown for "Separation of magazines," except that the quantity of explosive materials contained in detonator buildings or magazines shall govern in regard to the spacing of said buildings or magazines from buildings or magazines, as a group, shall be considered as one building or magazine, and the total quantity of explosive materials stored in such group shall be treated as if the explosive were in a single building or magazine located on the site of any building or magazine of the group, and shall comply with the minimum distance specified from other magazines or in habited buildings.

d. Barricades shall effectively screen the building containing explosives from other buildings, public ways or magazines. Where mounds or reverted walls of earth are used for barricades, they shall not be less than 3 feet in thickness. A straight line from the top of any side wall of the building containing explosive materials to the eave line of any other building, magazine or a point 12 feet above the centerline of a public way shall pass through the barricades.

e. Magazine is a building or structure, other than an operating building, approved for storage of explosive materials. Portable or mobile magazines not exceeding 120 square feet (11 m^2) in area need not comply with the requirements of this code, however, all magazines shall comply with the International Fire Code.

f. The distance listed is permitted be reduced by 50 percent where approved natural or artificial barriers are provided in accordance with the requirements in Note d.

[F]TABLE 415.3.1 (IFC [F] 3304.5.2(1))
AMERICAN TABLE OF DISTANCES FOR STORAGE OF EXPLOSIVES AS APPROVED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES AND REVISED JUNE 1991[a]

QUANTITY OF EXPLOSIVE MATERIALS[c]		DISTANCES IN FEET							
		Inhabited buildings		Public highways with traffic volume less than 3,000 vehicles per day		Public highways with traffic volume greater than 3,000 vehicles per day and passenger railways		Separation of magazinesd	
Pounds over	Pounds not over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
0	5	70	140	30	60	51	102	6	12
5	10	90	180	35	70	64	128	8	16
10	20	110	220	45	90	81	162	10	20
20	30	125	250	50	100	93	186	11	22
30	40	140	280	55	110	103	206	12	24
40	50	150	300	60	120	110	220	14	28
50	75	170	340	70	140	127	254	15	30
75	100	190	380	75	150	139	278	16	32
100	125	200	400	80	160	150	300	18	36
125	150	215	430	85	170	159	318	19	38
150	200	235	470	95	190	175	350	21	42
200	250	255	510	105	210	180	378	23	46
250	300	270	540	110	220	201	402	24	48
300	400	295	590	120	240	221	442	27	54
400	500	320	640	130	260	238	476	29	58
500	600	340	680	135	270	253	506	31	62
600	700	355	710	145	290	266	532	32	64
700	800	375	750	150	300	278	556	33	66
800	900	390	780	155	310	289	578	35	70
900	1,000	400	800	160	320	300	600	36	72
1,000	1,200	425	850	165	330	318	636	39	78
1,200	1,400	450	900	170	340	336	672	41	82
1,400	1,600	470	940	175	350	351	702	43	86
1,600	1,800	490	980	180	360	366	732	44	88
1,800	2,000	505	1,010	185	370	378	756	45	90
2,000	2,500	545	1,090	190	380	408	816	49	98
2,500	3,000	580	1,160	195	390	432	864	52	104
3,000	4,000	635	1,270	210	420	474	948	58	116
4,000	5,000	685	1,370	225	450	513	1,026	61	122
5,000	6,000	730	1,460	235	470	546	1,092	65	130
6,000	7,000	770	1,540	245	490	573	1,146	68	136
7,000	8,000	800	1,600	250	500	600	1,200	72	144
8,000	9,000	835	1,670	255	510	624	1,248	75	150
9,000	10,000	865	1,730	260	520	645	1,290	78	156
10,000	12,000	875	1,750	270	540	687	1,374	82	164
12,000	14,000	885	1,770	275	550	723	1,446	87	174
14,000	16,000	900	1,800	280	560	756	1,512	90	180
16,000	18,000	940	1,880	285	570	786	1,572	94	188
18,000	20,000	975	1,950	290	580	813	1,626	98	196
20,000	25,000	1,055	2,000	315	630	876	1,752	105	210
25,000	30,000	1,130	2,000	340	680	933	1,866	112	224
30,000	35,000	1,205	2,000	360	720	981	1,962	119	238
35,000	40,000	1,275	2,000	380	760	1,026	2,000	124	248
40,000	45,000	1,340	2,000	400	800	1,068	2,000	129	258
45,000	50,000	1,400	2,000	420	840	1,104	2,000	135	270
50,000	55,000	1,460	2,000	440	880	1,140	2,000	140	280
55,000	60,000	1,515	2,000	455	910	1,173	2,000	145	290
60,000	65,000	1,565	2,000	470	940	1,206	2,000	150	300
65,000	70,000	1,610	2,000	485	970	1,236	2,000	155	310
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000	160	320
75,000	80,000	1,695	2,000	510	1,020	1,293	2,000	165	330
80,000	85,000	1,730	2,000	520	1,040	1,317	2,000	170	340
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000	175	350
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000	180	360
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000	185	370
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000	195	390
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000	205	410
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000	215	430
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000	225	450
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000	235	470
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000	245	490
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000	255	510
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000	265	530
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000	275	550

QUANTITY OF EXPLOSIVE MATERIALS[c]		DISTANCES IN FEET							
		Inhabited buildings		Public highways with traffic volume less than 3,000 vehicles per day		Public highways with traffic volume greater than 3,000 vehicles per day and passenger railways		Separation of magazinesd	
Pounds over	Pounds not over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
190,000	200,000	2,030	2,030	610	1,220	1,755	2,000	285	570
200,000	210,000	2,055	2,055	620	1,240	1,782	2,000	295	590
210,000	230,000	2,100	2,100	635	1,270	1,836	2,000	315	630
230,000	250,000	2,155	2,155	650	1,300	1,890	2,000	335	670
250,000	275,000	2,215	2,215	670	1,340	1,950	2,000	360	720
275,000	300,000[b]	2,275	2,275	690	1,380	2,000	2,000	385	770

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.

a. This table applies only to the manufacture and permanent storage of commercial explosive materials. It is not applicable to transportation of explosives or any handling or temporary storage necessary or incident thereto. It is not intended to apply to bombs, projectiles or other heavily encased explosives.
b. Storage in excess of 300,000 pounds of explosive materials in one magazine is not allowed.
c. Where a manufacturing building on an explosive materials plant site is designed to contain explosive materials, such building shall be located with respect to its proximity to inhabited buildings, public highways and passenger railways based on the maximum quantity of explosive materials permitted to be in the building at one time.
d. Where two or more storage magazines are located on the same property, each magazine shall comply with the minimum distances specified from inhabited buildings, railways and highways, and, in addition, they should be separated from each other by not less than the distances shown for separation of magazines, except that the quantity of explosives in detonator magazines shall govern in regard to the spacing of said detonator magazines from magazines containing other explosive materials. Where any two or more magazines are separated from each other by less than the specified separation of magazines distances, then two or more such magazines, as a group, shall be considered as one magazine, and the total quantity of explosive materials stored in such group shall be treated as if stored in a single magazine located on the site of any magazine in the group and shall comply with the minimum distances specified from other magazines, inhabited buildings, railways and highways.

Reason: This revision to replace current Table 415.3.1 with IFC Table 3304.5.2(1) would make the IBC and IFC consistent with each other. Currently, code officials are confused by the inconsistency. The change would also make the IBC consistent with Federal regulations of ATF, OSHA, and MSHA; state regulations; and industry standards.

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

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

G98–07/08
[F] 415.6, [F] 415.7.1 (New)

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

[F] 415.6.2 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids in Group H-2 and H-3 occupancies shall be in accordance with 415.6.2.1 through 415.6.2.10, the *International Mechanical Code* and the *International Fire Code*.

2. Add new text as follows:

[F] 415.7.1 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids in Group H-3 occupancies shall be in accordance with 415.6.2.

(Renumber subsequent sections)

Reason: Flammable and combustible liquids can cause an occupancy to be classified as H-2 or H-3, and the fact that these materials are currently addressed under 415.6.2 for H-2 is confusing. The proposed revisions fix this by adding appropriate references for H-3.

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

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

G99–07/08
[F] 415.6.2.4

Proponent: Daniel E. Nichols, PE, New York State Division of Code Enforcement and Administration, Albany, NY

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**[F] 415.6.2.4 Suppression.** Group H shall be equipped throughout with an approved automatic sprinkler system, installed in accordance with Section 903.~~

Reason: Section 415.6.2.4 is redundant and can be deleted. Sections 903.2.4.1 of both the IFC and IBC require all H occupancies to be protected with an automatic sprinkler system. Section 415.6 does not need to repeat the requirement. Further Section 415.6 addresses special provisions for H-2 occupancies – not all H occupancies. Even if the section were to remain, it is too comprehensive.

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

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

G100–07/08
[F] 415.6.3, Chapter 35 (New)

Proponent: Larry Fluer, Larry Fluer, Inc., representing the Compressed Gas Association

THIS PROPOSAL IS ON THE AGENDA OF THE IFC DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 415.6.3 Liquefied petroleum gas ~~distribution~~ facilities. The construction and installation of liquefied petroleum gas facilities shall be in accordance with the requirements of this code, the *International Fire Code,* the *International Mechanical Code*, the *International Fuel Gas Code* and NFPA 58.

~~The design and construction of propane, butane, propylene, butylene and other liquefied petroleum gas distribution facilities shall conform to the applicable provisions of Sections 415.6.3.1 through 415.6.3.5.2. The storage and handling of liquefied petroleum gas systems shall conform to the *International Fire Code*. The design and installation of piping, equipment and systems that utilize liquefied petroleum gas shall be in accordance with the *International Fuel Gas Code*. Liquefied petroleum gas distribution facilities shall be ventilated in accordance with the *International Mechanical Code* and Section 415.6.3.1.~~

~~**[F] 415.6.3.1 Air movement.** Liquefied petroleum gas distribution facilities shall be provided with air inlets and outlets arranged so that air movement across the floor of the facility will be uniform. The total area of both inlet and outlet openings shall be at least 1 square inch (645 mm2) for each 1 square foot (0.093 m2) of floor area. The bottom of such openings shall not be more than 6 inches (152 mm) above the floor.~~

~~**[F] 415.6.3.2 (Supp) Construction.** Liquefied petroleum gas distribution facilities shall be constructed in accordance with Section 415.6.3.3 for separate buildings, Section 415.6.3.4 for attached structures or Section 415.6.3.5 for rooms within buildings.~~

~~**[F] 415.6.3.3 Separate buildings.** Where located in separate buildings, liquefied petroleum gas-distribution facilities shall be occupied exclusively for that purpose or for other purposes having similar hazards. Such buildings shall be limited to one story in height and shall conform to Sections 415.6.3.3.1 through 415.6.3.3.3.~~

~~**[F] 415.6.3.3.1 Floors.** The floor shall not be located below ground level and any spaces beneath the floor shall be solidly filled or shall be unenclosed.~~

~~**[F] 415.6.3.3.2 Materials.** Walls, floors, ceilings, columns and roofs shall be constructed of noncombustible materials.~~

~~**[F] 415.6.3.3.3 Explosion venting.** Explosion venting shall be provided in accordance with the *International Fire Code*.~~

~~**[F] 415.6.3.4 (Supp) Attached structures.** Where liquefied petroleum gas-distribution facilities are located in an attached structure, the attached perimeter shall not exceed 50 percent of the perimeter of the space enclosed and the facility shall comply with Sections 415.6.3.3 and 415.6.3.4.1. Where the attached perimeter exceeds 50 percent, such facilities shall comply with Section 415.6.3.5.~~

~~**[F] 415.6.3.4.1 (Supp) Fire separation**. Attached structures shall be separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 1 hour and the fire barriers shall not have openings. Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.~~

> ~~**Exception:** Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section 706.7.~~

~~**[F] 415.6.3.5 Rooms within buildings.** Where liquefied petroleum gas-distribution facilities are located in rooms within buildings, such rooms shall be located in the first story above grade plane and shall have at least one exterior wall with sufficient exposed area to provide explosion venting as required in the *International Fire Code*. The building in which the room is located shall not have a basement or unventilated crawl space and the room shall comply with Sections 415.6.3.5.1 and 415.6.3.5.2.~~

~~**[F] 415.6.3.5.1 Materials.** Walls, floors, ceilings and roofs of such rooms shall be constructed of approved noncombustible materials.~~

~~**[F] 415.6.3.5.2 (Supp) Fire separation**. The rooms shall be separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 1 hour and the fire barriers shall not have openings. Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (4788 Pa), except where the building, within which the room is located, is occupied by operations or processes having a similar hazard.~~

> ~~**Exception:** Fire barriers between common walls occupied only for the storage of LP-gas are permitted to have opening protectives complying with Section 715.~~

2. Add standard to Chapter 35 as follows:

NFPA

58-04 Liquefied Petroleum Gas Code

Reason: The provisions of 415.6.3 are a carry over from one of the Legacy codes. The requirements are applicable to "Liquefied petroleum gas (LP-Gas)-distribution facilities" which as a term is undefined in the IBC and not used in the IFC. NFPA 58 provides a comprehensive set of construction requirements for LP Gas-distribution facilities as well as bulk plants, and industrial plant in which LP gas systems, storage systems, vaporizers, mixing systems and similar activities are involved. The terminology used in the existing IBC provisions include terms that are undefined within the ICC system including "separate building and attached building." The ICC approach uses "detached buildings" and buildings of mixed use or occupancy.

IFGC Section 406.2.1 refers the user to Chapter 10 of NFPA 58 (Buildings or Structures Housing LP Gas-Distribution Facilities) for construction requirements in areas used exclusively to house industrial processes, research and experimental laboratories, or equipment or processing having similar hazards under certain use specific conditions. The reference in the IFGC is intended to get the user to a set of comprehensive provisions which are only found in NFPA 58. IMC Section 502.9.10 requires LP Gas-distribution facilities to be ventilated in accordance with NFPA 58, and no reference is made to IBC Section 415.6.3.

There are no requirements in the IBC that address the construction of *bulk plants* or *industrial plants* and those provisions are only found in NFPA 58. The term *industrial plant* is unique to the NFPA regulatory approach, and it does not correlate with the terminology used within the ICC system. Requirements for cylinder storage areas are not found within the context of "gas-distribution facilities" as they are regulated by other aspects of the LP-Gas Code. The lack of definition has proven to be problematical for some users that handle small quantities of LP-Gas where the primary business is related to the storage and filling of other industrial gases that are located in an IBC compliant H-2 facility, and applicability and adequacy of Section 415.6.3 is called into question.

Chapter 38 of the IFC in Section 3801.1 requires compliance with NFPA 58. Chapter 27 of the IFC in Section requires that building construction comply with the IBC. Deferring construction elements to NFPA 58 will allow the user to determine the requirements for all facilities where LP Gas is stored or used, not just LP Gas-distribution facilities. The application of NFPA 58 is complex, and having an extract of a limited portion of this comprehensive standard (LP Gas Code) in the IBC does not serve to solve problems in application. Should potential conflict arise between application of NFPA 58 and the IBC provisions of the IBC will govern as stated in Section 102.4. This same approach has been used in Section 415.6.4 relative to the construction of dry cleaning plants which must meet the requirements of the IBC as well as those of NFPA 32.

When used in conjunction with the existing requirements of the IFC, IFGC and IMC referring the user to NFPA 58 for construction will improve the overall regulatory approach to control while coordinating with a recognized national standard which is currently referenced by the IFC, IFGC and IMC.

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

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

G101–07/08
[F] 415.8.5.2.2

Proponent: Joseph T. Holland, III, Hoover Treated Wood Products

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 415.8.5.2.2 Liquid storage rooms. Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms in excess of 500 square feet (46.5 m^2) shall have at least one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by fire barriers having a fire-resistance rating of not less than 1-hour for rooms up to 150 square feet (13.9 m^2) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m^2) in area.
3. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood of not less than 1inch (25 mm) nominal thickness <u>or fire-retardant-treated wood in accordance with Section 2303.2</u>.
4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

Reason: Permit FRTW to be used for shelving, racks, and wainscoting in HPM facility.

Fire-retardant-treated wood has a Class A flame spread. It is recognized for application where noncombustible materials are required. The use of FRTW can result in the reduced possibility that the wood will become involved in a fire or spread the fire.

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

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

G102–07/08
419.1

Proponent: Tim Pate, City & County of Broomfield Building Department, CO, representing the Colorado Chapter of ICC

Revise as follows:

419.1 (Supp) General. A live/work unit is a dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant and shall comply with Section 419.

Exception: Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit and is not available to the public to transact business shall not be classified as a live/work unit.

Reason: The wording in this exception would essentially allow someone to have a 3,000 square foot dwelling unit and have a 299 square foot public business on the main floor with storefront entry and not be required to follow any handicap accessibility requirements into or through this business area since it would not be classified a Live/Work Unit and section 419.7 would not apply. This issue was brought up when this original code change was brought forward in Orlando. The proponent Dave Collins admitted that this is a problem but he failed to fix it for the Final Action Hearings in Rochester. This new wording will fix this problem.

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

Analysis: The 2007 Supplement includes a new section 419, *Live/Work Units*.

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

G103–07/08
419.2

Proponent: Tim Pate, City & County of Broomfield Building Department, CO, representing the Colorado Chapter of ICC

Revise as follows:

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the non-residential portion of ~~in~~ the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

Reason: This new wording is required to clarify that the 10% limit of storage square footage should only be based on the square footage of the non-residential area and not the entire area of the live/work area. The present wording would mean you would have to include all of the closet areas in the residential portion. This would include kitchen pantry and all closets in halls and bedrooms. This was brought up as a problem when this code change was brought through in Orlando. The proponent Dave Collins admitted that it was a problem and not his intent but he failed to fix it when it went through the Final Action Hearings in Rochester. This new wording will fix this problem.

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

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

G104–07/08
419.2, 419.3, 508.2.4, 508.3.3

Proponent: Steven R. Winkel, FAIA, PE, The Preview Group, Inc., representing the American Institute of Architects; Stephan Kiefer, CBO, City of Livermore Building Division, CA

1. Revise as follows (2007 Supplement Live work units):

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 ~~508.3~~ shall not apply within the live/work unit when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

2. Revise as follows (2006 Code Section 419, Group I-1, R-1, R-2 and R-3):

419.2 (Supp) Separation walls. Walls separating dwelling units in the same building ~~and~~ walls separating sleeping units in the same building and walls separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as fire partitions in accordance with Section 708.

419.3 (Supp) Horizontal separation. Floor assemblies separating dwelling units in the same buildings and floor assemblies separating sleeping units in the same building and floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as horizontal assemblies in accordance with Section 711.

3. Revise as follows:

508.2.4 (Supp) Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section 508.2.5.
3. ~~Group R occupancies shall be separated from other accessory occupancies in accordance with Section 508.4.4.~~ Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them per the requirements of Section 419.

508.3.3 (Supp) Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.
2. ~~All Group R occupancies shall be separated from other occupancies in accordance with Section 508.4.4~~. Group I-1,. R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from other occupancies contiguous to them in accordance with the requirements of Section 419.

Reason: This proposal is an amendment to the changes made by G140-06/07 during the last code change cycle. The changes made by G140-06/07 had an overbroad scope that we believe went beyond the intent of what that code change proposal was attempting to accomplish. This amendment adjusts the scope of that prior code change to clarify the application of separation requirements while retaining what we believe was its intended scope of application. G140-06/07 as adopted requires broad application of separated occupancy provisions for all R occupancies for what otherwise should be considered as accessory or nonseparated occupancies. It is our belief that the problem G140-06/07 was attempting to address was to define where separations are required between dwelling units or sleeping units and the other portions of what are otherwise considered accessory or nonseparated occupancies. This condition occurs at the walls or floors where a group of dwelling or sleeping units ends in relationship to the rest of the mixed use building. The purpose of this proposal is the same as what we believe were the goals of G140-06/07, which is to clarify that separations between dwelling or sleeping units are still required, including at the perimeter wall or floor of a group of dwelling units or sleeping units. The original proposal was meant to apply for accessory or nonseparated uses as does the new proposal. The proposal defines when the accessory or nonseparated parts of a mixed use facility are to provide separations for dwelling units or sleeping units. The previous change applies broadly throughout R occupancies and effectively negates the use of accessory and nonseparated code provisions in those occupancies. We believe this proposal more accurately defines where the rated partitions and horizontal assemblies that are to separate portions of a building from each other begin and end. We consider that this proposal defines what is required at the wall or floor that surrounds a group of dwelling units or sleeping units where the surrounding wall or floor abuts another occupancy in a mixed use building. For example the wall at a sleeping unit in an R-1 occupancy (dwelling unit at an R-2 occupancy) which is contiguous to an adjacent retail space or restaurant would need to be rated based on the presence of sleeping or dwelling units, and the fact that the walls between the units and the other occupancy are contiguous. However, under the new proposal other parts of what otherwise could be considered as non-sleeping spaces in the R occupancy, such as the lobby, a restaurant or a gift shop could be treated as accessory or nonseparated uses in the way they relate to each other in the public parts of the facility. That would not be the case if the language from G140-6/07 remains in the code. The currently adopted language applies throughout the R occupancy, not just at the dwelling units or sleeping units. While the impact of the original proposal would be the greatest in R-1 occupancies where such mixed uses occur most often, we believe the requirements for separations between dwelling units or sleeping units should apply in all occupancies covered by Section 420 and the scope of application should be clarified for all of the occupancies covered by Section 420.

We have also included clarifications related to the new provisions for live/work units contained in Section 419 to make it clear that the supplementary separation requirements contained in Sections 420 and 508 are to be applied between separate live work units, not within the live/work unit. This clarifies that if the live/work units meets the criteria of Section 419 then the dwelling and livelihood related uses inside the unit are allowed to be nonseparated.

The modifications to Section 420 are to clarify the requirements for fire barriers and horizontal assemblies by adding the requirement for separation from contiguous occupancies in addition to the separations between dwelling units or sleeping units already contained in this code section.

Cost Impact: The code change proposal will not increase the cost of construction from the provisions contained in the 2007 Accumulative Supplement.

Analysis: Section 419 as referenced in items 2,3 and 4 of this proposal refers to the 2006 section titled Group I-1, R-1, R-2 and R-3. Section 420 as referenced in Item 1 of this proposal is intended to reference the same section but has been renumbered to work with the introduction of the new Section 419 (Supp) dealing with Live/Work units.

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

G105–07/08
419, 310.1 (IFC [B] 202), 508.1; IRC R101.2

Proponent: Tom Rubottom, City of Lakewood, CO, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING-ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Delete without substitution:

~~**SECTION 419 (Supp)**~~
~~**LIVE/WORK UNITS**~~

~~**419.1 (Supp) General.** A live/work unit is a dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant and shall comply with Section 419.~~

~~**Exception:** Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit shall not be classified as a live/work unit.~~

~~**419.1.1 (Supp) Limitations.** The following shall apply to all live/work areas:~~

1. ~~The live/work unit is permitted to be a maximum of 3,000 square feet (279 m_2);~~
2. ~~The nonresidential area is permitted to be a maximum 50 percent of the area of each live/work unit;~~
3. ~~The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and~~
4. ~~A maximum of five nonresidential workers or employees are allowed to occupy the non-residential area at any one time.~~

~~**419.2 (Supp) Occupancies.** Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.~~

~~**419.3 (Supp) Means of egress.** Except as modified by this section, the provisions for Group R-2 occupancies in Chapter 10 shall apply to the entire live/work unit.~~

~~**419.3.1 (Supp) Egress capacity**. The egress capacity for each element of the live/work unit shall be based on the occupancy load for the occupancy served in accordance with Table 1004.1.1.~~

~~**419.3.2 (Supp) Sliding doors.** Where doors in a means of egress are of the horizontal-sliding type, the force to slide the door to its fully open position shall not exceed 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).~~

~~**419.3.3 (Supp) Spiral stairs.** Spiral stairs that conform to the requirements of Section 1009.8 shall be permitted.~~

~~**419.3.4 (Supp) Locks.** Egress doors shall be permitted to be locked in accordance with Exception 4 of Section 1008.1.8.3.~~

~~**419.4 (Supp) Vertical openings.** Floor openings between floor levels of a live/work unit are permitted without enclosure.~~

~~**419.5 (Supp) Fire protection.** The live/work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9 and a fire sprinkler system in accordance with Section 903.2.7.~~

~~**419.6 (Supp) Structural.** Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.~~

~~**419.7 (Supp) Accessibility.** Accessibility shall be designed in accordance with Chapter 11.~~

~~**419.8 (Supp) Ventilation.** The applicable requirements of the *International Mechanical Code* shall apply to each area within the live/work unit for the function within that space.~~

310.1 (IFC [B] 202) (Supp) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (not transient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
~~Live/work units~~
Monasteries
Motels (nontransient)
Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units.
Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.

Congregate living facilities with 16 or fewer persons.
Adult care and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*

.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, or shall comply with the *International Residential Code.*

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a separate and detached building or structure.
3. ~~Live/Work Units in accordance with Section 419 are not considered separate occupancies.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

R101.2 (Supp) Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress and their accessory structures.

~~**Exception:** Live/work units complying with the requirements of Section 419 of the *International Building Code* shall be permitted to be built as one- and two-family dwellings or townhouses. Fire suppression required by Section 419.5 of the *International Building Code* when constructed under the *International Residential Code for One- and Two-family Dwellings* shall conform to Section 903.3.1.3 of the *International Building Code*.~~

Reason: Section 419 as written has major flaws and creates more problems than it solves. Example: A 3,000 square foot live/work unit could contain a 1,500 square foot restaurant containing a 500 square foot kitchen and a 1,000 square foot dining area. Restaurants of this size would probably not require more than 5 employees.

The occupant load of the space would be Kitchen 500/200 = 3; Dining 1,000/15 = 67.

Section 419.2 would classify this area as Group R-2, rather than Group A-2.

Section 419.3 would require the means of egress to comply as a Group R-2 except for specific modifications made by Section 419.

Section 419 would not require panic hardware, egress illumination provided with emergency power, posting of occupant load, exits signs and enclosed stairways.

Section 419 would not require toilet room in the restaurant or a service sink.

This same restaurant across the street or next door that did not have a dwelling unit connected would be required to comply.

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

PART I – IBC GENERAL

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

PART II – IRC BUILDING/ENERGY

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

G106–07/08

419.4 (New); IRC R304.5 (New); IPC Table 403.1 (IBC [P] Table 2902.1)

Proponent: Dave Collins, AIA, The Preview Group, Inc., representing the AIA Codes Committee

THESE PROPOSALS ARE ON THE AGENDA FOR THE IBC GENERAL, IRC BUILDING ENERGY CODE, AND IPC DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Add new text as follows:

419.4 Arrangement of dwelling units and sleeping units. Dwelling units and sleeping units shall comply with the Sections 419.4.1 through 419.4.8

419.4.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

419.4.2 Access from sleeping areas. Sleeping areas within a dwelling unit or sleeping unit shall not constitute the only means of access to other sleeping areas or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

Exception: Dwelling units and sleeping units that contain fewer than two bedrooms.

419.4.3 Water closet access. Every sleeping area of a dwelling unit or sleeping unit shall have access to at least one water closet and one lavatory without passing through another sleeping area. Every sleeping area in a dwelling unit or sleeping unit shall have access to at least one water closet and lavatory located on the same story as the sleeping area or on an adjacent story.

419.4.4 Congregate living facilities. In congregate living facilities, provide fixtures in accordance with Table 2902.1.

419.4.5 Group R-1 occupancies. In Group R-1 occupancies, where private water closets, lavatories and baths are not provided within a sleeping unit, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each ten occupants.

419.4.6 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall, a habitable space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a congregate living facility or a Group R-1 occupancy.

419.4.7 Bathroom access. Common use bathrooms serving sleeping units shall have access without passing through another sleeping area. Common use bathrooms shall be located on the same story as the sleeping unit or on an adjacent story.

419.4.8 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R304.5 Arrangement of dwelling units and sleeping units. Dwelling units and sleeping units shall comply with the Sections R304.5.1 through R304.5.5

R304.5.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

R304.5.2 Access from sleeping areas. Sleeping areas within a dwelling unit or sleeping unit shall not constitute the only means of access to other sleeping areas or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

Exception: Dwelling units and sleeping units that contain fewer than two bedrooms.

R304.5.3 Water closet access. Every sleeping area of a dwelling unit or sleeping unit shall have access to at least one water closet and one lavatory without passing through another sleeping area. Every sleeping area in a dwelling unit or sleeping unit shall have access to at least one water closet and lavatory located on the same story as the sleeping area or on an adjacent story.

R304.5.4 Congregate living facilities. In congregate living facilities, at least one water closet and lavatory shall be provided for each 10 occupants. In addition, at least one bathtub or shower shall be provided for each 8 occupants.

R304.5.4 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall , a habitable space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a congregate residence.

R304.5.5 Bathroom access. Common use bathrooms serving sleeping units shall have access without passing through another sleeping area. Common use bathrooms shall be located on the same story as the sleeping unit or on an adjacent story.

R304.5.6 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

PART III – IPC

Revise table as follows:

TABLE 403.1 (IBC [P] Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 (IBC [P] 2902.2) and 403.3 (IBC [P] 2902.3))

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (Urinals see Section 419.2)	LAVATORIES	BATHTUBS/ SHOWERS	DRINKING FOUNTAINS (See Section 410.1)	OTHER
7	Residential	R-3	Congregate living facilities with 16 or fewer person	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink

(Portions of table and footnotes not shown do not change)

Reason: The *International Property Maintenance Code* contains provisions which address the design of dwelling units, congregate residences, hotels, motels and boarding houses. Except for a portion of IPMC Sec. 404.4.2, none of these provisions are contained in either the IBC or IRC. It is therefore possible for a building to be designed and approved under the IBC and receive a certificate of occupancy that would then be immediately out of compliance with the IPMC. The IPMC should not have requirements that have to be maintained that are not required when a building is constructed. The solution is to either put them into the IBC and IRC or to delete them from the IPMC. This is one of two proposals to add these requirements into the construction codes. The proponent has also submitted an alternative proposal to delete the requirements from the IPMC. For the codes to be coordinated, either amendment of IBC and IRC or IPMC must be accomplished.

The concept behind the proposal was to concentrate the requirements in Section 419. Other locations were considered including Chapter 12, 10 and 29, however the proposal concentrates the items in 419 for the convenience of the code users. The provisions of the IPMC provisions which are the basis of this proposal are below. The intent of the proposal was to replicate these provisions into the IBC with identical language where appropriate. However, the IPMC uses terms which are not used in the IBC. Therefore certain changes were made. For example, "bedroom" was changed to "sleeping area"; "rooming unit" , "dormitory unit", and "housekeeping unit" were replaced with sleeping unit, congregate living facility or Group R1 occupancy as appropriate.

The current requirements in the IPMC is in conflict with what is required in Group R-4 homes in the IPC (i.e. one water closet and lavatory for each 10 occupants and one bath/shower for each 8 occupants.

The current IPMC does not allow for shared bathrooms in hotels or group home by requiring hall access in IPMC Section 503.2. This revised text here is worded to require access without going through another sleeping area, but will allow private baths or baths shared between two sleeping units.

2006 IBC, Section 310.1 allows congregate living facilities with 16 or fewer persons to be considered Group R-3. The current IPC does specify requirements for bathroom in congregate living facilities for Group R-3. The proposed addition to IPC Table 403.1 (IBC Table 2902.1) will mirror what is required for larger congregate living facilities under Group R-2 and assisted living facilities under Group R-4.

Provisions of the 2006 IPMC
404.4.2 Access from bedrooms. Bedrooms shall not constitute the only means of access to other bedrooms or habitable spaces and shall not serve as the only means of egress from other habitable spaces.
Exception: Units that contain fewer than two bedrooms.
404.4.3 Water closet accessibility. Every bedroom shall have access to at least one water closet and one lavatory without passing through another bedroom. Every bedroom in a dwelling unit shall have access to at least one water closet and lavatory located in the same story as the bedroom or an adjacent story.
404.7 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.
502.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink which shall be maintained in a sanitary, safe working condition. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.
502.2 Rooming houses. At least one water closet, lavatory and bathtub or shower shall be supplied for each four rooming units.
502.3 Hotels. Where private water closets, lavatories and baths are not provided, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each ten occupants.
503.1 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall or other space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a multiple dwelling.
503.2 Location. Toilet rooms and bathrooms serving hotel units, rooming units or dormitory units or housekeeping units, shall have access by traversing not more than one flight of stairs and shall have access from a common hall or passageway.

Cost Impact: This is simply a correlation among the codes and should have no cost impact.

PART I – IBC GENERAL

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

PART II – IRC BUILDING/ENERGY

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

PART III – IPC

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

G107–07/08
[F] 421 (New); IFC 3006.2.1, 3006.2.2, 3006.2.3

Proponent: Doug Hall, City of Westminster Fire Department, representing the Fire Marshal's Association of Colorado

THESE PROPOSALS ARE ON THE AGENDA FOR THE IBC GENERAL AND IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Add new text as follows:

[F] SECTION 421
MEDICAL GAS SYSTEMS

[F] 421.1. General. Where containers of medical gases in quantities greater than the permit amount specified in Section 105.6 of the *International Fire Code* are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 421.2, 421.3 or 421.4.

[F] 421.2 One-hour exterior rooms. A 1-hour exterior room shall be a room or enclosure separated from the remainder of the building by fire barriers, horizontal assemblies or both, with a fire-resistance rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. Rooms shall have at least one exterior wall that is provided with at least two vents. Each vent shall not be less than 36 square inches (0.023 m^2) in area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms shall be provided with at least one automatic sprinkler to provide container cooling in case of fire.

[F] 421.3 One-hour interior room. A 1-hour interior room shall be a room or enclosure separated from the remainder of the building by fire barriers, horizontal assemblies or both, with a fire-resistance rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. Where an exterior wall cannot be provided for the room, automatic sprinklers shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. Approved mechanical ventilation shall comply with the *International Mechanical Code* and be provided at a minimum rate of 1 cubic foot per minute per square foot [0.00508 $m^3/(s \times m^2)$] of the area of the room.

[F] 421.4 Gas cabinets. Gas cabinets shall be constructed in accordance with Section 2703.8.6 of the *International Fire Code* and the following:

1. The average velocity of ventilation at the face of access ports or windows shall not be less than 200 feet per minute (61 m/s) with a minimum of 150 feet per minute (46 m/s) at any point of the access port or window.
2. Gas cabinets shall be connected to an exhaust system.
3. Gas cabinets shall be internally sprinklered.

PART II – IFC

Revise text as follows:

3006.2 Interior supply location. Medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. Where containers of medical gases in quantities greater than the permit amount are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 3006.2.1, 3006.2.2 or 3006.2.3.

3006.2.1 One-hour exterior rooms. A 1-hour exterior room shall be a room or enclosure separated from the remainder of the building by fire barriers, horizontal assemblies or both, with a fire-resistance rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. Rooms shall have at least one exterior wall that is provided with at least two vents. Each vent shall not be less than 36 square inches (0.023 m^2) in area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms shall be provided with at least one automatic sprinkler to provide container cooling in case of fire.

3006.2.2 One-hour interior room. A 1-hour interior room shall be a room or enclosure separated from the remainder of the building by fire barriers, horizontal assemblies or both, with a fire-resistance rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. Where ~~When~~ an exterior wall cannot be provided for the room, automatic sprinklers shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. Approved mechanical ventilation shall comply with the *International Mechanical Code* and be provided at a minimum rate of 1 cubic foot per minute per square foot [0.00508 m3/(s × m2)] of the area of the room.

3006.2.3 Gas cabinets. Gas cabinets shall be constructed in accordance with Section 2703.8.6 and the following:

1. The average velocity of ventilation at the face of access ports or windows shall not be less than 200 feet per minute (61 m/s) with a minimum of 150 feet per minute (46 m/s) at any point of the access port or window.
2. Gas cabinets shall be connected to an exhaust system.
3. Gas cabinets shall be internally sprinklered.

Reason: Correlation is necessary between the *International Building* and Fire Codes in requiring the installation of properly constructed medical gas rooms. This revision will offer greater opportunity to ensure this specific requirement is addressed during the design and construction phase of a building.

The *International Fire Code* Section 3006 Medical Gas Systems requires construction and ventilation of medical gas storage rooms. There is no requirement in the *International Building Code* requiring compliance with this section. Several medical offices have been constructed and construction/design professionals were unaware of this service. Many fire service inspectors are not qualified to evaluate a 1-hour wall assembly for compliance and may require assistance from building inspectors in inspecting 1-hour wall assemblies. This code section will enhance the opportunity to provide more effective customer service. The addition of this section to the IBC will enhance the opportunity to provide a safe built environment as it relates to the hazards of medical gas storage.

The revisions to the IFC is for coordination with the current separation requirements in the IBC referring to fire barriers, horizontal assemblies or both for room separation that consist of walls, floors and ceiling. The current IFC title for Section 3006.2.1 and reference back to the exterior wall not being provided in the text implies a 1 hour rated interior room. The added language will clarify this requirement.

Cost Impact: No cost impact. The requirement for medical gas storage rooms presently exists and this proposal seeks to create correlation between the IBC and IFC.

Analysis: IFC Part II proposed revisions will be determined by the International Fire Code Development Committee. The placement of the revised text into the IBC will be determined by the IBC General Code Development Committee.

PART I – IBC GENERAL

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

PART I – IFC

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

G108–07/08
421 (New), Table 421.1 (New)

Proponent: Ronald O. Hamburger, SE, Simpson Gumpertz & Heger, Inc., representing the National Council of Structural Engineers Association Ad Hoc Joint Industry Committee on Structural Integrity

1. Add new text as follows:

SECTION 421
BUILDINGS REQUIRING A RISK ASSESSMENT

421.1 General. In addition to the other requirements of this code, buildings and other structures meeting the criteria indicated in Table 421.1 shall be in accordance with Sections 421.2 through 421.4.

TABLE 421.1
BUILDINGS AND OTHER STRUCTURES REQUIRING A RISK ASSESSMENT

1. Buildings more than 420 feet in height with an occupant load greater than 5,000.
2. Buildings and other structures with an occupant load greater than 10,000.
3. Buildings and other structures deemed by a jurisdiction to be at higher than normal risk of being subjected to acts characterized as terrorist threats.

421.2 Risk assessment. A risk assessment report performed by an approved agency with expertise in risk characterization for accidental and intentional hazards including terrorism threat and vulnerability assessment shall be provided to the building official. The assessment shall conform to generally accepted principles for risk analysis and follow industry guidelines for identifying and characterizing terrorism threats and evaluating vulnerability to extreme loads and events. Thorough documentation of the assessment, including assumptions, information sources, calculations and analyses, and referenced guidelines shall be submitted to the authority having jurisdiction for review and approval. Following acceptance of the risk assessment, the reports and other data submitted shall be returned to the building owner. Retention of these documents by the building official shall not be required.

421.3 Peer review. The building official is authorized to require an independent review of the risk assessment. The review shall be performed by one or more approved individuals with expertise in risk characterization for accidental and intentional hazards including terrorism threat and vulnerability assessment. The review shall include the assumptions used, the methods of analysis, and the findings. Upon completion of the review, the reviewer(s) shall submit a report to the building official, indicating the scope of review performed and the findings of that review.

421.4 Mitigation. Risks identified in the risk assessment shall be mitigated in an approved manner. Acceptable mitigation shall include measures to reduce the risk, or the acceptance of the risk as reasonable or unavoidable.

Reason: This proposal was developed by a broad industry coalition that included participation by the National Council of Structural Engineering Associations, the Structural Engineering Institute of the American Society of Civil Engineers, the American Institute of Architects, the American Concrete Institute, the American Forest & Paper Association, the American Iron and Steel Institute, the American Institute of Steel Construction, the Masonry Alliance for Codes and Standards, The Masonry Society, the Portland Cement Association, the Steel Joist Institute, the Precast/Prestressed Concrete Institute. Corresponding members included the International Code Council and the National Fire Protection Association. In addition, there was nonvoting participation by the National Institute of Building Sciences, and the National Institute of Standards and Technology.

The terrorist attacks on Oklahoma City's Alfred P. Murrah Building, New York's World Trade Center and the Pentagon have made it clear that persons and groups with political agendas, both domestic and foreign, will attempt attacks against government and financial centers, and iconic and other buildings and structures that will render a graphic and large statement about their causes. Federal agencies, as well as many state and local governments and some private developers have adopted policies of requiring new buildings and structures to be constructed with safeguards against possible attacks. These safe guards take many forms and include such things as siting, enhanced structural design requirements, increased security including access restrictions, monitoring, and inspections; and protection of ventilation systems, to name just a few.

In developing this proposal, the coalition was confronted with the many difficulties associated with setting prescriptive minimum criteria for the design of buildings to protect against attack. Not the least of these is that terrorists are clever and quite capable of developing weapons and methods of attack that are capable of overwhelming any prescriptive criteria placed in building codes or otherwise maintained in the public record. The second is that the factors and characteristics that place a particular building at higher risk of attack than other structures are complex and vary greatly from community to community and even from neighborhood to neighborhood

Recognizing this, many government agencies and some private owners have resorted to building-specific risk assessments as a means of identifying appropriate protective measures for individual buildings and structures. These risk assessments might take into consideration a wide assortment of factors such as the location of the building, its occupancy and function, the ownership, the tenants, the site, the surrounding community, and the architectural design. The risks considered within the assessment may go well beyond code prescribed risks and include such risks as intentional attacks with weapons, collateral effects of attacks on neighboring properties, accidental explosions, biological or chemical attacks, car/truck/train impact and other low-probability events. Commonly included with a risk assessment is a recommended program of strategies that are deemed appropriate to reduce the effect of the assessed risks. For some risks addressed in the assessment an appropriate strategy may be to take accept the risk without further action, due to the cost or other unfavorable consequences of attempting to reduce the risk.

This proposal requires such risk assessments for those few structures that could be a target of attack in any community due to their size (over 420 feet in height and an occupant load greater than 5,000) or large occupant load (an occupancy load greater than 10,000). It also provides the opportunity for building officials and other authorities having jurisdiction to designate those special structures, which in their communities, also could be potential targets of attack. The proposal does not specify specific protective measures. Rather, it is intended that the design team, owner and building official will work in a collaborative manner to identify those risks that are significant to the particular building or structure and to take appropriate measures to mitigate these risks.

The proposal requires that documentation of the risk assessment, upon completion and acceptance be returned to the building owner, who may at his discretion, destroy these, so that a public record does not exist of the design criteria, and hence so that terrorists may not have access to the design basis for a building or identification of its vulnerabilities.

Cost Impact: For the overwhelming majority of buildings and structures, this proposal will have no impact on cost. For those relatively few buildings and structures that are designated as requiring a risk assessment, the cost of the assessment itself will result in a small increase in design costs. To the extent that mitigation measures are identified and included in the design, it will increase construction costs, to an extent that will be different for each affected structure.

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

G109–07/08
421 (New), 202 (New), Chapter 35 (New); IRC R325 (New), Chapter 43 (New)

Proponent: Marc Levitan, LSU Hurricane Center, representing the ICC/NSSA Storm Shelter Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add new text as follows:

SECTION 421
STORM SHELTERS

421.1 General. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

421.1.1 Scope. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

421.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

STORM SHELTER. A building, structure, or portions(s) thereof, constructed in accordance with ICC-500 and designated for use during a severe wind storm event such as a hurricane or tornado.

Community Storm Shelter. A storm shelter not defined as a Residential Storm Shelter.

Residential Storm Shelter. A storm shelter serving occupants of dwelling units and having an occupant load not exceeding 16 persons.

2. Add new definition as follows:

SECTION 202
DEFINITIONS

STORM SHELTER. See Section 421.2

3. Add standard to Chapter 35 as follows:

ICC
ICC 500-08 ICC/NSSA Standard on the Design and Construction of Storm Shelters

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

SECTION R325
STORM SHELTERS

R325.1 General. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

2. Add standard to Chapter 43 follows:

ICC
ICC 500 -08 ICC/NSSA Standard on the Design and Construction of Storm Shelters

Reason: These proposed changes to the IBC are intended to bring the new ICC Storm Shelter standard into the code as a referenced document for the construction of storm shelters. This standard establishes minimum requirements for structures and spaces designated as hurricane, tornado, or combination shelters. The standard addresses the design of such shelters from the perspective of the structural requirements for high wind conditions, as well as addressing minimum requirements for the interior environment during a storm event. A companion change is being proposed for the IRC.

Cost Impact: This code change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ICC 500-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

PART I – IBC GENERAL

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

PART II – IRC BUILDING/ENERGY

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

G110–07/08
Chapter 5

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise as follows:

CHAPTER 5
GENERAL BUILDING ~~HEIGHTS AND AREAS~~ COMPARTMENTATION AND HEIGHT

501.1 Scope. The provisions of this chapter control the height and ~~area of~~ the type and number of fire compartments within all structures hereafter erected and additions to existing structures

[F] 501.2 (Supp) Address identification. New and existing buildings shall be provided with approved address numbers or letters. Each character shall be a minimum 4 inches (102 mm) high and a minimum of 0.5 inch (12.7 mm) wide. They shall be installed on a contrasting background and be plainly visible from the street or road fronting the property. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other approved sign or means shall be used to identify the structure.

SECTION 502
DEFINITIONS

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AREA, ~~BUILDING~~ FIRE COMPARTMENT. The area included within surrounding exterior walls, compartment walls, (or exterior walls and firewalls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the ~~building~~ fire compartment area if such areas are included within the horizontal projection of the roof or floor above.

(Supp) BASEMENT. A story that is not a story above grade plane (See "Story above grade plane" in Section 202).

EQUIPMENT PLATFORM. An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs and ladders necessary to access the platform (see Section 505.5).

FIRE COMPARTMENT. An area enclosed and bounded by fire walls, fire barrier walls, exterior walls, or fire-resistance-rated horizontal assemblies of a building.

GRADE PLANE. A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829 mm) from the building.

HEIGHT, BUILDING. The vertical distance from grade plane to the average height of the highest roof surface.

MEZZANINE. An intermediate level or levels between the floor and ceiling of any story and in accordance with Section 505.

SECTION 503
GENERAL HEIGHT AND FIRE COMPARTMENT AREA LIMITATIONS

503.1 (Supp) General. The height and maximum area of any fire compartment and the number of fire compartments in a buildings shall not exceed the limits specified in Tables 503.1(1), 503.1(2), 503.1(3) and 503.1(4) based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more fire walls complying with Section 705 shall be considered to be a separate building.

(Delete existing Table 503 entire in its entirety and replace with Tables 503.1(1) through 503.1(4))

~~**TABLE 503**~~
~~**ALLOWABLE HEIGHT AND BUILDING AREASa**~~
~~**Height limitations shown as stories and feet above grade plane.**~~
~~**Area limitations as determined by the definition of "Area, building," per story**~~

Table 503.1(1)
MAXIMUM BUILDING HEIGHT (Feet and Stories)

OCCUPANCY	TYPE IA	TYPE IB	TYPE IIA	TYPE IIB	TYPE IIIA	TYPE VA	TYPE IV	TYPE IIIB	TYPE VB
Feet	UL	160	65	55	65	50	65	55	40
A-5	UL	UL	UL	UL	UL	UL	UL	UL	UL
S-2	UL	11	5	4	4	5	5	4	2
F-2	UL	11	5	3	4	3	5	3	2
B	UL	11	5	4	5	3	5	4	2
R-1, R-2, R-4	UL	11	4	4	4	3	4	4	2
R-3	UL	11	4	4	4	3	4	4	3
M	UL	11	4	4	4	3	4	4	1
F-1	UL	11	4	2	3	2	4	2	1
S-1	UL	11	4	3	3	3	4	3	1
A-3, A-4	UL	11	3	2	3	2	3	2	1
M	UL	11	4	4	4	2	4	4	1
A-2	UL	11	3	2	3	2	3	2	1
I-1	UL	9	4	3	4	3	4	3	2
H-4	UL	7	5	3	5	3	5	3	2
H-3	UL	6	4	2	4	2	4	2	1
U	UL	5	4	2	3	2	4	2	1

OCCUPANCY	TYPE IA	TYPE IB	TYPE IIA	TYPE IIB	TYPE IIIA	TYPE VA	TYPE IV	TYPE IIIB	TYPE VB
A-1	UL	5	3	2	3	2	3	2	1
I-4	UL	5	3	2	3	1	2	3	1
E	UL	5	3	2	3	1	3	2	1
H-5	4	4	3	3	3	3	3	3	2
I-2	UL	4	2	1	1	1	1	NP	NP
I-3	UL	4	2	1	2	2	2	1	1
H-2	UL	3	2	1	2	1	2	1	1
H–1	1	1	1	1	1	1	1	1	NP

UL = unlimited in height
NP = not permitted

TABLE 503.1(2)
MAXIMUM AREA PER FIRE COMPARTMENT (sf) - WITHOUT SPRINKLERS [a, b]

OCCUPANCY	TYPE IA/IB	TYPE IIA	TYPE IIIA	TYPE IV AND VA	TYPE IIB AND IIIB	TYPE VB
S-2, F-2	30,267	16,933	16,933	10,933	7,867	4,800
A-3, A-4, B, H-4, I, R, E	26,706	14,941	14,941	9,647	6,941	4,235
A-1, A-2, M	22,700	12,700	12,700	8,200	5,900	3,600
F-1, S-1, H-5	19,739	11,043	11,043	7,130	5,130	3,130
H–1, H-2, H-3	NP	NP	NP	NP	NP	NP

a. One or more fire compartment in the building does not have an automatic fire suppression system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
b. A-5 Assembly uses intended for participation in or viewing outdoor activities shall be permitted to be unlimited in area.

NP = Not Permitted

TABLE 503.1(3)
MAXIMUM AREA PER FIRE COMPARTMENT (sf) - WITH SPRINKLERS[a, b]

OCCUPANCY	TYPE IA/IB	TYPE IIA	TYPE IIIA	TYPE IV AND VA	TYPE IIB AND IIIB	TYPE VB
S-2, F-2	722,400	290,667	290,667	172,000	130,667	82,667
A-3, A-4, B, H-4, I, R, E	637,412	256,471	256,471	151,765	115,294	72,941
A-1, A-2, M	387,000	109,000	109,000	64,500	49,000	31,000
F-1, S-1, H-5	168,261	70,139	70,139	41,504	31,530	19,948
H–1, H-2, H-3	30,960	17,440	17,440	10,320	7,840	4,960

a. All fire compartments in the building have an automatic fire suppression system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
b. A-5 Assembly uses intended for participation in or viewing outdoor activities shall be permitted to be unlimited in area.

TABLE 503.1(4)
GROSS AREA FACTOR

ACTUAL BUILDING HEIGHT, STORIES	NUMBER OF STORIES PERMITTED								
	1	2	3	4	5	6	7	8	9
1	4	8	12	16	20	24	28	32	36
2	-	6	9	12	15	18	21	24	27
3	-	-	6	8	10	12	14	16	18

503.2 Building area. The maximum allowable building area shall not exceed the maximum area of fire compartments in accordance with Tables 503.1(2) or 503.1(3) multiplied by the number in Table 503.1(4). A building shall be considered one fire compartment except where subdivided by compartment fire barriers conforming with this section.

503.2.1 Enclosure. Each fire compartment shall be enclosed by exterior walls, roof, fire rated horizontal assemblies or fire compartment barrier walls. If a building has more than one fire compartment, each fire compartment shall be separated by horizontal or vertical compartment barrier having a fire resistance rating determined in accordance with Table 503.2.2.

503.2.2 Fire compartment barriers. Fire compartment barriers separating a building into fire compartments shall comply with Sections 503.2.2.1 and 503.2.2.2 and Table 503.2.2.

TABLE 503.2.2
FIRE COMPARTMENT FIRE RESISTANCE (hrs)

	SPRINKLERED	NON-SPRINKLERED
Assembly		
A-1	1	2
A-2	1	2
A-3	1	2
A-4	1	2
A-5	NA	NA
Business		
B	1	2
Educational		
E	1	2
Factory and Industry		
F-1	2	3
F-2	1	2
Hazardous		
H-1	3	4
H-2	3	4

	SPRINKLERED	NON-SPRINKLERED
H-3	2	3
H-4	1	2
H-5	1	2
Institutional		
I-1	1	2
I-2	1	2
I-3	1	2
I-4	1	2
Mercantile		
M	1	2
Residential		
R-1	1	2
R-2	1	2
R-3	1	2
R-4	1	2
Storage		
S-1	2	3
S-2	1	2
Utility		
U	½	1

NA = Not Applicable

503.2.2.1 Horizontal fire compartment barriers. Horizontal fire compartment barriers shall be constructed in accordance with Section 711.

503.2.2.2 Vertical fire barriers. Vertical fire compartment barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, including but not limited to spaces such as above a suspended ceiling.

503.2.2.2.1 Vertical continuity. Fire compartment barriers shall extend from the foundation to the underside of the roof deck.

Exceptions:

1. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
   - 1.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
   - 1.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
   - 1.3. Each building shall be provided with not less than a Class B roof covering.

2. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire compartment barrier.
3. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks provided:
   3.1. There are no openings in the roof within 4 feet (1220 mm) of a fire wall,
   3.2. The roof is covered with a minimum Class B roof covering, and
   3.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with 5/8 inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
4. Buildings located above a parking garage designed in accordance with Section 509.2 shall be permitted to have the fire compartment barriers for the buildings located above the parking garage extend from the horizontal separation between the parking garage and the buildings.

503.2.2.2.2 Supporting construction. The supporting construction for fire compartment barrier walls shall be protected to afford the required fire-resistance rating of the fire compartment barrier supported.

Exceptions:

1. The supporting construction for a 1 hr. fire compartment barrier wall in buildings of Type IIB, IIIB and VB construction, not protected throughout by sprinklers in accordance with Section 903.3.1.1 or 903.3.1.2, shall be supported by a structure having a layer of 20 minute fire-resistance rated finish protection.
2. The supporting construction for a 1 hr. fire compartment barriers in buildings of Type IIB, IIIB and VB construction that are protected by sprinklers throughout in accordance with Section 903.3.1.1 or 903.3.1.2 shall not be required to be protected.

503.2.2.3 Glazed openings. Glazed openings in fire compartment barriers shall be limited to those in fire doors complying with 715.4.

503.2.2.4 Fire compartment doors. Doors in fire compartment barriers shall have a fire protection rating of at least 1 hour in accordance with Table 503.2.2.4. Doors in fire compartment barriers shall limit temperature rise to 450°F (250°C) when tested in accordance with NFPA 252.

TABLE 503.2.2.4
FIRE PROTECTION RATING OF DOORS IN FIRE COMPARTMENT BARRIERS (HRS)

FIRE COMPARTMENT BARRIER	DOOR IN FIRE COMPARTMENT BARRIER
1 hr.	1 hr.
2 hr.	1½ hr.
3 hr.	2 hr.

503.2.2.5 Other openings fire compartment barriers. Openings in 1-hour fire compartment barriers for air-handling shall be protected with fire dampers having a fire protection rating of 1 hour.

503.3 Smoke management for adjacent fire compartments. Where adjacent fire compartments share a common fire compartment wall or horizontal assembly, or both, for the purpose of creating separate fire compartments, a method of smoke management shall be provided in accordance with Section 503.3.1 for such fire compartments that meet any of the following conditions:

1. The fire compartment is not protected with an automatic sprinkler system in accordance with Section 903.3.1 and contains one or more stories located more than one story above grade plane or
2. The fire compartment contains one or more stories located more than two stories above grade plane having any of the following occupancies:
   2.1. Group A occupancy with an occupant load of 300 or more persons;
   2.2. Group I-1 occupancy; or
   2.3. Group I-2 occupancy.

503.4 Smoke management methods. Smoke management as required by Section 503.3 shall comply with any one or a combination of any of the following methods, as applicable:

1. Door openings, joints and penetrations in fire compartment separation walls and horizontal assemblies shall be protected as required for smoke barriers in accordance with the following:
   1.1. Door openings shall comply with Section 715.4.3.1.
   1.2. Penetrations shall comply with Section 712.5.
   1.3. Joints shall comply with Section 713.6.
   1.4. Ducts and air transfer openings shall comply with Section 716.5.5.
2. Openings in fire compartment separation horizontal assemblies shall be protected by shaft enclosures in accordance with Section 707. For the purpose of smoke management at fire compartment separations, Section 707.2 shall not apply.
3. Exit stair enclosures penetrating a fire compartment separation horizontal assembly shall be protected as for smokeproof enclosures in accordance with Section 909.20.
4. One or more of the following mechanical methods shall be permitted to be used for smoke management in lieu of Items 1 and 2 above:
   4.1. The pressurization method in accordance with Section 909.6
   4.2. The air flow design method in accordance with Section 909.7 for buildings protected by an automatic sprinkler system in accordance with Section 903.3.1
   4.3. The exhaust method in accordance with Section 909.8 for buildings protected by an automatic sprinkler system in accordance with Section 903.3.1

~~**503.1.1**~~ **503.5 Special industrial occupancies.** Buildings and structures designed to house special industrial processes that require large areas and unusual heights to accommodate craneways 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(1) through 503.1(3).

~~**503.1.2**~~ **503.6 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 maximum area of fire compartments ~~area of buildings~~ are within the limitations of Table ~~503~~ 503.1(1) through 503.1(3) 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**~~ **503.7 Type I construction.** Buildings of Type I construction permitted to be of unlimited tabular heights ~~and areas~~ or number of fire compartments are not subject to the special requirements that allow unlimited fire compartments ~~area buildings~~ in Section 507 or unlimited height in Sections 503.5~~1.1~~ and 504.3 or increased height and areas for other types of construction.

SECTION 504
HEIGHT

504.1 General. The height permitted by Table 503.1(1) shall be increased in accordance with this section.

Exception: The height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503.1(1) 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 503.1(1) for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.1. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable height if of combustible materials (see Chapter 15 for additional requirements).

SECTION 505
MEZZANINES

505.1 General. A mezzanine or mezzanines in compliance with Section 505 shall be considered a portion of the story below. Such mezzanines shall not contribute to either the ~~building~~ fire compartment area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area defined in Section 702. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

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 503.5~~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 and an approved emergency voice/alarm communication system in accordance with Section 907.2.12.2.

505.3 Egress. Each occupant of a mezzanine shall have access to at least two independent means of egress where the common path of egress travel exceeds the limitations of Section 1014.3. Where a stairway provides a means of exit access from a mezzanine, the maximum travel distance includes the distance traveled on the stairway measured in the plane of the tread nosing. Accessible means of egress shall be provided in accordance with Section 1007.

Exception: A single means of egress shall be permitted in accordance with Section 1015.1.

505.4 (Supp) Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In other than Groups H and I occupancies no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

505.5 (Supp) Equipment platforms. Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area in accordance with Section 903. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

505.5.1 Area limitations. The aggregate area of all equipment platforms within a room shall not exceed two-thirds of the area of the room in which they are located. Where an equipment platform is located in the same room as a mezzanine, the area of the mezzanine shall be determined by Section 505.2 and the combined aggregate area of the equipment platforms and mezzanines shall not exceed two-thirds of the room in which they are located.

[F] 505.5.2 Fire suppression. Where located in a building that is required to be protected by an automatic sprinkler system, equipment platforms shall be fully protected by sprinklers above and below the platform, where required by the standards referenced in Section 903.3.

505.5.3 Guards. Equipment platforms shall have guards where required by Section 1013.1.

~~SECTION 506~~
~~AREA MODIFICATIONS~~

~~**506.1 General.** The areas limited by Table 503 shall be permitted to be increased due to frontage *(I_f)* and automatic sprinkler system protection *(I_s)* in accordance with the following:~~

~~$$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\}$$~~ **~~(Equation 5-1)~~**

~~where:~~

~~A_a = Allowable area per story (square feet).~~
~~A_t = Tabular area per story in accordance with Table 503 (square feet).~~
~~I_f = Area increase factor due to frontage as calculated in accordance with Section 506.2.~~
~~I_s = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.~~

~~**506.2 Frontage increase.** Every building shall adjoin or have access to a public way to receive an area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a minimum width of 20 feet (6096 mm), the frontage increase shall be determined in accordance with the following:~~

~~$$I_f = [F / P - 0.25]W / 30$$~~ **~~(Equation 5-2)~~**

~~where:~~

~~I_f = Area increase due to frontage.~~
~~F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).~~
~~P = Perimeter of entire building (feet).~~
~~W = Width of public way or open space (feet) in accordance with Section 506.2.1.~~

~~**506.2.1 (Supp) Width limits.** The value of *W* shall be at least 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of *W* is greater than or equal to 20 feet (6096 mm). Where the value of *W* exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space.~~

~~**Exception:** The value of *W* divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.~~

~~**506.2.2 Open space limits.** Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved fire lane.~~

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

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

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

~~**506.4 (Supp) 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 this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.~~

~~**Exception:** A single basement 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.~~

~~**506.4.1 (Supp) 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.~~

~~**506.4.1.1 (Supp) 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.~~

SECTION ~~507~~ 506
FIRE COMPARTMENTS PERMITTED TO BE UNLIMITED IN AREA ~~BUILDINGS~~

~~**507.1** **506.1** **General.** The area of a fire compartment shall not be limited and only one fire compartment is required in buildings meeting the requirements of Sections 506~~7~~.2 through 506~~7~~.11. ~~The area of buildings of the occupancies and configurations specified herein shall not be limited.~~

~~**507.2** **506.2** **(Supp) Nonsprinklered, one story.** The area of the fire compartment in a Group F-2 or S-2 occupancy ~~building~~ no more than one-story in height, shall not be limited when the building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

~~**507.3** **506.3** **(Supp) Sprinklered, one story.** The area of the fire compartment in a Group B, F, M or S occupancy ~~building~~ no more than one-story above grade plane, or the fire compartment in a Group A-4 occupancy ~~building~~ no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) n width.

Exceptions:

1. ~~Buildings and~~ The fire compartment in structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such ~~buildings~~ fire compartment conform to the requirements of Sections 506~~7~~.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in ~~areas~~ parts of fire compartments that are occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:

2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
2.2. The ~~building~~ fire compartment is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.

3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
3.1. All assembly occupancies are separated from other spaces as required for separated occupancies in Section 508.4.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
3.3. All required exits shall discharge directly to the exterior.

~~507.4~~ 506.4 (Supp) Two story. The area of the fire compartment in a Group B, F, M or S occupancy ~~building~~ no more than two stories above grade plane shall not be limited when the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

~~507.5~~ 506.5 Reduced open space. The permanent open space of 60 feet (18 288 mm) required in Sections 507.2, 507.3, 507.4, 507.6 and 507.10 shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the building.
2. The exterior wall facing the reduced open space shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior wall facing the reduced open space shall have opening protectives with a minimum fire protection rating of 3 hours.

~~507.6~~ 506.6 (Supp) Group A-3 buildings. The area of the fire compartment in a Group A-3 occupancy ~~building~~ no more than one-story above grade plane, used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited when all of the following criteria are met:

1. The fire compartment ~~building~~ shall not have a stage other than a platform.
2. The fire compartment ~~building~~ shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

~~507.7~~ 506.7 (Supp) Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area fire compartments ~~buildings~~ containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the limitations of this section. The aggregate floor area of the Group H occupancies located at the perimeter of the unlimited area fire compartment ~~building~~ shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Tables 503.1(2) and 503.1(3) ~~as modified by Section 506.2~~, based upon the percentage of the perimeter of each Group H floor area that fronts on a street or other unoccupied space. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the fire compartment area limitations for the Group H occupancies as specified in Tables 503.1(2) and 503.1(3). Group H occupancies shall be separated from the rest of the unlimited area building and from each other in accordance with Table 508.4. For two-story unlimited area fire compartments ~~buildings~~, the Group H occupancies shall not be located more than one story above grade plane unless permitted by the allowable height in stories and feet as set forth in Table 503.1(1) based on the type of construction of the unlimited area building.

~~507.8~~ 506.8 (Supp) Aircraft paint hangar. The area of the fire compartment for a Group H-2 aircraft paint hangar no more than one-story above grade plane, shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

~~507.9~~ 506.9 (Supp) Group E buildings. The area of the fire compartment for a Group E occupancy ~~building~~ no more than one-story above grade plane, of Type II, IIIA or IV construction shall not be limited when the following criteria are met:

1. Each classroom shall have not less than two means of egress, with one of the means of egress being a direct exit to the outside of the building complying with Section 1018.
2. The fire compartment ~~building~~ is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The fire compartment ~~building~~ is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

~~507.10~~ 506.10 (Supp) Motion picture theaters. In fire compartment ~~buildings~~ of Type II construction, the area of the fire compartment for a motion picture theater located on the first story above grade plane shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

~~507.11~~ 506.11 Covered mall buildings and anchor stores. The area of the fire compartment for a covered mall buildings and anchor stores not exceeding three stories in height that comply with Section 402.6 shall not be limited.

SECTION ~~508~~ 507
MIXED USE AND OCCUPANCY

~~508.1~~ 507.1 (Supp) General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a separate and detached building or structure.
3. Live/Work Units in accordance with Section 419 are not considered separate occupancies.

~~508.2~~ 507. 2 (Supp) Accessory occupancies Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.5.3.

~~508.2.1~~ 507.2.1 (Supp) Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Tables 503.1(2) and 503.1(3), ~~without area increases in accordance with Section 506 for such accessory occupancies~~

~~508.2.2~~ 507.2.2 (Supp) Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.

~~508.2.3~~ 507.2.3 (Supp) Allowable area and height. The allowable area of the fire compartment and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503.1(1), without increases in accordance with Section 504 for such accessory occupancies. The area of the accessory occupancies shall be in accordance with Section 508.2.1

~~508.2.4~~ 507.2.4 (Supp) Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section 508.2.5.
3. Group R occupancies shall be separated from other accessory occupancies in accordance with Section 508.4.4

~~508.2.5~~ 507.2.5 (Supp) Separation of incidental accessory occupancies. The incidental accessory occupancies listed in Table 508.2.5 shall be separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table 508.2.5.

Exception: Incidental accessory occupancies within and serving a dwelling unit are not required to comply with this section.

TABLE ~~508.2.5~~ 507.2.5 (Supp)
INCIDENTAL USE AREAS

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cut-off rooms, not classified as Group H	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing system
Laboratories and vocational shops, not classified as Group H, located in Group E or I-2 occupancies	1 hour or provide automatic fire-extinguishing system
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Stationary storage battery systems having a liquid capacity of more than 100 gallons used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch = 6.9 kPa,
1 British thermal unit per hour = 0.293 watts, 1 horsepower = 746 watts,
1 gallon = 3.785 L.

~~508.2.5.1~~ 507.2.5.1 (Supp) Fire resistance rated separation. Where Table 508.2.5 specifies a fire-resistance rated separation, the incidental accessory occupancies shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

~~508.2.5.2~~ 507.2.5.2 (Supp) Nonfire-resistance rated separation and protection. Where Table 508.2.5 permits an automatic fire extinguishing system without a fire barrier, the incidental accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the fire-resistance-rated floor/ceiling assembly above or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

~~508.2.5.3~~ 507.2.5.3 (Supp) Protection. Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2.5, only the space occupied by the incidental accessory occupancy need be equipped with such a system.

~~508.3~~ 507.3 (Supp) Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

~~508.3.1~~ 507.3.1 (Supp) Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the building or portion thereof in which the nonseparated occupancies are located.

~~508.3.2~~ 507.3.2 (Supp) Allowable fire compartment area and height. The allowable fire compartment area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

~~508.3.3~~ **507.3.3 (Supp) Separation.** No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.
2. All Group R occupancies shall be separated from other occupancies in accordance with Section 508.4.4.

~~508.4~~ **507.4 (Supp) Separated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.

TABLE ~~508.4~~ 507.4 (Supp)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I		R[c]		F-2, S-2[b,c], U[c]		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E[d]	N	N	1	2	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I	--	--	N	N	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
R[c]	--	--	--	--	N	N	1	2	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b,c], U[d]	--	--	--	--	--	--	N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2[a]
H-1	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP
H-3, H-4, H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

~~508.4.1~~ **507.4.1 (Supp) Occupancy classification.** Separated occupancies shall be individually classified in accordance with Section 302.1. Each separated space shall comply with this code based on the occupancy classification of that portion of the building.

~~508.4.2~~ **507.4.2 (Supp) Allowable fire compartment area.** In each story, the ~~building~~ fire compartment area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable area of each separated occupancy fire compartment shall not exceed one.

~~508.4.3~~ **507.4.3 (Supp) Allowable height.** Each separated occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section 509.

~~508.4.4~~ **507.4.4 (Supp) Separation.** Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

~~508.4.4.1~~ **507.4.4.1 (Supp) Construction.** Required separations shall be fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies.

SECTION ~~509~~ 508
SPECIAL PROVISIONS

~~509.1~~ 508.1 (Supp) General. The provisions in this section shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights and areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code. The provisions of Sections 509.2 through 509.8 are to be considered independent and separate from each other.

~~509.2~~ 508.2 (Supp) Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining fire compartment area limitations, continuity of fire walls, limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. The building below the horizontal assembly is no more than one story above grade plane
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

   Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

   1. The building above the horizontal assembly is not required to be of Type I construction;
   2. The enclosure connects less than four stories; and
   3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.

5. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
6. The building below the horizontal assembly shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:

   1. Group S-2 parking garage used for the parking and storage of private motor vehicles;
   2. Multiple Group A, each with an occupant load of less than 300;
   3. Group B;
   4. Group M;
   5. Group R; and
   6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).

7. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

~~509.3~~ 508.3 (Supp) Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage with no more than one story above grade plane and located below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction where the following conditions are met:

1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.0.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire resistance requirements of the Group S-2 open parking garage.
3. The height and the number of tiers of the Group S-2 open parking garage shall be limited as specified in Table 406.3.5.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m_2), and mechanical equipment rooms incidental to the operation of the building.

~~509.4~~ **508.4 Parking beneath Group R.** Where a maximum one-story above grade plane Group S-2 parking garage, enclosed or open, or combination thereof, of Type I construction or open of Type IV construction, with grade entrance, is provided under a building of Group R, the number of stories to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a fire-resistance rating not less than the mixed occupancy separation required in Section 508.3.3.

~~509.5~~ **508.5 (Supp) Group R-1 and R-2 buildings of Type IIIA construction.** The height limitation for buildings of Type IIIA construction in Groups R-1 and R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first-floor construction above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m_2).

~~509.6~~ **508.6 (Supp) Group R-1 and R-2 buildings of Type IIA construction.** The height limitation for buildings of Type IIA construction in Groups R-1 and R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first-floor construction has a fire-resistance rating of not less than $1^1/_2$ hours.

~~509.7~~ **508.7 Open parking garage beneath Groups A, I, B, M and R.** Open parking garages constructed under Groups A, I, B, M and R shall not exceed the height and area limitations permitted under Section 406.3. The height and fire compartment area of the portion of the building above the open parking garage shall not exceed the limitations in Section 503 for the upper occupancy. The height, in both feet and stories, of the portion of the building above the open parking garage shall be measured from grade plane and shall include both the open parking garage and the portion of the building above the parking garage.

~~509.7.1~~ **508.7.1 Fire separation.** Fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711 between the parking occupancy and the upper occupancy shall correspond to the required fire-resistance rating prescribed in Table 508.3.3 for the uses involved. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking structure, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. Means of egress for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by fire barriers having at least a 2-hour fire-resistance rating as required by Section 706 with self-closing doors complying with Section 715 or horizontal assemblies having at least a 2-hour fire-resistance rating as required by Section 711, with self-closing doors complying with Section 715. Means of egress from the open parking garage shall comply with Section 406.3.

~~509.8~~ **508.8 (Supp) Group B or M with Group S-2 open parking garage below**. Group B or M occupancies located no higher than the first story above grade plane shall be considered as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a minimum 2-hour fire-resistance rating.
2. The occupancies in the building below the horizontal assembly are limited to Groups B and M.
3. The occupancy above the horizontal assembly is limited to a Group S-2 open parking garage.
4. The building below the horizontal assembly is of Type I or II construction but not less than the type of construction required for the Group S-2 open parking garage above.
5. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503.
6. The height and area of the Group S-2 open parking garage does not exceed the limits set forth in Section 406.3. The height, in both feet and stories, of the Group S-2 open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly.
7. Exits serving the Group S-2 open parking garage discharge directly to a street or public way and are separated from the building below the horizontal assembly by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

~~509.9~~ **508.9 (Supp) Multiple buildings above an enclosed or open Group S-2 parking garage.** Where two or more buildings are provided above the horizontal assembly separating a Group S-2 open or closed parking garage from the buildings above in accordance with the special provisions in Sections 509.2 and 509.3, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Reason: At the Orlando 2006 Code Development Hearing, the Height and Area Study Group (now renamed the CTC Balanced Fire Protection Features Study Group) was formed for the purpose of examining the contentious Height and Area code proposals in a more comprehensive way than the code hearing itself could provide.

We started with a review of the legacy code consolidation and IBC development. The foundation of that process was the concept that as the IBC began to be adopted across the previous regional boundaries the new code would not generally create non-conforming buildings in entire legacy code regions. The starting point was that for each occupancy and construction type, the largest maximum allowable area in any one of the codes should be the prevailing value. Once that area was determined, then the Table 503 tabular values could be reverse-calculated to meet the non-conforming objective.

The Study Group debated this approach and reconstructed Table 503 independently. At the conclusion of that effort, we discovered that 48 of the 225 cells in Table 503 did not meet the "largest maximum area" statement in that the building areas were larger than any legacy code, while 10 cells were smaller than any of the legacy codes.

We then asked ourselves: "Is the best way to address this issue and the others on our list to work at revising the table and modifiers, or to look at the bigger question of building safety in a more comprehensive way?"

We concluded that the better approach for us to develop and present to the membership was the latter, and we changed gears from a historically-focused approach focused strictly on height and area to a forward-looking one that asked "What can we do to improve building safety using the concepts of balanced fire protection?"

To address building safety holistically and to efficiently incorporate changing technology, we are better served to make a significant shift in Chapter 5 (Height and Area) and incorporate a conceptual approach that meets the following goals:

- Create buildings that meet an acceptable level of safety for communities, occupants and emergency responders.
- Describe methods, materials, and systems that are flexible enough to adapt to a differing community conditions, changing materials and methodologies, and individual building needs.
- Design a building code that is simple, straightforward, and understandable.

Supporting Concepts

"Building Safety" is defined as the aggregate features in a building that are provided to protect structures, occupants and emergency responders, and property from losses associated with anticipated hazards, primarily from fire and collapse.

The goal of building safety is best achieved through the interaction of all the hazard mitigation processes (Active and Passive and Emergency Response) to produce an/the acceptable level of risk (level of safety). Building safety success can be defined as meeting the goals of life and property loss that are acceptable and economically supportable. This is the core concept of acceptable risk.

Acceptable building safety risk is that level of loss that each entity impacted can accept if a hazardous event occurs. It is created by aggregating the hazards and adjusting mitigations to create the agreed upon risk level. It can be measured as a quantitative value, qualitative value, or both. On a national scale and state scale, this loss is currently represented by national death and property loss figures. On a community scale, this is usually represented by the community loss goals and economic "scale" measured against the cost of providing an emergency prevention and response system. On an individual level, acceptable risk is a often a contractual condition between a building owner/occupant and an insurance provider.

Compartmentation Approach

The ICC CTC BFP Study Group debated the origins and basis of the height and area tables in the legacy codes, as well as the current IBC, attempting to identify some rational basis and evolution related to the stated goals of the codes. The lengthy exercise proved informative yet futile in meeting this objective, although the disparity in positions related to the current table's interpretation and application became more obvious and focused. This also resulted in some short term fixes being proposed to address concerns expressed about the table and identified the need to develop a long term resolution of the issue.

As a result, the Study Group looked for an alternate approach that is both rational and can stand the test of time in terms of flexibility to accommodate the code development process, as well as meet defined goals of life safety, firefighter safety, property protection, and social and environmental demands (community disruption, loss of jobs, homelessness, tax base erosion, business interruption, environmental needs, etc.).

The discussion shifted from overall building size to what is necessary to meet the above goals and specific building elements/systems having a significant impact on the stated goals were identified and agreed upon:

- compartmentation
- exiting
- smoke management
- automatic sprinklers
- fire-resistive construction
- structural integrity
- improved inspection and maintenance programs

Compartmentation became the basis of this effort with the other elements/ systems influencing the compartment's characteristics. This approach was chosen as it is based on a rational analysis of fire containment which takes into consideration the ability of the responding fire department to control and extinguish a fire within the compartment while performing search and rescue and evacuation assistance operations. We believe it is supportable when considered from a rational assessment perspective that includes such factors as technical soundness, appropriate and valid fire data, scientific basis, field experience, cost effectiveness, and the needs of stakeholders. Specifically, the compartment is intended to keep a fire to a manageable size for the responding fire department, with or without fire sprinkler protection, limit the spread of smoke, and provide a level of redundancy to help limit loss potential.

FIRE FLOW

The CTC Features Study Group developed the shortened table of allowable compartment areas based on assumptions about available fire flow, fire ignition and development hazards of specific occupancies, and the allowable range of area increases for fire sprinkler protection area related to the impact of reductions in required fire flow.

The base table values for occupancy compartment size without fire sprinkler protection are based on the minimum fire flow for total building area tabulated in Appendix B of the International Fire Code for commercial structures (1,500 gpm). It should also be noted that 1,500 gpm is the basic fire flow used in the Insurance Services Office (ISO) rating system. The use of 1,500 is predicated on an assumption that a first alarm complement of fire apparatus and firefighters from most mid-size and larger cities and towns are capable of deploying this flow via a combination of hand-lines and master streams (ground monitors or aerial streams). The fire flow table is independent of occupancy. Therefore the base areas from Table B105.1 were then adjusted up or down based on the occupancy hazard factors from the ISO process.

For the areas of compartments within buildings protected by fire sprinklers, the Study Group believed it prudent to encourage sprinkler protection by starting with a base area allowed for a larger fire flow. Sprinkler protection should allow for the extended time necessary to assemble the resources to develop a larger fire flow. As with buildings without sprinkler protection, the base area was adjusted using the occupancy hazard factors from the ISO process. The last adjustment for the proposed table was for sprinkler protection. The IFC allows the required fire flow to be

reduced by up to 75%. An evaluation of Table B105.1 values will demonstrate that a 50% reduction in required fire flow will permit a ~3.7 times area increase. A 60% reduction in required fire flow would result in a ~5 times area increase. A 70% decrease in required fire flow would result in a ~10 times area increase. Finally a 75% reduction in required fire flow would result in a ~14 times area increase. The entire range of increases was used based on construction type (contribution to fuel load) and occupancy hazard. No sprinkler related increases were proposed for H1, H2, and H3 occupancies.

SMOKE COMPARTMENTATION

An important component of providing safety for occupants in a building is to limit the spread of smoke from a fire to other portions of the building. While the BFP Features Study Group felt fire barrier construction would be sufficient to limit the spread of smoke in most cases, we recognized there are some cases where the occupants are more vulnerable and need extra protection, either because they are expected to be defended in place, or because more time is needed to evacuate.

Addressing the specific provisions:

1. These requirements only apply where fire compartments abut each other, not to walls or floors within the fire compartment. (See charging paragraph in Section 503.3.) Smoke migration within the compartment is addressed by other current code requirements.
2. Buildings with non-sprinklered two-story compartments will require smoke management, since there is nothing to slow the fire from producing more smoke. However, single story compartments that are located at the first story are exempt, since the occupants are able to readily escape. (See Section 503.3, Item 1 and Item 2.)
3. Where a Group A occupancy with 300 or more occupants, a Group I-1, or a Group I-2 occupancy is located on the 3rd story above grade plane or higher, smoke management will be required. This recognizes that occupancies with more vulnerable populations should be better protected from smoke and the increased risk of being above grade. Three stories was chosen as the threshold in recognition that the code generally allows two stories to be open to each other, allowing smoke migration between the stories. (See Section 503.3, Item 2)
4. Section 503.4.1 lays out what constitutes "smoke management." It is recognized that rated floor and wall construction generally provides adequate protection for the passage of smoke. The goal of this proposal is to limit smoke migration through openings in the fire-resistance rated assemblies that define the fire compartment. However, the section allows several essentially equivalent methods to accomplish the goal.
5. Section 503.4, Item 1 requires door openings, penetrations, joints, and duct and air transfer openings to be protected as for smoke barriers. Doors will be required to be smoke- and draft-control assemblies. Penetration and joint systems will need to carry a leakage rating (with an "L" label). Smoke dampers will be required for duct and air transfer openings.
6. Section 503.4, Item 2 requires shaft construction for openings in floors between compartments (for openings other than for exit stair enclosures). In this case, because an unprotected opening would allow smoke migration between compartments, none of the exceptions to shaft construction in Section 707.2 are allowed to be used.
7. Section 503.4, Item 3 allows a smokeproof enclosure to serve as one of the options to limit smoke migration through exit stairs that connect adjacent fire compartments. This could be used in lieu of providing the smoke gaskets for the doors as referred to in Section 503.4, Item 1.1. A smokeproof stair not only prevents smoke from migrating between the compartments, but also provides added protection for occupants who may be using the stairs to evacuate.
8. 1.Section 503.4, Item 4 specifies the mechanical methods that are allowed to be used as an alternative to providing the physical barriers in Items 1 and 2. A system that utilizes pressure differentials between the compartment where the fire is burning and adjacent compartments could be designed to adequately limit smoke migration. While the air flow or exhaust methods could also be designed to limit smoke migration, they are predicated on removing smoke being produced by a sprinklered fire, and are not adequate to deal with smoke migration from a non-sprinklered fire. That being the case, they are limited in this proposal to those buildings that are sprinklered.

The Features Study Group will continue work on this subject and many of the other elements of the I-Codes that affect the height and area of buildings. Further study is planned on the thresholds for fire suppression as currently determined in Chapter 9, the integration of the compartment approach to the provisions for high rise buildings will be further investigated along with other specific subjects not yet identified.

It is often difficult to isolate a groups thought on a single approach to a subject. Compartmentation as a solution has been the focus for a significant change to this subject by this group. Much of the basis for what is shown in this code change is attributable to the appendix of the IFC and the ISO fire flow calculation method. Integrating those approaches with the occupancy base in the IBC a system for determining the maximum area of a building was derived.

Cost Impact: This new approach to regulation of building height and area will not increase the cost of overall construction.

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

G111–07/08

501.1, 3403.1(IEBC [B] 302.1), 3406.1(IEBC [B] 305.1), 3410.2.3 (IEBC [B] 1301.2.3)

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

1. Revise as follows:

501.1 Scope. The provisions of this chapter control the height and area of structures hereafter erected and additions to existing structures.

Exception: Additions to existing structures shall be permitted to comply with the exceptions to Sections 3403.1, 3406.1 and 3410.2.3.

3403.1 (IEBC [B] 302.1) Existing buildings or structures. Additions or alterations to any building or structure shall comply with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus additions shall comply with the height and area provisions of Chapter 5.

Exception: An existing building plus any additions shall not be required to comply with the height and area provisions of Chapter 5 provided the existing building including additions comply with the height and area provisions of the code under which the existing building was issued a certificate of occupancy.

Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

3406.1 Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancy.

Exceptions:

1. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.
2. The existing building shall not be required to comply with the height and area provisions of Chapter 5 provided the new occupancy of the existing building complies with the height and area provisions of the code under which the existing building was issued a certificate of occupancy.

3410.2.3 (IEBC [B] 1301.2.3) Additions. Additions to existing buildings shall comply with the requirements of this code for new construction. ~~The combined height and area of the~~ An existing building plus any ~~and the new~~ additions shall ~~not exceed~~ comply with the height and area provisions of ~~allowed by~~ Chapter 5. ~~Where a fire wall that complies with Section 705 is provided between the addition and the existing building, the addition shall be considered a separate building~~.

Exception: An existing building plus additions shall not be required to comply with the height and area provisions of Chapter 5 provided the existing building including additions comply with the height and area provisions of the code under which the existing building was issued a certificate of occupancy.

Reason: Since the current height and area provisions of the International Building Code (IBC) theoretically are generally as large or larger than any of the legacy model codes, there should be no significant concern about grandfathering existing buildings with their heights and areas based upon the legacy codes. Those heights and areas, in general, should seldom exceed those currently allowed by the IBC. Therefore, grandfathering in such existing buildings is not a problem from a fire/life safety perspective in regard to enforcement of the newest edition of the IBC. In these suggested code changes, the exceptions for existing buildings heights and areas when the building area is increased or the use of the building is changed to a different occupancy allows the application of the legacy code height and area provisions that were used when the building was originally occupied and approved under that edition of the legacy code.

This "grandfathering" will also give our Study Group some flexibility in what we may decide to do to ratchet down any of the current provisions for heights and areas in Chapter 5 as an interim solution to the long term project of substituting a new concept of compartmentation using a balanced fire protection design concept, without being concerned about impacting the existing building stock throughout the country.

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

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

G112–07/08
502

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

SECTION 502
DEFINITIONS

EQUIPMENT PLATFORM. An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs, alternating tread devices and ladders necessary to access the platform (see Section 505.5).

Reason: The purpose of this proposed change to IBC-2006 is to allow the use of alternating tread devices as an access component to equipment platforms.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to equipment platforms that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 502 is overly restrictive in that it does not allow the use of alternating tread devices as an access component to equipment platforms, but does allow ladders for such use. (Or the intent of section 502 is to imply that other access components such as alternating tread devices are allowed, but this is not clearly stated).

Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Alternating tread devices have been successfully used as an access component to equipment platforms for approximately 25 years. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and size rails) are typically safer to use than vertical ladders and are suitable for the application specified in section 502. . IBC-2006 currently allows use of alternating tread devices for accesses such as to mezzanines, boiler incinerator and furnace rooms, refrigeration machinery rooms, gallery gridirons and catwalks, unoccupied roofs, etc. Also, access to equipment platforms is a primary intended use for alternating tread devices, especially since they can be used such that tools can be carried up or down the device.

Alternating tread devices were patented and 1981 and their use to equipment platforms has been allowed by the Occupational Safety and Health Administration (OSHA) since December of 1981. Alternating tread devices were allowed as an access component to equipment platforms per The BOCA National Building Code/1999 and the 1997 Uniform Building Code, which were precursor codes to IBC. Alternating tread devices are also allowed to be used as an access component to equipment platforms under NFPA-101, 2006.

Bibliography:

OHSA instruction STD 1-1.11, dated 4/26/82
Letter dated 12/2/81 from Mark Cowan (OHSA) to Dale Ordoyne (Lapeyre Stair)
Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32
The BOCA National Building Code/1999, section 2805.2.5
1997 Uniform Building Code, section 1003.3.3.1
Letter dated 10/20/87 from Tom Briggs (ICBO) to J. Robert Nelson (PFS Corp.)
NFPA-101, 2006, section 7.2.11.1 (3)
IBC-2006 sections 1009.1, 1015.3, 1015.4, 1015.6.1

Cost Impact: The code change proposal could minimally affect the cost of construction if alternating tread devices are used in lieu of ladders for access to equipment platforms.

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

G113–07/08
Table 503

Proponent: Robert J. Wills, PE, American Iron and Steel Institute

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHTS AND BUILDING AREAS[a]
Height limits shown as stories and feet above grade plane.
Area limits as determined by the definition of "Area, building", per story.

		Type of Construction								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT (feet) HGT(s)	UL	160	65	55	65	55	65	50	40
A-1	S	UL	5	3	2	3	2	3	~~2~~1	1
	A	UL	UL	15,500	~~8,500~~ 7,500	14,000	~~8,500~~ 7,500	15,000	11,500	5,500
A-2	S	UL	11	~~3~~2	~~2~~1	~~3~~2	~~2~~1	~~3~~2	~~2~~1	1
	A	UL	UL	~~15,500~~ 10,000	~~9,500~~ 7,500	~~14,000~~ 10,000	~~9,500~~ 7500	~~15,000~~ 10,000	11,500	~~6,000~~ 5,000
A-3	S	UL	11	3	2	3	2	3	~~2~~1	1
	A	UL	UL	15,500	~~9,500~~ 7,500	14,000	~~9,500~~ 7,500	15,000	~~11,500~~ 11,000	~~6,000~~ 5,500

A-4	S A	UL UL	11 UL	3 15,500	2 ~~9,500~~ 7,500	3 14,000	2 ~~9,500~~ 7,500	3 15,000	~~2~~1 11,500	1 ~~6,000~~ 5,500
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	4 23,000	~~5~~4 28,500	4 19,000	5 36,000	3 18,000	2 ~~9,000~~ 6,500
E	S A	UL UL	5 UL	3 26,500	2 ~~14,500~~ 13,000	3 23,500	2 ~~14,500~~ 13,000	3 25,500	1 18,500	1 ~~9,500~~ 9,000
F-1	S A	UL UL	11 UL	4 ~~25,000~~ 34,000	~~2~~3 ~~15,500~~ 22,500	3 ~~19,000~~ 24,000	~~2~~3 ~~12,000~~ 16,000	~~4~~5 ~~33,500~~ 50,500	2 ~~14,000~~ 10,000	1 ~~8,500~~ 9,000
F-2	S A	UL UL	11 UL	5 37,500	3 23,000	4 28,500	3 ~~18,000~~ 17,000	5 50,500	3 ~~21,000~~ 18,000	2 ~~13,000~~ 6,500
H-1	S A	1 ~~21,000~~ 8,000	1 ~~16500~~ 6,000	1 ~~11,000~~ 4,000	1 ~~7,000~~ 3,000	1 ~~9,500~~ 3,500	1 ~~7,000~~ 3,000	1 ~~10,500~~ 4,000	1 ~~7,500~~ 3,000	NP NP
H-2[d]	S A	UL ~~21000~~ 10,000	3 ~~16,500~~ 7,500	2 ~~11,000~~ 5,000	1 ~~7,000~~ 3,000	2 ~~9,500~~ 4,500	1 ~~7,000~~ 3,000	2 ~~10,500~~ 5,000	1 ~~7,500~~ 3,000	1 ~~3,000~~ 1,500
H-3[d]	S A	UL UL	6 ~~60,000~~ 28,000	4 ~~26,500~~ 12,500	2 ~~14,000~~ 6,500	4 ~~17,500~~ 8,500	2 ~~13,000~~ 6,000	4 ~~25,500~~ 12,000	2 10,000	1 ~~5,000~~ 6,500
H-4	S A	UL UL	7 UL	5 37,500	3 17,500	~~5~~4 28,500	3 ~~17,500~~ 17,000	5 36,000	3 18,000	2 6,500
H-5	S A	4 UL	4 UL	3 ~~37,500~~ 25,500	3 ~~23,000~~ 17,000	3 28,500	3 ~~19,000~~ 17,000	3 36,000	3 18,000	2 ~~9,000~~ 6,500
I-1	S A	UL UL	9 55,000	4 19,000	3 10,000	4 16,500	3 10,000	4 18,000	3 10,500	2 ~~4,500~~ 4,000
I-2	S A	UL UL	4 UL	2 ~~15,000~~ 12,000	1 ~~11,000~~ 8,500	1 ~~12,000~~ 9,500	NP NP	1 ~~12,000~~ 10,000	1 ~~9,500~~ 7,500	NP NP
I-3	S A	UL UL	4 UL	2 ~~15,000~~ 12,000	1 ~~10,000~~ 8,000	2 ~~10,500~~ 8,500	1 7,500	2 ~~12,000~~ 8,000	2 ~~7,500~~ 6,000	1 ~~5,000~~ 4,000
I-4	S A	UL UL	5 60,500	3 26,500	2 13,000	3 23,500	2 13,000	3 25,500	1 18,500	1 9,000
M	S A	UL UL	11 UL	4 21,500	4 12,500	4 18,500	4 12,500	4 20,500	~~3~~2 ~~14,000~~ 10,000	1 9,000
R-1	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 ~~7,000~~ 4,500
R-2	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 ~~7,000~~ 4,500
R-3	S A	UL UL	11 UL	~~4~~3 UL	~~4~~3 UL	~~4~~3 UL	~~4~~3 UL	~~4~~3 UL	3 UL	3 UL

R-4	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 ~~7,000~~ 4,500
S-1	S A	UL UL	11 48,000	4 26,000	3 17,500	3 26,000	3 17,500	4~~5~~ ~~25,500~~ 38,500	~~3~~2 ~~14,000~~ 10,000	1 9,000
S-2[b,c]	S A	UL UL	11 ~~79,000~~ 78,000	5 ~~39,000~~ 37,500	4~~3~~ ~~26,000~~ 17,500	4 ~~39,000~~ 28,500	4~~3~~ ~~26,000~~ 17,500	5 38,500	4~~3~~ ~~21,000~~ 18,000	2 ~~13,500~~ 9,000
U[c]	S A	UL UL	5 35,500	4 19,000	2 ~~8,500~~ 7,500	3 14,000	2 ~~8,500~~ 7,500	4 18,000	2 ~~9,000~~ 8,000	1 5,500

(Portions of footnotes not shown remain unchanged)

Reason: This code change proposal was prompted by several comments made during the public testimony in Rochester. The gist of these comments was that the IBC Occupancy Subcommittee that drafted the height and area provisions had started with an appropriate philosophy, but that industry had introduced anomalies into the process that had diverted the effort from the original objective. As one of the industry observers during many of these subcommittee drafting meetings, I don't recall industry as having that level of impact.

I'm sure many of you are familiar with the height and area drafting process and philosophy, but I will review a few points. In an ICC Building Standards article entitled "IBC: Reconciling Allowable Area Differences", Occupancy Subcommittee Chairman Dan Chudy, Ph.D and ICC Subcommittee Secretariat Bill Wall made the following observation:

"From another point of view, one might ask; which of the model codes can show the best fire- and life-safety record based on allowable area of buildings? The answer: Who knows? There is little empirical data to substantiate that one code is superior to the others is this aspect. Nevertheless, each code group can readily support their allowable area tables as providing acceptable and appropriate levels of fire and life safety. Therefore, one might conclude that all 3 of the model codes contain valid allowable area provisions, even though the values are inconsistent when compared from one code to another."

Since each code group had a level of comfort with buildings construction according to their allowable height and area tables, the Subcommittee reached the following conclusion (once again as noted by Chudy and Wall):

"The IBC Occupancy Subcommittee determined that the best approach was to compare all three model codes and identify the maximum allowable area for any given type of construction using that area as the basis for the IBC allowable area tables."

As a basic philosophy, the Subcommittee decided to determine the largest allowable aggregate building floor area for each combination of occupancy (use group) and type of construction recognized by the legacy codes. With those upper limit (but legal) building areas identified, the Subcommittee could then "back-calculate" using a common system of area and height increases for sprinklers and open perimeter to determine the appropriate basic area values for the new IBC Table 503. In theory, this approach would preserve the "largest" buildings that could potentially be built using the legacy codes. It is important to note that this only preserved one data point- the maximum allowable aggregate building area. It didn't address size of each floor plate, allowable area for single story buildings or any number of other variables that are created when the 3 different systems were merged. To execute this philosophy, the Subcommittee took the following steps:

- A matrix was created converting each of the legacy code use groups to a common IBC designation.
- A second matrix was created converting each of the legacy code type of construction classifications to a common IBC designation.
- Staff from each of the legacy codes calculated the maximum allowable building areas for each combination of use group and type of construction.
- Bill Wall combined these numerical values into a spreadsheet that showed maximum building area and number of stories for each legacy code. The spreadsheet also included the BCMC height and area values.

The matrix was used to determine the largest legacy code height and area values, and these values were used to establish the IBC Table.

Assuming that the legacy code values were calculated correctly, and that the reverse calculation method was accurately applied, we are left with 2 basic questions:

1) Was the Subcommittee's philosophy, (driven by the maximum allowable aggregate building area), an appropriate approach for the IBC development?
2) Did the Subcommittee make the appropriate conversions of use group and type of construction?

For the first question, I agree with the philosophy, but I'll leave it to the reader to reach his own conclusion. For the second question, the conversions that were used are well documented in Chudy and Wall's paper, however, there was considerable judgment required to correlate the legacy codes. These are certainly open for reconsideration, and it is possible that some of the difficulties with the acceptance of the IBC height and area provisions might be traced back to these judgments.

However, if you believe that the answer to the previous two questions is yes (and I do), then the reverse calculation of these values into IBC Table 503 should be a simple calculation exercise.

The code change I have submitted is my attempt to resurrect that "simple calculation exercise". I took the "Bill Wall spreadsheet" and ran the numbers using 3 assumptions:

- Sprinkler increases as permitted by 506.3 and 504.2.
- Frontage increases as permitted by 506.2 with W/30 as 1.0.
- Maximum building area limits as mandated by 506.4.

The results (to the best of my ability) are shown in the revised Table 503 shown in this code change proposal. While this numerical exercise reproduces large portions of the values in Table 503, there are many cells that need to be changed if the Subcommittee basic philosophy and numerical accuracy are to be believed. There are many "names" that have been used to describe these cells, including errors, inconsistencies, and anomalies. Unfortunately, these cells have become the battleground for many of our recent code hearings.

Chudy and Wall made reference to these aberrant cells:

"Even with our best attempt to identify and resolve all of the variables among the three model codes, several anomalies cropped-up in the comparison, which required individual adjustments to "fit" with the balance of the table data."

To put it simply, after the number-crunching was over, the Subcommittee applied a layer of judgment to adjust what the methodology suggested. Many, but not all, of these judgments can be observed by examining the raw numbers. I submit that we can capture and reconsider these decisions in a few basic categories.

- **Use Group A-** Clearly the legacy codes had different philosophies behind their A Use Group designations. Converting these differences into a common IBC approach was perhaps the most difficult Use Group decision the Subcommittee had to make. When the conversion was finished, it appears the Subcommittee reached two conclusions. First, the allowable areas didn't need to vary substantially for the different assembly use groups for any given type of construction. It appears that once they had a basic number for A-1 of a certain TOC, they "smoothed" that value into the cells for all A use groups of that TOC. The next decision isn't as easy to explain. For some reason, they used 9500 as the basic table value for IIB and IIIB construction rather than the calculated value of 7500. I don't recall why, but perhaps someone else can fill in the reason.
- **Use Group I-** Another Use Group with similar philosophical differences in the legacy codes was Use Group I. Looking at the table values for this occupancy, the I-1 values track the legacy codes, however, the I-2 and I-3 values are significantly different. I don't recall why.
- **Use Group H-** The H values clearly are different from the legacy code generated numbers. Once again, I don't recall why, but it appears the Subcommittee made a deliberate choice to be different. I would note that it seems the Subcommittee chose to reflect the B Use Groups values in the H-5 portion of the table. This is philosophically tracks with what several of the legacy codes did to address the H-5 risk.
- **Use Group F and S**- The IBC followed the BOCA and UBC philosophy of dividing the low and moderate risk groups within these occupancies. Conversely, the SBC had a single classification for each of these occupancies. In addition, the SBC area values were relatively large for both of these use groups. As a result, if you put the SBC areas into the matrix, the single SBC values control for many of the low and moderate cells. Effectively, this wipes out the low and moderate distinction as can be seen by looking at the table areas in the proposed Table 503. The Subcommittee decided to allow the SBC values to be used when generating the S-1 values. They then multiplied the S-1 values by 1.5 to produce the S-2 numbers. Similarly, the SBC numbers were used to create the F-2 numbers with the F-1 values a result of dividing F-2 by 1.5. I believe the concept of reflecting a 50% increase between the low and moderate hazard categories is valid. How the SBC numbers are introduced into the method are a judgment call. For this code change, I simply reproduced the basic table values without the 50% multiplier even though this eliminates the low and moderate height and area distinction.
- **Type VB-** There are a number of significant places in Table 503 where the areas for VB construction appear to exceed the raw legacy code values. The Subcommittee may have considered the BCMC areas which typically were larger for this construction type. I will leave it to others to explain the committee's thought.

When we get beyond the 5 big categories noted above, there are only a few isolated cases where the IBC Table 503 doesn't line up with the Subcommittee philosophy. For example, the (M- VA) and the (E- IIB) cells don't follow the calculation method and I have no idea why.

I'm not naïve enough to believe that this code change is acceptable. In several areas, I think is has more flaws than the existing Table. What was my purpose in submitting this?

If we have a level of agreement with the Subcommittee philosophy and their legacy code conversion decisions, it would appear to me that we could organize task groups of knowledgeable individuals focused on the 5 big categories that produced the anomalies that we are getting caught up in. If we can't accomplish this, then we need to fundamentally change our basic height and area approach. However, if we could reach a consensus on how to handle the 5 big categories above that are at the heart of the anomalies, then the current table is salvageable.

In closing, I have spent an inordinate amount of time over the last 10 years on the height and area issue. Many of you have as well. Unfortunately, I'm not convinced that our time has been well spent. If our intent was to further the life-safety objectives of the code, I believe there were more significant issues that could have been advanced rather than entrenching ourselves in this issue.

I'm convinced that the code process is made up of professionals with the best of intentions and a considerable wealth of talent. We have let the height and area issue become the battleground that is dividing those intentions and wasting our collective talents and energies. We can do better.

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

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

G114–07/08
Table 503

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
A-2	S	UL	11	3[e]	2[e]	3[e]	2[e]	3[e]	2	1
	A	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000

e. In Group A-2 occupancies the height limitation for stories above grade plane shall be reduced by 1 story for bars, taverns, night clubs, and other similar assembly occupancies where alcoholic beverages are consumed (other than restaurants).

(Portions of table and footnotes not shown remain unchanged)

Reason: There is an anomaly in the allowable story heights for Group A-2 occupancies in the International Building Code (IBC) for Types II, III, and IV construction. This is because the Group A-2 occupancy in the IBC includes restaurants which were allowed by the BOCA National Building Code (NBC) to be 1 story greater in height than night clubs and similar occupancies. This is because the BOCA NBC classified a restaurant as a Group A3 occupancy and a night club as a Group A-2 occupancy. The other two legacy codes treat the Group A occupancies based on occupant load and do not differentiate between the various types of assembly uses in the same manner that the BOCA code did and the IBC currently does. However, the other two legacy codes do differentiate assembly occupancies with fixed seating and/or a legitimate stage which are generally captured under the A-1 occupancy group of the IBC and are not applicable to this issue.

Since assembly occupancies where alcohol is consumed are considered to be a much greater fire and life safety risk, the allowable number of stories in height should be reduced as indicated to reflect what was previously allowed by the three legacy codes in order to maintain the level of fire and life safety previously achieved by those codes based on the type of construction.

Please refer to the attached tables which compare the allowable number of stories for A-2 and A-3 occupancies for the three legacy codes and the IBC. The A-2 Occupancy table shows that if one story is deducted from the IBC line for Type II, III, and IV construction, the new numbers match the maximum number of stories allowed by any of the legacy codes with the exception of Types IIB and IIIB construction for the SBCCI Standard Building Code (SBC) for occupant loads less than 1,000 occupants.

A-2/A-3 Occupancies

Comparison of Number of Stories Allowed

A-2 Occupancy

Code	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
IBC	UL	11	3	2	3	2	3	2	1
IBC Revised	UL	11	2	1	2	1	2	2	1
BOCA NBC	UL	3	2	1	2	1	2	1	1
ICBO[1] UBC	UL	12	2	1	2	1	2	2	1
ICBO[2] UBC	UL	4	2	NP	2	NP	2	2	NP
SBCCI[3] SBC	UL	UL	2	2	2	2	2	1	1
SBCCI[4] SBC	UL	UL	1	1	1	1	1	NP	NP

A-3 Occupancy

IBC	UL	11	3	2	3	2	3	2	1
BOCA NBC	UL	5	3	2	3	2	3	1	1
ICBO[1] UBC	UL	12	2	1	2	1	2	2	1
ICBO[2] UBC	UL	4	2	NP	2	NP	2	2	NP
SBCCI[3] SBC	UL	UL	2	2	2	2	2	1	1
SBCCI[4] SBC	UL	UL	1	1	1	1	1	NP	NP

Footnotes:

1- A-3 Occupant load < 300 (UBC)

2- A-2.1 Occupant load ≥ 300 with no stage (UBC)

3- A-2 Small Assembly with no stage (<1,000 occ.) (SBC)

4- A-1 Large Assembly with no stage (≥ 1,000 occ.) (SBC)

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

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

G115–07/08
Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
B	S	UL	11	5	~~4~~ 3	5	~~4~~ 3	5	3	2
	A	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

NA- Not Applicable NP- Not Permitted

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (13)	5	4	4	**5**
R*(13R)	4	4	3	**4**

* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

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

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

G116–07/08
Table 503

Proponent: Jason Thompson, PE, National Concrete Masonry Association NCMA, representing the Masonry Alliance for Codes and Standards (MACS)

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(ft) HGT(S)	UL	160	65	55	65	55	65	50	40
I-1	S	UL	~~9~~ 4	~~4~~ 2	~~3~~ 1	~~4~~ 1	~~3~~ 0	~~4~~ 1	~~3~~ 1	~~2~~ 0
	A	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	4,500

(Portions of table and footnotes not shown remain unchanged)

Reason: This code change proposal basically reduces the allowable number of stories in height for Group I-1 occupancies which house more than 16 persons on a 24 hour basis who because of age, mental disability, or other reasons live in a supervised residential environment that provides personal care services. Typical Group I-1 occupancies include residential board and care facilities, assisted living facilities, half-way houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug centers, and convalescent facilities. Furthermore, the occupants of Group I-1 occupancies are supposed to be capable of responding to an emergency situation without physical assistance from staff. However, that may not always be the case and, in fact, there could be as many as five occupants who are not capable of self-preservation legally occupying the building since that is the occupant threshold beyond which the occupancy would be classified as a Group I-2, I-3, or I-4 occupancy. Even so, during the life of these types of Group I-1 occupancies it is very likely that there will be more such occupants at any given time just because of the nature of such facilities.

In our opinion, when it comes to determining the allowable construction types for this occupancy, it would be more realistic to generally reduce the allowable number of stories to not more than those allowed for a Group I-4 occupancy but not to less than that allowed for a Group I-2 occupancy. In fact, the number of stories limitations we've proposed in this code change reflect those specified in the NFPA 101-2006 Life Safety Code except for Type IB construction. The comparable occupancy in the Life Safety Code is called a large board and care facility. We believe the Life Safety Code story height limits make sense and are reasonable. Furthermore, approximately 40 states adopt NFPA 101 at the state level. Therefore, it is very likely that in those states Group I-1 occupancy buildings have been constructed to the height limits specified in NFPA 101 for the number of allowable stories. That is because the more restrictive provision of the applicable codes would apply and the lower story limits for NFPA 101 would supersede those allowed by any of the previous legacy codes or the current IBC.

For Type IB construction we used the number of stories allowed for the I-2 occupancy (4) in the current IBC which is also one story less than that allowed for the I-4 occupancy (5). That is because the Life Safety Code allowed a greater number of stories in height (11) than even the IBC for the I-1 occupancy (9).

It is also interesting to compare the number of stories height limits proposed for the Group I-1 occupancy to those currently specified in the IBC for the I-2 and I-4 occupancies. Please refer to the following table:

Comparison of Allowable Stories in Height
Proposed for Group I-1 Occupancies
vs.
Groups I-2 and I-4 Occupancies

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(ft) HGT(S)	UL	160	65	55	65	55	65	50	40
I-1	S	UL	4	2	1	1	0	1	1	0
I-2	S	UL	4	2	1	1	NP	1	1	NP
I-4	S	UL	5	3	2	3	2	3	1	1

In terms of providing relative levels of safety for these different Group I occupancies, in the Group I-1 occupancy the occupants are spending the night, as is the case in a Group I-2 occupancy. However, in a Group I-4 occupancy, which is a day care type occupancy, the occupants do not stay over night. Thus, even though they may need assistance from staff to evacuate, they are at least awake and aware, allowing for more effective and efficient evacuation in a fire emergency than if a fire were to occur while the occupants were sleeping as in the I-1 occupancy, for example. Furthermore, in the I-1 occupancy staffing levels are very minimal, if any, so the occupants are basically left on their own to respond to a fire emergency.

For all the above reasons, we believe it is more appropriate to revise the allowable number of stories in height for the Group I-1 occupancy as proposed by this code change to reflect the relative fire and life safety risk compared to the other Group I occupancies in Table 503.

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

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

G117–07/08
Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
M	S	UL	11	4	4 2	4	4 2	4	3	1
	A	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (13)	5	4	4	**5**
R*(13R)	4	4	3	**4**

NA- Not Applicable NP- Not Permitted
* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

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

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

G118–07/08
Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
R-1	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
R-2	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
R-4	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (13)	5	4	4	**5**
R*(13R)	4	4	3	**4**

NA- Not Applicable NP- Not Permitted
* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

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

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

G119–07/08
Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
S-1	S	UL	11	4	~~3~~ 2	3	~~3~~ 2	4	3	1
	A	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (13)	5	4	4	**5**
R*(13R)	4	4	3	**4**

NA- Not Applicable NP- Not Permitted
* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-

2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

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

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

G120–07/08
Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HGT(feet) HGT(S)	UL	160	65	55	65	55	65	50	40
S-2[b, c]	S	UL	11	5	~~4~~ 3	4	~~4~~ 3	5	4	2
	A	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (13)	5	4	4	**5**
R*(13R)	4	4	3	**4**

NA- Not Applicable NP- Not Permitted
* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).
The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

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

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

G121–07/08

Table 503, 503.1.2, 504.2, 506.1, 506.2, 506.3, 506.4.1, 508.2.1, 508.2.3, 508.3.2, 508.4.2, 202

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

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Building area limitations as determined by the definition of "Area, building," per story

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m2.
A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:
   1. Section 504.2, Allowable height and story increase due to automatic sprinkler system installation.
   2. Section 506.2, Allowable building area increase due to street frontage.
   3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
   4. Section 507, Unlimited area buildings.
b. For open parking structures, see Section 406.3.
c. For private garages, see Section 406.1.
d. See Section 415.5 for limitations.

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 building area of the 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.

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the building area increase in accordance with Sections 506.2 and 506.3. For Group R

buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note d.

SECTION 506
BUILDING AREA MODIFICATIONS

506.1 General. The building areas limited by Table 503 shall be permitted to be increased due to frontage *(If)* and automatic sprinkler system protection *(Is)* in accordance with the following:

$$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\} \qquad \textbf{Equation 5-1}$$

where:
A_a = Allowable building area per story (square feet).
A_t = Tabular building area per story in accordance with Table 503 (square feet).
I_f = Area increase factor due to frontage as calculated in accordance with Section 506.2.
I_s = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

506.2 Frontage increase. Every building shall adjoin or have access to a public way to receive ~~an~~ a building area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a minimum width of 20 feet (6096 mm), the frontage increase shall be determined in accordance with the following:

$$I_f = [F / P - 0.25]W / 30 \qquad \textbf{Equation 5-2}$$

where:
I_f = Area increase due to frontage.
F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).
P = Perimeter of entire building (feet).
W = Width of public way or open space (feet) in accordance with Section 506.2.1.

506.3 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the building 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 building area limitation increases shall not be permitted for the following conditions:

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

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable building area per story (*Aa*), 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 building area per story (*Aa*), 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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.

508.2.1 (Supp) Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the building area of the story in which they are located and shall not exceed the tabular values in Table 503, without building area increases in accordance with Section 506 for such accessory occupancies.

508.2.3 (Supp) Allowable building area and height. The allowable building area and height of the building shall be based on the allowable building area and height for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The building area of the accessory occupancies shall be in accordance with Section 508.2.1

508.3.2 (Supp) Allowable building area and height. The allowable building area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.4.2 (Supp) Allowable building area. In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed one.

SECTION 202
DEFINITIONS

AREA. (for masonry) See Section 2102.1.
Bedded. See Section 2102.1.
Gross cross-sectional. See Section 2102.1.
Net cross-sectional. See Section 2102.1.

Reason: "Building area" is defined in Section 502.1. "Area" is not defined in the IBC except indirectly in Section 2102.1, which defines "bedded area," "gross cross-sectional area" and "net cross-sectional area" for applying the structural provisions of Chapter 21 on masonry construction. With respect to the nonstructural provisions of the IBC, however, "area" has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of "area" (refer to Section 201.4). A statement in the title of Table 503 makes it clear that "A" means building area per story. There are instances of "area" elsewhere in Chapter 5, however, where "building area" is intended, for example, in Section 506 on modifications to the entries in Table 503 on building area per story. The proposal makes the necessary corrections. The overall result will be that an undefined term (i.e., area) is replaced by a defined term (i.e., building area).

In Section 202, the parenthetical reference "for masonry" is added to clarify that the definition for "area" is limited in application to the provisions of Chapter 21 on masonry construction. In Item #1 of Footnote (a) at Table 503, ""height increase" is changed to "height and story increases" for consistency with Sections 504.2 and 506.3. In the notations at the bottom of Table 503, descriptions for "A" as the "building area per story" and "S" as "stories above grade plane" are added to clarify their application to the entries in Table 503.

Note that "area increase factor due to frontage" and "area increase factor due to sprinklers" in Sections 506.1 and 506.2 remain unchanged. These could be changed to "building area increase factors" but such changes are not crucial to this proposal that is, nevertheless, intended to be comprehensive. These "area increase factors" are unique to Section 506 and are terms for factors that modify building areas. They are not references to building areas.

A related proposal correlates building height in the same manner as this proposal for building area.

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

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

G122–07/08
503, 503.1, 503.1.1, 503.1.2, 503.1.3, Table 503, 504.1, 504.2, 504.3, 508.4.3

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

Revise as follows:

CHAPTER 5 (Supp)
GENERAL BUILDING HEIGHTS AND ~~BUILDING~~ AREAS

SECTION 503
GENERAL BUILDING HEIGHTS AND AREA LIMITATIONS

503.1 (Supp) General. The building height and area ~~of a building~~ 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 portion of a building separated by one or more fire walls complying with Section 705 shall be considered 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 building heights to accommodate craneways 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 building 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 building 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 building heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited building height in Sections 503.1.1 and 504.3 or increased building heights and areas for other types of construction.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND ~~BUILDING~~ AREAS[a]
Building height limitations shown ~~as stories and~~ in feet above grade plane.
Story limitations shown as stories above grade plane.
Area limitations as determined by the definition of "Area, building", per story

Group	Hgt(feet)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	~~Hst~~ Stories (S)	A	B	A	B	A	B	HT	A	B
		UL	160	65	55	65	55	65	50	40

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m^2.
UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:
   1. Section 504.2, Allowable building height increase due to automatic sprinkler system installation.
   2. Section 506.2, Allowable area increase due to street frontage.
   3. Section 506.3, Allowable area increase due to automatic sprinkler system installation.
   4. Section 507, Unlimited area buildings.
b. For open parking structures, see Section 406.3.
c. For private garages, see Section 406.1.
d. See Section 415.5 for limitations.

SECTION 504
HEIGHT

504.1 General. The building height permitted by Table 503 shall be increased in accordance with this section.

Exception: The building height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times ~~the height of the~~ building height.

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum building 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 building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.1. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable building height if of combustible materials (see Chapter 15 for additional requirements).

508.4.3 (Supp) Allowable height. Each separated occupancy shall comply with the building height limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section 509.

Reason: "Building height" is defined in Section 502.1. "Height" is not defined in the IBC. Consequently, it has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of "height" (refer to Section 201.4). There are instances of "height" in Chapter 5, however, where "building height" is intended. The proposal makes the necessary corrections. The result will be that an undefined term (i.e., height) is replaced by a defined term (i.e., building height).

The title of Table 503 is changed by specifying the building height in feet above grade plane separately from the story limitations as stories above grade plane. This change eliminates the potentially confusing reference to story limitations in terms of height. The story limitations in Table 503 are based on the number of stories above grade plane, not their height "as stories" above grade plane.

The changes from "building areas" to "areas" in the title of Chapter 5 and from "area of a building" to "area" in Section 503.1 are intended as editorial and for consistency with the references to "building height and area limitations" and "building heights and areas" in Sections 503.1.1 and 503.1.3, respectively. A related proposal correlates building area in the same manner as this proposal for building height.

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

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

G123–07/08
504.2

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Alliance for Fire and Smoke Containment and Control (AFSCC)

1. Revise as follows:

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height ~~is~~ shall be increased by ~~20~~ 10 feet (~~6096~~ 1524 mm), except that for Group B and H-4 occupancies in buildings of Type IIA or IV construction, the increase shall be 20 feet, and the maximum number of stories ~~is~~ shall be 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~~ shall be increased by ~~20~~ 10 feet (~~6096~~ 1524 mm) and the maximum number of stories ~~is~~ shall be increased by one, but shall not exceed ~~60 feet (18 288 mm) or~~ four stories~~, respectively~~.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

Reason: The purpose of this proposed code change is to reduce from 20 feet to 10 feet the 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. During a thorough review of the heights allowed by the International Building Code (IBC) in comparison to the three legacy codes, it was discovered that the 20 foot height increase for automatic sprinkler systems in the IBC allows 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 (UBC Type II – F.R. and SBC Type II) for which the UBC allowed the same height of 160 feet as the IBC 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 the comparable construction Type 2A.

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 comparable 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 column at the far right shows the maximum height that would be allowed by the IBC with the proposed automatic sprinkler system increase of 10 feet for an additional comparison. 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 exceed the maximum allowable height permitted in Table 503 of the IBC without the 20 foot height increase for automatic sprinklers.

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

IV	4	65’	B	85’	85’	75’
			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’	60’
			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’	50’
			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
*** with proposed 10 foot sprinkler increase

A review of the table clearly shows that in only eight 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. 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 information being provided during the ICC drafting process to justify this extra height increase. So it is 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.

We have compiled a second table which consolidates all of the outliers that would result if the 20 foot automatic sprinkler increase was reduced to 10 feet as proposed by this code change. These outliers are those occupancy groups and types of construction combinations that would exceed the total building height allowed by the IBC with the proposed 10 foot reduction in the height increase for automatic sprinklers as compared to the total building height allowed by the BOCA NBC. It is obvious that there is only a handful of outliers out of a possible 210 combinations.

Construction Type		**Height Limit (ft)**				**Maximum**
IBC	NBC	IBC*	NBC**		IBC***	**Stories******
IIA	2B	65’	B	85’	75’	6
			F-2	85’		6
			H-4	85’		6
			S-2	85’		6
IV	4	65’	B	85’	75’	6
			F-2	85’		6
			H-4	85’		6
			S-2	85’		6
VB	5B	40’	I-1	55’	50’	3
			R-1	55’		3
			R-2	55’		3
			R-3	55’		4

*without 20 foot sprinkler increase
**with 20 foot sprinkler increase
***with proposed 10 foot sprinkler increase
****with 1 story sprinkler increase

A further look at the table entries above can even eliminate some of them as not being practical for the application of the height limitations. For example, the F-2’s and S-2’s can basically be discounted since they are very rare to begin with and certainly are not generally built to six stories or 85 feet in height. The R-3 entry can also be discounted since it is only allowed to be three stories in height under the BOCA NBC although it is allowed to be 4 stories under the IBC.

Basically, for Types IIA and IV construction this leaves Group B and H-4 occupancies which are 10 feet less in height than would have been allowed by the BOCA NBC. At the proposed 75 foot height limit, the average floor-to-floor height would be 12 feet 6 inches. Allowing for 3 feet of floor or roof structure including the floor or roof and the supporting beams and girders, this would accommodate an average finished ceiling height of at least 9 feet 6 inches per story which is not unreasonable. However, to accommodate these occupancies, we have further modified the text to allow the full 20 foot height increase to be consistent with the BOCA NBC.

For Type VB construction which basically allows a maximum three stories in height, at the proposed 50 foot height limit the average floor-to-floor height would be 16 feet 8 inches. Again, this should be much more than adequate for the Group I-1, R-1, and R-2 occupancies which would be 5 feet less in height than allowed by the BOCA NBC.

With this proposed code change there should be no significant impact on the existing building stock in those jurisdictions that have previously adopted the BOCA National Building Code. Yet when the buildings are sprinklered, this amendment would still allow for greater building heights than those currently allowed by both the SBCCI Standard Building Code and the ICBO Uniform Building Code where previously adopted. Basically, this code change proposal will bring the International Building Code somewhat closer to what was previously allowed for building heights in feet by all three of the legacy model codes from which the IBC evolved.

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

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

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

G124–07/08
504.2, 506.3

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

1. Revise as follows:

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

Exceptions:

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

2. Revise as follows:

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

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

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

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

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

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

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

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

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

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

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

2 - The value afforded to fire sprinkler systems.

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

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

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

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

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

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

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

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

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

G125–07/08
504.2, 506.3

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise as follows:

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases ~~are~~ 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.

504.2.1 Height increase limitations~~. Exceptions:~~ The maximum height and maximum number of stories increases permitted in Section 504.2 shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.
4. 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.

506.3.1 Area increase limitations. ~~Exception:~~ The area limitation increases permitted in section 506.3 shall not be permitted for the following conditions:

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

	ICC IBC		BOCA NBC		ICBO UBC		SBCCI SBC	
	Area	Height	Area	Height	Area	Height	Area	Height
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.* 51,750 s.f.**	5 st. 75'	47,520 s.f.	4 st. 60'	48,000 s.f. or 24,000 s.f.	2 st. 55' 3 st. 55'	51,000 s.f.	5 st. 55'

As Revised by this Proposal

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

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. or 48,000 s.f.	2 st. 55' 3 st. 55'	204,000 s.f. or 255,000 s.f.	4 st. 55' 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.

"Double Dipping"

Type IIB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Area Only / Increase IBC	Height Only / Increase IBC
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 2 st.	49,875 3 st.
A-3	106,875 3 st.	83,160 3 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 2 st.	49,875 3 st.
B	258,750 5 st.	190,800 4 st.	48,000 3 st. 96,000 2 st.	255,000 5 st.	258,750 4 st.	120,750 5 st.
E	163,125 3 st.	142,560 3 st.	54,000 2 st. 81,000 1 st.	48,000 2 st. 48,000 1 st.	108,750 2 st.	76,125 3 st.
F-1	174,375 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	252,000 4 st.	116,250 2 st.	81,375 3 st.
I-1	112,500 4 st.	110,880 4 st.	NP NP	180,000 5 st.	112,500 3 st.	52,500 4 st.
I-2	52,250 1 st.	32,400 1 st.	NP NP	40,000 1 st.	52,250 1 st.	52,250 1 st.
M	140,625 5 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	135,000 5 st.	140,625 4 st.	65,625 5 st.
R-1/ R-2	180,000 5 st.	126,720 4 st.	36,400 3 st. 72,800 2 st.	180,000 5 st.	180,000 4 st.	84,000 5 st.
S-1	196,875 4 st.	83,160 3 st.	48,000 3 st. 96,000 2 st.	192,000 4 st.	196,875 3 st.	91,875 4 st.

"Double Dipping"

Type IIIB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Area Increase Only IBC	Height Increase Only IBC
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 2 st.	49,875 3 st.
A-3	106,875 3 st.	83,160 3 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 2 st.	49,875 3 st.
B	213,750 5 st.	190,080 4 st.	48,000 3 st. 96,000 2 st.	210,000 5 st.	213,750 4 st.	99,750 5 st.
E	163,125 3 st.	142,560 3 st.	54,000 2 st. 81,000 1 st.	48,000 2 st. 48,000 1 st.	108,750 2 st.	76,125 3 st.
F-1	135,000 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	180,000 4 st.	90,000 2 st.	63,000 3 st.
I-1	112,500 4 st.	110,880 4 st.	NP NP	180,000 5 st.	112,500 3 st.	52,500 4 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP NP	NP NP
M	140,625 5 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	135,000 5 st.	140,625 4 st.	65,625 5 st.
R-1/ R-2	180,000 5 st.	126,720 4 st.	36,400 3 st. 72,800 2 st.	180,000 5 st.	180,000 4 st.	84,000 5 st.
S-1	196,875 4 st.	83,160 3 st.	48,000 3 st. 96,000 2 st.	192,000 4 st.	196,875 3 st.	91,875 4 st.

"Double Dipping"

Type VB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Area Only Increase IBC	Height Only Increase IBC
A-2	45,000 2 st.	10,800 2 st.	24,000 2 st. 36,000 1 st.	20,000 2 st. 20,000 1 st.	28,500 1 st.	21,000 2 st.
A-3	45,000 2 st.	37,800 2 st.	24,000 2 st. 36,000 1 st.	20,000 3 st. 20,000 2 st.	28,500 1 st.	21,000 2 st.
B	101,250 3 st.	71,280 3 st.	32,000 3 st. 64,000 2 st.	54,000 3 st. 54,000 2 st.	67,500 2 st.	47,250 3 st.
E	71,250 2 st.	64,800 2 st.	36,400 2 st. 54,600 1 st.	32,000 2 st. 32,000 1 st.	45,125 1 st.	33,250 2 st.
F-1	63,750 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	40,000 2 st. 40,000 1 st.	40,375 1 st.	29,750 2 st.
I-1	50,625 3 st.	41,580 3 st.	NP NP	42,000 3 st. 42,000 2 st. 28,000 1 st.	33,750 2 st.	23,625 3 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP NP	NP NP
M	67,500 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	36,000 3 st. 36,000 2 st. 24,000 1 st.	42,750 1 st.	31,500 2 st.
R-1/	78,750	47,520	24,000	42,000	52,500	36,750

R-2	3 st.	3 st.	3 st. 48,000 2 st. 36,000 1 st.	3 st. 42,000 2 st. 28,000 1 st.	2 st.	3 st.
S-1	67,500 2 st.	37,800 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	24,000 2 st. 24,000 1 st.	42,750 1 st.	31,500 2 st.

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

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

G126–07/08
504.2, 506.3

Proponent: Ken Kraus, Los Angeles Fire Department, CA

Revise as follows:

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

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

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

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

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

Reason: The purpose of this code change is to reduce the reliance of firefighters and the community on sprinkler systems in areas of the country where the water supply may be interrupted by natural disaster or water system operation issues in the event of an emergency. Sections 504.2 and 506.3 are just two of many provisions found in the code where it is assumed in times of emergency the water supply will be available and reliable for fire suppression systems. In many parts of the country that assumption may not be an acceptable risk. In areas or regions where buildings may remain without reliable water supply after a natural disaster it is an unacceptable risk to firefighters and communities to increase **both** the height and allowable area based on the assumption the water supply will be operational. History has shown that fire after a disaster can be more destructive to life and property than the disaster itself.

A code change that is being heard by the Fire Safety committee will include the definition for areas of interrupted water supply as follows:

AREAS OF INTERRUPTED WATER SUPPLY. Regions or areas where the water supply available for fire suppression is subject to extended periods of failure due to natural disaster or other factors, as determined by the building official to meet any of the following conditions:

1. Areas, regions or geologic features where the 0.2 second spectral response acceleration in Figure 1613.5(1) is 150% or greater; or alluvial valleys located between or adjacent to geologic features or areas where the 0.2 second spectral response acceleration in Figure 1613.5(1) is 150% or greater.
2. Flood hazard areas defined in Section 1612.3.
3. Hurricane-prone regions defined in Section 1609.2.
4. Areas where the water system is not deemed to be operational or reliable in the event of an emergency as determined by the building official.

Cost Impact: This provision will increase the cost of construction in certain geographic areas or regions as defined.

Analysis: The committee is requested to state its intent regarding this code change proposal should the definition of "**AREAS OF INTERRUPTED WATER SUPPLY.** " given in the code change proposal for the IBC-Fire Safety committee be disapproved.

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

G127–07/08
504.2, 506.4.1

Proponent: Jason Thompson, PE, National Concrete Masonry Association NCMA, representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

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

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area per story (*Aa*), 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 (*Aa*), 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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.~~

Reason: The Masonry Alliance of Codes and Standards (MACS) has decided to submit this code change proposal in order to assure that the ICC Class A voting members have an opportunity to review and discuss during the ICC code development hearings to be held in February, 2008 in Palm Springs, CA. Basically, we are resubmitting Code Change G118-06/07 which was originally submitted by the California Fire Chiefs Association and the Tri-Chapters Code Committee for the previous code development cycle. However, it was not specifically heard at the ICC Code Development Committee Hearings held in September, 2007 in Lake Buena Vista, FL because of the decision by many interested parties including the California Fire Chiefs Association and the ICC Tri-Chapters Code Committee to participate in a Study Group to evaluate height and area requirements of the IBC based on the significant number of code change proposals that expressed concerns about how the height and area limits were established and determined. Since that Study Group did not produce any Public Comments for the ICC Final Action Hearings in Rochester, NY to address this issue, we thought it would be appropriate to make sure that it is on the agenda for this final code development cycle before the publication of the 2009 edition of the IBC. We have also used the same reason statement that was provided in that original code change proposal. We would also point out that an identical code change proposal was also submitted by the Building Officials Association of Florida (BOAF) Code Development Committee which was designated as G117-06/07. We have not included their reason statement since we think the following statement adequately covers their concerns as well.

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.

The Masonry Alliance for Codes and Standards (MACS) is in full support of this code change proposal and agrees with the original proponents supporting statement as well. We think the issues have been clearly stated and adequate reasons given to support this particular code change proposal. Therefore, we respectfully request the Committee approve this code change proposal as submitted for the reasons stated.

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

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

G128 –07/08
505.1

Proponent: Lori Lee Graham, City of Portland, OR

Revise as follows:

505.1 General. A mezzanine or mezzanines in compliance with Section 505 shall be considered a portion of the story ~~below~~ in which it is contained. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area defined in Section 702. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

Reason: In the 2003 IBC, this first sentence stated that a mezzanine was considered a "portion for the floor below". As part of a series of editorial code changes addressing the use of "level" or 'floor', this section was changed from floor to story. One can now read that a mezzanine on the 3rd story is considered a portion of the 2nd story, the story below. Mezzanines are part of the story defined by the ceiling above the mezzanine and the floor below the mezzanine platform.

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

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

G129–07/08
505.4

Proponent: William McErlane, City of Springdale, OH, representing the Ohio Building Officials Association

Revise as follows:

505.4 (Supp) Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In occupancies other than Groups H and I, ~~occupancies~~ that are no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

Reason: Existing text is awkward. It confuses the user by appearing to refer to " …Groups H and I occupancies which are no more than two stories in height…" The proposed text clarifies the intent.

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

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

G130–07/08
505.5

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

505.5 (Supp) Equipment platforms. Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area in accordance with Section 903. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs, alternating tread devices and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

Reason: The purpose of this proposed change to IBC-2006 is to allow the use of alternating tread devices as an access component to equipment platforms.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to equipment platforms that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 505.5 is overly restrictive in that it does not allow the use of alternating tread devices as an access component to equipment platforms, but does allow ladders for such use. (Or the intent of the section is to imply that other access components such as alternating tread devices are allowed but this is not clearly stated).

Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Alternating tread devices have been successfully used as an access component to equipment platforms for approximately 25 years. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and size rails) are typically safer to use than vertical ladders and are suitable for the application specified in section 502. IBC-2006 currently allows use of alternating tread devices for accesses such as to mezzanines, boiler incinerator and furnace rooms, refrigeration machinery rooms, gallery gridirons and catwalks, unoccupied roofs, etc. Also, access to equipment platforms is a primary intended use for alternating tread devices, especially since they can be used such that tools can be carried up or down the device.

Alternating tread devices were patented and 1981 and their use to equipment platforms has been allowed by the Occupational Safety and Health Administration (OSHA) since December of 1981. Alternating tread devices were allowed as an access component to equipment platforms per The BOCA National Building Code/1999 and the 1997 Uniform Building Code, which were precursor codes to IBC. Alternating tread devices are also allowed to be used as an access component to equipment platforms under NFPA-101, 2006.

Bibliography:
OHSA instruction STD 1-1.11, dated 4/26/82
Letter dated 12/2/81 from Mark Cowan (OHSA) to Dale Ordoyne (Lapeyre Stair)
Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32
The BOCA National Building Code/1999, section 2805.2.5
1997 Uniform Building Code, section 1003.3.3.1
Letter dated 10/20/87 from Tom Briggs (ICBO) to J. Robert Nelson (PFS Corp.)
NFPA-101, 2006, section 7.2.11.1 (3)
IBC-2006 sections 1009.1, 1015.3, 1015.4, 1015.6.1

Cost Impact: The code change proposal could minimally affect the cost of construction if alternating tread devices are used in lieu of ladders for access to equipment platforms.

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

G131–07/08
505.5.4 (New)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Add new text as follows:

505.5.4 Vertical rise. Alternating tread devices used to access equipment platforms shall not have a rise greater than 20 ft. (3658 mm) between floor levels or landings.

Reason: The purpose of this proposed change to IBC-2006 is to clarify the maximum allowable vertical height, without requiring an intermediate landing or platform, for alternating tread devices that are used to access equipment platforms.

The proposed change is superior to the current provisions of the code in that it rectifies shortcomings in the code by clarifying the maximum allowable vertical height, without the use of an intermediate landing or platform, for alternating tread devices that access equipment platforms.

Alternating tread devices used to access equipment platforms are for use by maintenance/industrial workers. Such workers are typically able to climb higher vertical distances than the general public without an intermediate landing. Sections 502 and 505 allow the use of a ladder to access equipment platforms. Allowable heights for ladders are not addressed in IBC. OHSA regulations in 29CFR1910.27 allow ladders with cages, wells or safety devices up to 30 feet in height before a landing is required; Ladders without cages, wells or safety devices are allowed up to 20 feet in height before a landing is required. IMC section 306.5 allows ladders up to 30 feet in height without a landing. Alternating tread devices are typically not equipped with cages, wells or safety devices; however they are typically safer than a ladder as they have a larger landing area for the users' feet, side rails that act as a guard and a handrail and a shallower angle. Additionally, alternating tread devices have been shown by approximately 25 years of successful use and by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Therefore, allowing alternating tread devices with vertical heights of 20 feet (the same vertical distance as ladders without cages, wells or safety devices) without requiring a landing is reasonable.

Bibliography:
IBC sections 502 and 505
IMC section 306.5
29CFR1910.27(d)(2) Fixed Ladders – Landing Platforms
Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32

Cost Impact: The code change proposal could minimally reduce the cost of construction in some cases by eliminating the need for landings for alternating tread devices.

Analysis: See code change proposal E68-07/08 that adds a similar requirement to Chapter 10 of the IBC.

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

G132–07/08
506.2.1

Proponent: John Berry, Cole + Russell Architects, Inc.

Revise as follows:

506.2.1 (Supp) Width limits. The value of *W* shall be at least 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of *W* is greater than or equal to 20 feet (6096 mm). Where the value of *W* exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. Where two or more buildings are on the same lot, *W* shall be measured from the exterior face of a building to the exterior face of an opposing building, as applicable.

Exception: The value of *W* divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.

Reason: I have recently experienced some confusion from building officials on two separate projects that interpreted the determination of "W" on a multi-building development on the same property was determined by placing an imaginary line between the two buildings as one would do for the determination of fire separation distance for Table 602 and per the definition of Fire Separation Distance in Section 702. Per ICC staff, "For the measurement of "W", the major concern is the amount of open area between buildings. Because the buildings are on the same lot, the owner is in control of the space between buildings. W can be measured between buildings on the same lot."

Approval of this proposal will clarify this issue for all users of the code.

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

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

G133–07/08
506.3

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise as follows:

506.3 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional ~~200~~ 100 percent (I_s = ~~2~~ 1) for buildings with more than one story above grade plane and an additional ~~300~~ 200 percent (I_s = ~~3~~ 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 Group H-1.
2. The automatic sprinkler system increase shall not apply to the building area of an occupancy in Group H-2 or H-3. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.3.3.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

Reason: We are submitting this code change proposal as a follow up to Code Change Proposal G120-06/07 which was submitted during the last code development cycle by the Building Officials Association of Florida (BOAF) Code Development Committee. However, that code change proposal was not heard during the initial Code Development Committee Hearings held in Lake Buena Vista, FL because it was included into a group of code change proposals to be studied by an Ad Hoc Working Group.

This code change proposal is submitted in the spirit of compromise to hopefully serve as a vehicle for reaching consensus on many of the concerns expressed about the excessive allowable heights and areas in the current International Building Code (IBC) as compared to those allowed by the previous legacy codes. To assist the Committee in making an analysis as to how this will impact the existing building stock, we have provided some tables which show comparisons of the impact on this code change proposal to various selected occupancies as it relates to the current IBC, the IBC as revised and the previous legacy model codes.

Automatic Sprinkler Increase

100% Reduction

Type IIB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Revised IBC 2 Stories	Revised IBC ≥ 3 Stories
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st.	48,000 3 st. 48,000 2 st.	52,250	78,375 3 st.
A-3	106,875 3 st.	83,160 3 st. 75,600 2 st.	36,400 2 st.	48,000 3 st. 48,000 2 st.	52,250	78,375 3 st.
B	258,750 5 st.	190,800 4 st. 129,600 2 st.	48,000 3 st. 96,000 2 st.	255,000 5 st. 102,000 2 st.	126,500	189,750 5 st.
E	163,125 3 st.	142,560 3 st. 129,600 2 st.	54,000 2 st.	48,000 2 st.	79,750	119,625 3 st.
F-1	174,375 3 st.	95,040 3 st. 86,400 2 st.	48,000 3 st. 96,000 2 st.	252,000 4 st. 126,000 2 st.	85,250	127,875 3 st.
I-1	112,500 4 st.	110,880 4 st. 75,600 2 st.	NP NP	180,000 5 st. 72,000 2 st.	55,000	82,500 4 st.
I-2	52,250 1 st.	32,400 1 st.	NP NP	40,000 1 st.	N/A	N/A
M	140,625 5 st.	95,040 3 st. 86,400 2 st.	48,000 3 st. 96,000 2 st.	135,000 5 st. 54,000 2 st.	68,750	103,125 5 st.
R-1/ R-2	180,000 5 st.	126,720 4 st. 86,400 2 st.	36,400 3 st. 72,800 2 st.	180,000 5 st. 72,000 2 st.	88,000	132,000 5 st.
S-1	196,875 4 st.	83,160 3 st. 75,600 2 st.	48,000 3 st. 96,000 2 st.	192,000 4 st. 96,000 2 st.	96,250	144,375 4 st.

Automatic Sprinkler Increase

100% Reduction

Type IIIB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Revised IBC 2 Stories	Revised IBC ≥ 3 Stories
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st.	48,000 3 st. 48,000 2 st.	52,250	78,375 3 st.
A-3	106,875 3 st.	83,160 3 st. 75,600 2 st.	36,400 2 st.	48,000 3 st. 48,000 2 st.	52,250	78,375 3 st.
B	213,750 5 st.	190,080 4 st. 129,600 2 st.	48,000 3 st. 96,000 2 st.	210,000 5 st. 84,000 2 st.	104,500	156,750 5 st.
E	163,125 3 st.	142,560 3 st. 129,600 2 st.	54,000 2 st.	48,000 2 st.	79,750	119,625 3 st.
F-1	135,000 3 st.	95,040 3 st. 86,400 2 st.	48,000 3 st. 96,000 2 st.	180,000 4 st. 90,000 2 st.	66,000	99,000 3 st.
I-1	112,500 4 st.	110,880 4 st. 75,600 2 st.	NP NP	180,000 5 st. 72,000 2 st.	55,000	82,500 4 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP	NP NP
M	140,625 5 st.	95,040 3 st. 86,400 2 st.	48,000 3 st. 96,000 2 st.	135,000 5 st. 54,000 2 st.	68,750	103,125 5 st.
R-1/ R-2	180,000 5 st.	126,720 4 st. 86,400 2 st.	36,400 3 st. 72,800 2 st.	180,000 5 st. 72,000 2 st.	88,000	132,000 5 st.
S-1	196,875 4 st.	83,160 3 st. 75,600 2 st.	48,000 3 st. 96,000 2 st.	192,000 4 st. 96,000 2 st.	96,250	144,375 4 st.

Automatic Sprinkler Increase

100% Reduction

Type VB Construction

8/20/2007

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	Revised IBC 2 Stories	Revised IBC ≥ 3 Stories
A-2	45,000 2 st.	10,800 2 st.	24,000 2 st.	20,000 2 st.	33,000	N/A 2 st.
A-3	45,000 2 st.	37,800 2 st.	24,000 2 st.	20,000 3 st. 20,000 2 st.	33,000	N/A 2 st.
B	101,250 3 st.	71,280 3 st. 64,800 2 st.	32,000 3 st. 64,000 2 st.	54,000 3 st. 54,000 2 st.	49,500	74,250 3 st.
E	71,250 2 st.	64,800 2 st.	36,400 2 st.	32,000 2 st.	52,250	N/A 2 st.
F-1	63,750 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st.	40,000 2 st.	46,750	N/A 2 st.
I-1	50,625 3 st.	41,580 3 st. 37,800 2 st.	NP NP	42,000 3 st. 42,000 2 st.	24,750	37,125 3 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP	NP NP
M	67,500 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st.	36,000 3 st. 36,000 2 st.	49,500	N/A 2 st.
R-1/ R-2	78,750 3 st.	47,520 3 st. 43,200 2 st.	24,000 3 st. 48,000 2 st.	42,000 3 st. 42,000 2 st.	38,500	57,750 3 st.
S-1	67,500 2 st.	37,800 2 st.	32,000 3 st. 64,000 2 st.	24,000 2 st.	49,500	N/A 2 st.

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

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

G134–07/08
506.3, 506.4.1

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

Revise as follows:

506.3 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent (I_s = 2) for buildings with more than one story ~~above grade plane~~ and an additional 300 percent (I_s = 3) for buildings with no more than one story ~~above grade plane~~. The number of stories shall be determined in accordance with Section 506.4.These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

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

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

506.4.1 (Supp) Area determination, more than one story. The total allowable building area of a building with more than one story ~~above grade plane~~ 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~~ as ~~listed~~ specified below~~:~~. The number of stories shall be determined in accordance with Section 506.4.

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. ~~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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.

Reason: The total allowable building area of a building with more than one story is determined by applying Section 506.4, which is based on the number of stories, including basements. The exception to Section 506.4 permits a single basement to be excluded from the determination. For buildings with more than one basement, however, all but one basement is required to be included in the determination. Thus, the number of stories, when applying the provisions of Section 506.4, equals the number of stories above grade plane plus the number of basements minus a single basement.

Section 506.3 specifies the procedure for determining the area increase factor due to sprinkler protection for buildings with one story and with more than one story. Section 506.4.1 specifies the procedure for determining the total allowable building area. The procedures applicable to buildings with more than one story, however, are limited to buildings with specified numbers of stories above grade plane. Thus, the determinations exclude the basements that are required to be included by Section 506.4. This proposal corrects the conflicts between these provisions.

Item #3 of Section 506.4.1 is relocated to a second paragraph because it specifies a requirement unrelated to the subject of Section 506.4.1, which is the determination of total allowable building area for a building with more than one story.

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

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

G135–07/08
506.4, 506.4.1, 506.4.1.1, 506.5 (New), 506.5.1 (New), 506.5.2 (New)

Proponent: Gene Boecker, Code Consultants, Inc. and Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

1. Revise as follows:

506.4 (Supp) Single occupancy buildings with more than one story. The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined in accordance with this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

Exception: A single basement 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.

506.4.1 (Supp) Area determination. The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined by multiplying the allowable area per story (*Aa*), 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 (*Aa*), 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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.

2. Delete as follows:

~~**506.4.1.1 (Supp) Mixed occupancies.** In buildings with mixed occupancies, the allowable area per story (*Aa*) 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.~~

3. Add new text as follows:

506.5 Mixed occupancy area determination. The total allowable building area for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single basement 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.

506.5.1 No more than one story above grade plane. For buildings with no more than one story above grade plane and containing mixed occupancies, the total building area shall be determined in accordance with the applicable provisions of Section 508.1.

506.5.2 More than one story above grade plane. For buildings with more than one story above grade plane and containing mixed occupancies, each story shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed three.

Reason: Mixed occupancy area determination procedures were first introduced into the 2006 IBC. Section 506.4.1.1 intends to prescribe multistory mixed occupancy provisions that were formerly not addressed in the IBC. Unfortunately, it tends to oversimplify what is necessarily a complicated process based on the recognition of numerous multistory, mixed occupancy design options. We submitted a modification to former Section 506.4.1 in Orlando that was approved as modified by the General Code Development Committee. That action was overturned by the membership in Rochester based on a public comment that the proposal was too wordy.

This simplified proposal integrates mixed occupancy provisions into the single occupancy, multistory requirements as revised by the 2007 Supplement. The key feature of this proposal is that it acknowledges all three of the mixed occupancy design options (accessory occupancies, nonseparated occupancies and separated occupancies) and maintains the rational sum of the ratio concept contained in the current provision. For one story, mixed occupancy buildings, proposed Section 506.5.1 defaults to Section 508.1 which prescribes allowable area determination procedures for each mixed occupancy contingency. For multistory buildings, Section 506.5.2 of the proposal still defaults to Section 508.1 which limits the allowable area of a given story based on the applicable design method. The current provision limits two-story buildings to an aggregate sum of the ratios of two and three for three or higher story buildings. This in fact is a moot point because if Section 508.1 individual story requirements are followed, the required ratios will never be exceeded.

For example, in a nonsprinklered, two-story, Type IIA building with 3,000 sf of Group B occupancy and 23,000 sf of Group S-1 occupancy on the first story and 2,000 sf of Group M and 24,000 sf of Group B occupancy on the second story, two mixed occupancy design options come into play. The first story qualifies for the nonseparated occupancy design method because the total square footage is equal to that permitted for the most restrictive, Group S-1 occupancy (26,000 sf). The second floor is larger that that permitted for a Group M occupancy; however, inasmuch as the Group M occupancy is less than 10% of the area of the second story, it qualifies as an accessory occupancy if subsidiary to the Group B occupancy. In this instance, each story individually qualifies based on the applicable mixed occupancy provision and therefore would always meet the current requirement that the sums of the ratios shall not exceed 2.0 in a two-story building. (26,000 ÷ 26,000) + (26,000 ÷ 37,500) = 1.69 > 2.0 ϕ OK. Obviously, if a third story were added the sum of the ratio calculation would be no more than 2.69 and satisfy the current 3.0 aggregate sum of the ratio requirement for a three-story building.

The aggregate sum of the ratio not to exceed three requirement does become appropriate for buildings of four or more stories in height. In the previous example, with only 0.31 credit remaining for a fourth story, it would appear that the building footprint would have to be reduced or the area of the fourth story reduced so as not to exceed the 3.0 maximum for buildings of more than three stories in height. For example: a nonsprinklered, four story, Type IIA building with 3,000 sf of Group B occupancy and 17,000 sf of Group S-1 occupancy on the first story, 2,000 sf of Group M and 18,000 sf of Group B occupancy on the second story, 6,667 sf of Group B occupancy, 6,667 sf of Group M occupancy and 6,667 sf of Group F-1 occupancy on the third story and 2,000 sf of Group S-2 occupancy and 18,000 sf of Group S-1 occupancy on the fourth story. Story One: nonseparated occupancies -- 20,000 ÷ 26,000 = 0.77. Story Two: accessory occupancies -- 20,000 ÷ 37,500 = 0.53. Story Three: nonseparated occupancies -- 20,000 ÷ 21,500 = 0.93. Story Four: accessory occupancies --20,000 ÷ 26,000 = 0.77. Aggregate sum of the ratios: 0.77 + 0.53 + 0.93 + 0.77 = 3.0 ≥ 3.0 ϕ OK.

Similar to single occupancy, multistory buildings, these mixed occupancy, multistory provisions only apply to buildings not permitted to be of unlimited area. Unlike Section 506.4.1, it was felt that an exception referencing Section 507 was inappropriate as there is no Section 507 unlimited area provision would apply to a building four or more stories in height.

In summary, this proposal provides comprehensive requirements for the relatively common mixed occupancy, multistory design condition. Approval of this proposal will clarify current requirements and provide specific, but simple, guidance for the determination of total allowable building areas in multistory, mixed occupancy buildings that is currently lacking 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

G136–07/08
506.4

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

Revise as follows:

506.4 (Supp) 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 this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

Exceptions:

1. In buildings of Type IIB, IIIB or VB construction, a single basement ~~need~~ shall not be required to 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.
2. In buildings of Type I, IIA, IIIA, IV or VA construction, the basements shall not be required to be included in the total allowable building area provided each basement does not exceed the area permitted for a building with no more than one story above grade plane.

Reason: The Exception to Section 506.4 (2007 Supplement, Section 506.1.1 in 2006 IBC) exempts a single basement from being included in the total allowable building area. Proposal G8-06/07-AMPCI revised the definition of "basement" to being a "story that is not a story above grade plane." Thus, each vertical space "between the upper surface of a floor and the upper surface of the floor next above" (from the definition of "story") is a basement and a "single basement" is the bottommost story in a building, which is typically between the bottommost basement floor and the basement floor next above. The purpose of this proposal is to (1) limit the exemption for a single basement to Types IIB, IIIB and VB construction, and (2) create a second exception for Types I, IIA, IIIA, IV and VA construction that would expand the exemption to all basements (i.e., all stories that are not stories above grade plane).

Three diagrams accompany this proposal. The first diagram ("Basements Included in Total Allowable Building Area") illustrates the locations of the stories and basements, which are described below by means of an example. It also specifies which basements would be included in the total allowable building area if the proposal is approved. The second diagram ("Maximum Building Area, Single Occupancy, Types IIB, IIIB and VB Construction") and third diagram ("Maximum Building Area, Single Occupancy, Types I, IIA, IIIA, IV and VA Construction") illustrate how the

determination of the maximum area of a building with more than one story above grade plane would be affected by the proposal. In each diagram, the top row of illustrations applies to buildings with one story below grade plane (i.e., one basement) and the bottom row of illustrations applies to buildings with two stories below grade plane (i.e., two basements).

Imagine a building that is eight stories in height. Grade plane is located at the upper surface of the floor at Story #5, which also places it at the upper surface of the floor above Story #4. Thus, there are four stories above grade plane (Stories #5 through #8) and four stories below grade plane (Stories #1 through #4). Stories #1 through #4 are completely below grade plane, which means that they are also basements.

The Exception to Section 506.4 exempts Story #1 from the total allowable building area. The building would still have four stories above grade plane but the uppermost seven stories would be included in the determination of total allowable building area. If all stories below the first story above grade plane (i.e., all basements) were exempted, the building would have four stories above grade plane but the uppermost four (not seven) stories would be included in the determination of total allowable building area. In the determination of total allowable building area, the proposed changes would result in the uppermost seven stories being included for Types IIB, IIIB and VB construction, and the uppermost four stories being included for Types I, IIA, IIIA, IV and VA construction.

The building code places limitations on building area, building height and number of stories principally because (1) a building's occupants need to escape during an emergency, (2) fire fighters and other emergency responders need to rescue occupants who are unable to escape and suppress the cause of the emergency (i.e., building fires), and (3) the fuel load in the building affects the ability of occupants to escape from, and emergency responders to respond to, emergencies such as building fires.

Considering the first two conditions, occupants typically escape from a building at grade (i.e., level of exit discharge). Emergency responders typically approach a building for rescue and fire fighting purposes at grade. The larger the building area, the higher the building height or the greater the number of stories, the more difficult it is for occupants to escape and emergency responders to perform rescue and fire fighting operations.

Based on the first two conditions, the limitations on building area, building height and number of stories should be determined from grade because the consequences to occupants and emergency responders are largely due to their quantities as measured from grade. An exception to this, however, is the fuel load in a building, which increases with the number of stories above the foundation rather than above grade.

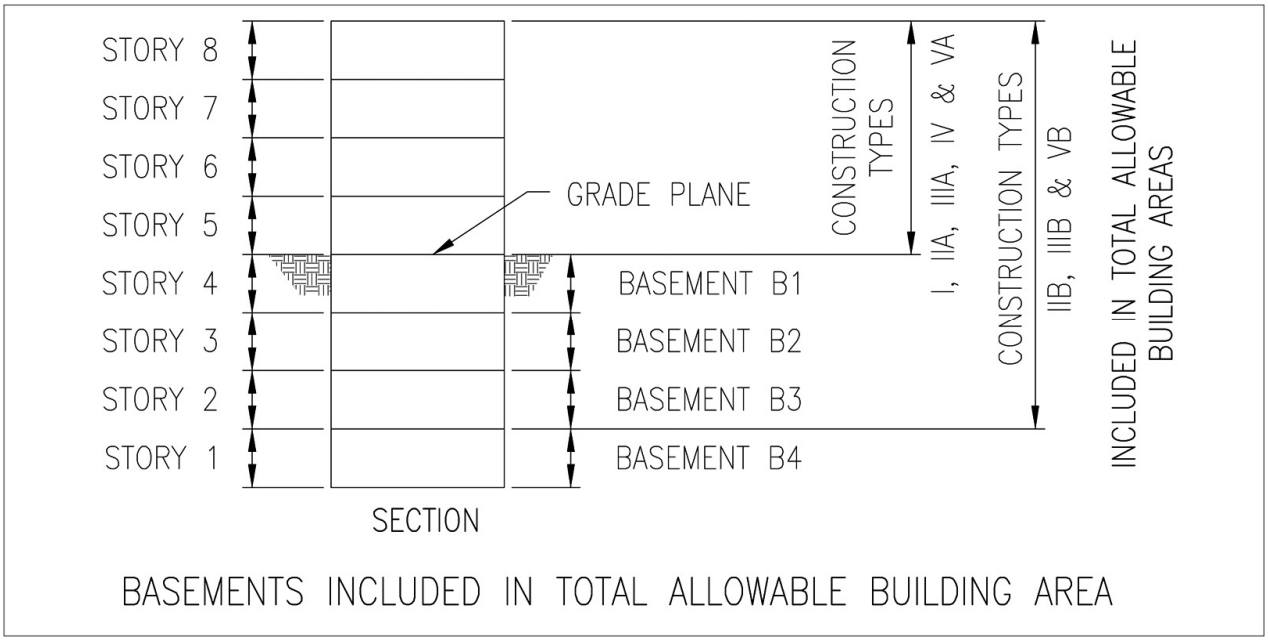
Multistory buildings are typically constructed with fire-resistance-rated horizontal assemblies supported by fire-resistance-rated structural frames (e.g., columns, beams, bearing walls, etc.), which typically form separate fire areas at each story. This occurs at buildings of Type I, IIA, IIIA, IV or VA construction. The fuel load of an individual story rather than the entire building typically impacts egress and emergency response and is affected by the location of the story above or below grade. There are also other mitigating factors affecting the impact of fire load, notably automatic sprinkler systems, which are typically required at stories below grade due to a lack of fire access openings and other factors.

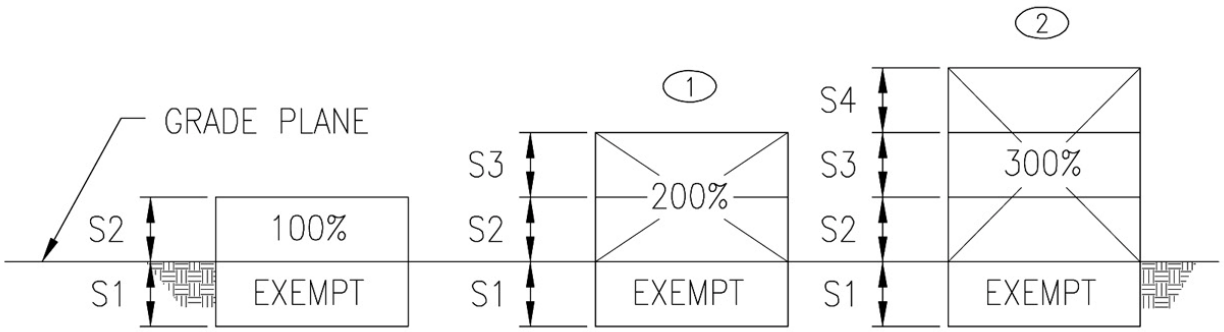
Multistory buildings, however, are not always of Type I, IIA, IIIA, IV or VA construction. A building of Type IIB, IIIB or VB construction is typically nonrated except for specific areas separated or enclosed by fire containment assemblies (e.g., horizontal exits, shaft enclosures, exit enclosures, etc.). There is typically a single fire area in the building extending from the foundation to the roof, encompassing all areas of the building not otherwise separated or enclosed. The fuel load affecting occupants and emergency responders is not necessarily limited to a single story but can potentially extend to all areas of the building. The installation of an automatic sprinkler system at the stories below grade is an effective method of fire protection but it lacks redundancy. There are no means of limiting the fire area to a single story as there are for a building of Type I, IIA, IIIA, IV or VA construction.

Because of the reasons given above, exempting a single basement in the determination of total allowable building area is judged to be warranted for buildings of Type IIB, IIIB and VB construction but is judged to not be warranted for buildings of Type I, IIA, IIIA, IV and VA construction. The purpose of this proposal is to revise Section 506.4 consistent with these judgments.

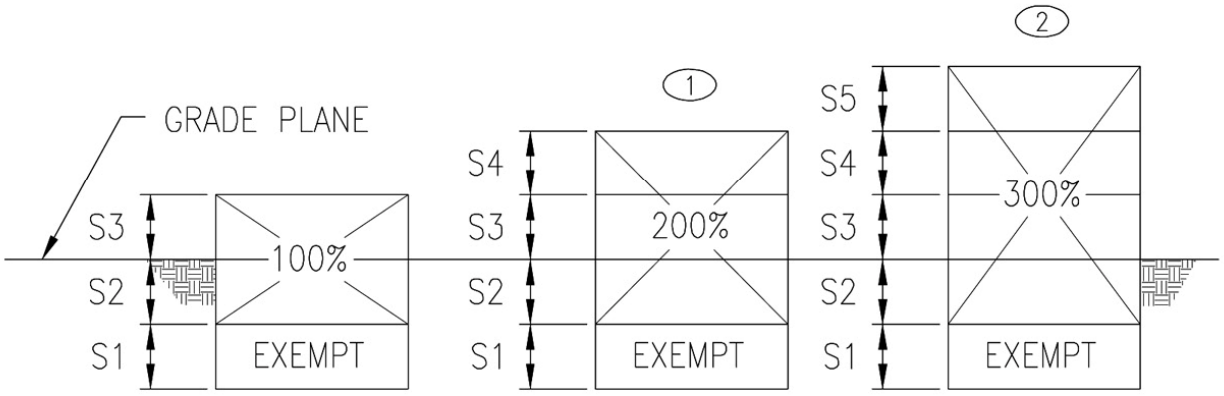
The change from "need not be" to "shall not be required to be" in proposed Exception #1 is made to eliminate nonmandatory language.

It has been suggested that the current Exception to Section 506.4 is derived from a report by the CABO Board for the Coordination of the Model Codes (BCMC) on building heights and areas, dated February 9, 1988. It is correct that the current language in the Exception to Section 506.4 is similar to Section 4.1.2 of the BCMC report but the recommendations in the report were not fully adopted by any of the model code organizations whose provisions on building areas and heights also differed substantially. Note that the recommendations in the report were published 20 years ago. There has been substantial development in building code provisions for building heights and areas since then.





SECTION

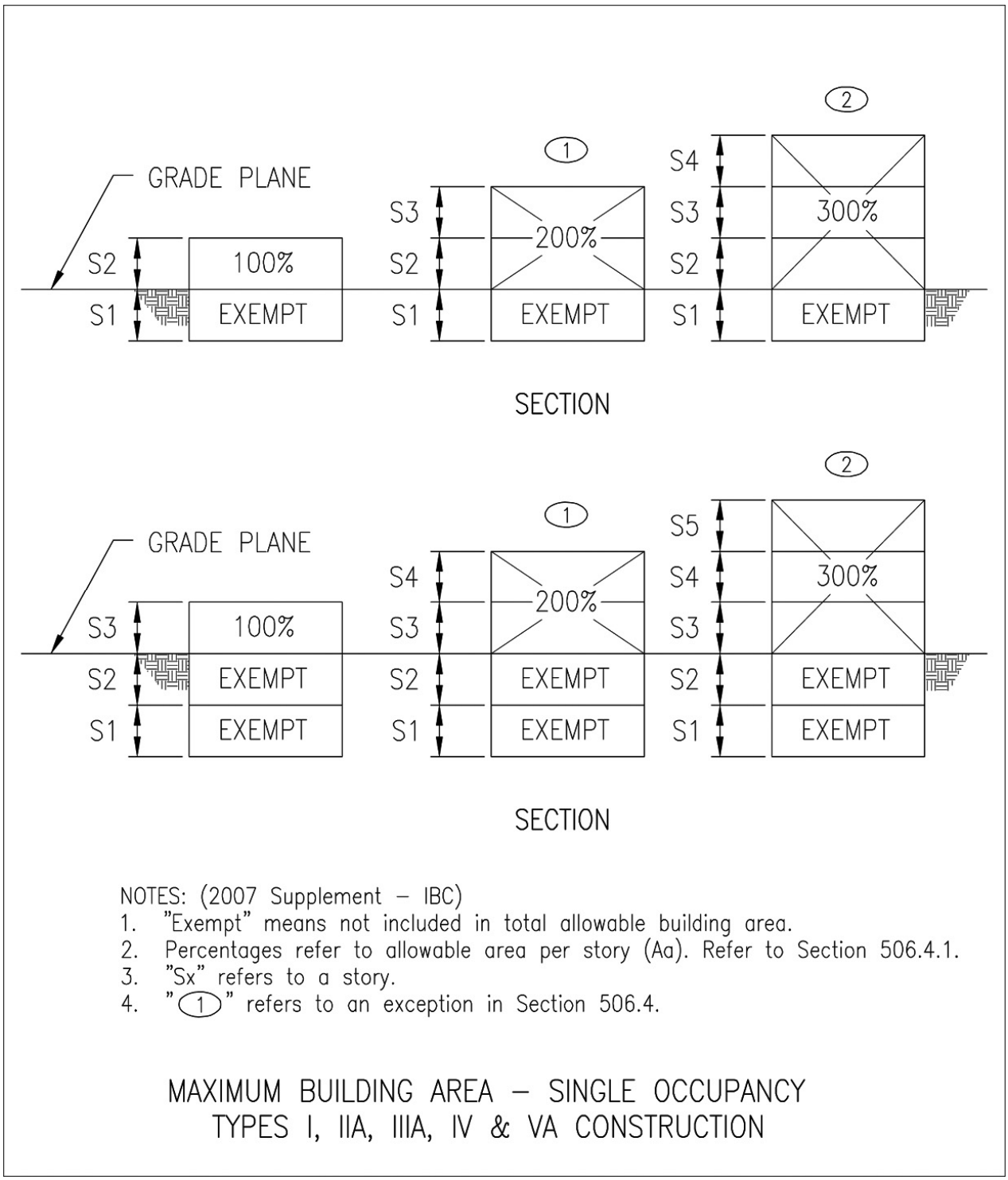


SECTION

NOTES: (2007 Supplement – IBC)

1. "Exempt" means not included in total allowable building area.
2. Percentages refer to allowable area per story (Aa). Refer to Section 506.4.1.
3. "Sx" refers to a story.
4. "(1)" refers to an exception in Section 506.4.

MAXIMUM BUILDING AREA – SINGLE OCCUPANCY TYPES IIB, IIIB & VB CONSTRUCTION



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

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

G137–07/08
506.4.1

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

Revise as follows:

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area per 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 (*Aa*), 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 *(Aa)*, as determined in Section 506.1, by the number of stories above grade plane.~~

Reason: **Dean:** 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 Aa (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 IBCi. 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.

Kraus: The intention of this code change proposal is to reduce the total building area for buildings with 3 or more stories above grade.

There are many ways to adjust the height and area allowances of the IBC. I have chosen this particular section and mechanism because it was not a primary mechanism of any of the legacy groups to calculate total building area for buildings 3 stories and taller. Eliminating the 3X multiplier significantly reduces the area of these buildings, bringing the IBC closer to alignment with areas allowed previously (although, generally they will still be larger).

The following text is substantially similar to the supporting information for proposed changes to 504.2 and 506.4.

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

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

During previous code hearings and at various committee meetings this sentiment was offered to console individuals that, after calculating height and area values under the IBC, found the IBC allowed buildings to be constructed taller and much larger (by a factor of 2 to 3) than any legacy code or BCMC recommendations. This reality came to the forefront after the Orlando code development hearing and caused, presumably and in part, the CTC BFP Work Group to rethink height and area. Once the Work Group identified some 50 “anomalies”, concern grew when the science used to formalize Table 503 values could not be harnessed to the point that rendered confidence.

Add to this, the fact that each legacy group had somewhat different height and area enhancements, (increased allowances or multipliers for location on property, type of construction, multiple stories etc). While these factors seemed to stand the test of time regionally, the additive combining of these elements and their influence on the suspect tabular values brings into question the efficacy of IBC Chapter 5 which allows buildings to be constructed both taller and larger that any legacy code.

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

2 - The value afforded to fire sprinkler systems.

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

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

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

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

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

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

I urge the Committee to consider this proposal as a reasonable method of bringing the IBC area allowances more in line with those found in the basis documents. The disparity between the 3 story IBC areas and the legacy codes is too great to accept without additional mitigating protectives.

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

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

G138–07/08
506.4.1, 506.4.1.1

Proponent: Jason Thompson, PE, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards (MACS)

Revises as follows:

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area per story (*Aa*), 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.~~

506.4.1.1 (Supp) 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: The Masonry Alliance of Codes and Standards (MACS) has decided to submit this code change proposal in order to assure that the ICC Class A voting members have an opportunity to review and discuss during the ICC code development hearings to be held in February, 2008 in Palm Springs, CA. Basically, we are resubmitting Code Change G121-06/07 which was originally submitted by the California Fire Chiefs Association and the Tri-Chapters Code Committee for the previous code development cycle. However, it was not specifically heard at the ICC Code Development Committee Hearings held in September, 2007 in Lake Buena Vista, FL because of the decision by many interested parties including the California

Fire Chiefs Association and the ICC Tri-Chapters Code Committee to participate in a Study Group to evaluate height and area requirements of the IBC based on the significant number of code change proposals that expressed concerns about how the height and area limits were established and determined. Since that Study Group did not produce any Public Comments for the ICC Final Action Hearings in Rochester, NY to address this issue, we thought it would be appropriate to make sure that it is on the agenda for this final code development cycle before the publication of the 2009 edition of the IBC. We have also used the same reason statement that was provided in that original code change proposal. We would also point out that an identical code change proposal was also submitted by the Building Officials Association of Florida (BOAF) Code Development Committee which was designated as G123-06/07, the National Association of State Fire Marshals (NASFM) submitted code change proposal G122/06/07, and the California State Fire Marshal (CSFM) submitted code change proposal G116-06/07. We have not included their reason statement since we think the following statement adequately covers their concerns as well.

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 will increase the cost of construction.

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

G139–07/08
506.4.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise as follows:

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area per story (*Aa*), 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 <u>of other than Types IIB, IIIB, and VB construction</u> with three or more stories above grade plane, multiply by 3; and

3. No story shall exceed the allowable area per story (*Aa*), 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 <u>of other than Type IIB, IIIB, or VB construction</u> 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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.

Reason: The purpose of this code change is to reduce the total allowable building area from three times to two times that allowed 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 legacy 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 ICBO UBC, and is similar to the approach that was used in the BOCA NBC.

However, this proposed code change limits the 2x multiplier for multistory buildings to those buildings of the non-fire-resistance rated types of construction which include Types IIB, IIIB, and VB construction. This represents a compromise between previous code change submittals that were made by the Building Officials Association of Florida (BOAF) Code Development Committee (G123-06/07), the California Fire Chiefs Association/Tri-chapters Code Committee (G121-06/07) and the National Association of State Fire Marshals (NASFM) (G122-06/07). These code change proposals were not actually discussed during the ICC Code Development Committee Hearings held in Lake Buena Vista, FL for the beginning of the last cycle due to the fact that they were incorporated into an effort to study these issues and come out with a consensus on how to deal with the concerns expressed about the excessive allowable heights and areas in the current International Building Code (IBC). What we are attempting to do with this code change proposal is to provide a vehicle for reaching consensus on this issue by compromising with the limitation of the 3x multiplier not being applicable to multistory buildings of the non-fire-resistance rated types of construction. Obviously, those types of construction are the greatest concern since they have no built in passive fire-resistive protection to protect the structure from early collapse during an uncontrolled fire condition.

We have also put together some tables comparing the allowable heights and areas of the current IBC to the IBC as it would be modified if this code change proposal were approved, as well as to the three legacy model codes to the show the maximum allowable areas permitted by those codes. This should help the Committee to understand the overall impact of this code change on the existing building stock throughout the country.

Multi-Story Multiplier

3x vs. 2x

Type IIB Construction

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	3 x Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	2 x Revised IBC
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 3 st.
A-3	106,875 3 st.	83,160 3 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 3 st.
B	258,750 4 st.	190,800 4 st.	48,000 3 st. 96,000 2 st.	255,000 5 st.	172,500 4 st.
E	163,125 3 st.	142,560 3 st.	54,000 2 st. 81,000 1 st.	48,000 2 st. 48,000 1 st.	108,750 3 st.
F-1	174,375 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	252,000 4 st.	116,250 3 st.
I-1	112,500 4 st.	110,880 4 st.	NP NP	180,000 5 st.	75,000 4 st.
I-2	52,250 1 st.	32,400 1 st.	NP NP	40,000 1 st.	52,250 1 st.
M	140,625 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	135,000 5 st.	93,750 3 st.
R-1/ R-2	180,000 4 st.	126,720 4 st.	36,400 3 st. 72,800 2 st.	180,000 5 st.	120,000 4 st.
S-1	196,875 3 st.	83,160 3 st.	48,000 3 st. 96,000 2 st.	192,000 4 st.	131,250 3 st.

Multi-Story Multiplier

3x vs. 2x

Type IIIB Construction

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	3 x Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	2 x Revised IBC
A-2	106,875 3 st.	21,600 2 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 3 st.
A-3	106,875 3 st.	83,160 3 st.	36,400 2 st. 54,600 1 st.	48,000 3 st. 48,000 2 st.	71,250 3 st.
B	213,750 4 st.	190,080 4 st.	48,000 3 st. 96,000 2 st.	210,000 5 st.	142,500 4 st.
E	163,125 3 st.	142,560 3 st.	54,000 2 st. 81,000 1 st.	48,000 2 st. 48,000 1 st.	108,750 3 st.
F-1	135,000 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	180,000 4 st.	90,000 3 st.
I-1	112,500 4 st.	110,880 4 st.	NP NP	180,000 5 st.	75,000 4 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP NP
M	140,625 3 st.	95,040 3 st.	48,000 3 st. 96,000 2 st.	135,000 5 st.	93,750 3 st.
R-1/ R-2	180,000 4 st.	126,720 4 st.	36,400 3 st. 72,800 2 st.	180,000 5 st.	120,000 4 st.
S-1	196,875 3 st.	83,160 3 st.	48,000 3 st. 96,000 2 st.	192,000 4 st.	131,250 3 st.

Multi-Story Multiplier

3x vs. 2x

Type VB Construction

Maximum Allowable Total Building Area (sf)

Maximum Allowable Building Height (stories)

Occ.	3 x Current IBC	BOCA NBC	ICBO UBC	SBCCI SBC	2 x Revised IBC
A-2	45,000 2 st.	10,800 2 st.	24,000 2 st. 36,000 1 st.	20,000 2 st. 20,000 1 st.	45,000 2 st.
A-3	45,000 2 st.	37,800 2 st.	24,000 2 st. 36,000 1 st.	20,000 3 st. 20,000 2 st.	45,000 2 st.
B	101,250 3 st.	71,280 3 st.	32,000 3 st. 64,000 2 st.	54,000 3 st. 54,000 2 st.	67,500 3 st.
E	71,250 2 st.	64,800 2 st.	36,400 2 st. 54,600 1 st.	32,000 2 st. 32,000 1 st.	71,250 2 st.
F-1	63,750 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	40,000 2 st. 40,000 1 st.	63,750 2 st.
I-1	50,625 3 st.	41,580 3 st.	NP NP	42,000 3 st. 42,000 2 st. 28,000 1 st.	33,750 3 st.
I-2	NP NP	NP NP	NP NP	NP NP	NP NP
M	67,500 2 st.	43,200 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	36,000 3 st. 36,000 2 st. 24,000 1 st.	67,500 2 st.
R-1/ R-2	78,750 3 st.	47,520 3 st.	24,000 3 st. 48,000	42,000 3 st. 42,000	52,500 3 st.

			2 st. 36,000 1 st.	2 st. 28,000 1 st.	
S-1	67,500 2 st.	37,800 2 st.	32,000 3 st. 64,000 2 st. 48,000 1 st.	24,000 2 st. 24,000 1 st.	67,500 2 st.

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

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

G140–07/08
506.4.1.1, 506.4.1, 506.4.2 (New), 508.4.2

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

1. Revise as follows:

~~506.4.1.1~~ 506.1.1 (Supp) ~~Mixed~~ Nonseparated and separated occupancies. ~~In buildings with mixed occupancies~~ The allowable building area per story shall be determined in accordance with the following:

1. Where all of the occupancies are nonseparated occupancies in accordance with Section 508.3, the allowable building 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. ~~When~~ Where all of the occupancies are ~~treated according to Section 508.3.3 as~~ separated occupancies in accordance with Section 508.4, 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~~ allowable building area per story (A_a) shall be determined in accordance with Section 508.4.2.
3. Where the occupancies are a combination of nonseparated and separated occupancies in accordance with Sections 508.3 and 508.4, respectively, the allowable building area per story (A_a) shall be such that the sum of the ratios of the actual building areas of the separated occupancies, which the nonseparated occupancies are portions thereof, divided by the corresponding allowable building areas of the separated occupancies shall not exceed one at each story.

506.4.1 (Supp) Building area determination, no separated occupancies. The total allowable building area of a building with more than one story above grade plane and without separated occupancies in accordance with Section 508 shall be determined by multiplying the allowable area per story (*Aa*), as determined in Section 506.1, by the number of stories above grade plane as follows:

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 (*Aa*), 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 *(Aa),* as determined in Section 506.1, by the number of stories above grade plane.

2. Add new text as follows:

506.4.2 Building area determination, separated occupancies. The total allowable building area of a building with more than one story and with separated occupancies shall be determined in accordance with items 1 and 2 of this section. The number of stories shall be determined in accordance with Section 506.4.

1. Where all of the occupancies are separated occupancies in accordance with Section 508.4, the total allowable building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy, at all stories included in the total allowable building area, shall not exceed 2 for buildings with two stories and 3 for buildings with three or more stories.
2. Where the occupancies are a combination of nonseparated and separated occupancies in accordance with Sections 508.3 and 508.4, respectively, the total allowable building area shall be such that the sum of the ratios of the actual building areas of the separated occupancies, which the nonseparated occupancies are portions thereof, divided by the corresponding allowable building areas of the separated occupancies, at all stories included in the total allowable building area, shall not exceed 2 for buildings with two stories and 3 for buildings with three or more stories.

3. Revise as follows:

508.4.2 (Supp) Allowable area. In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the corresponding allowable building area of each separated occupancy shall not exceed one.

Reason: The purpose of this proposal is to establish technically sound provisions for the determination of allowable building area per story and total allowable building area for buildings with more than one separated occupancy. It will also align Section 506.4.1.1 (2007 Supplement, Section 506.4.1 in 2006 IBC, Sections 506.1.1 in proposal) with the provisions of Section 508 for nonseparated and separated occupancies. Section 506.4.1.1 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 building 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 506.4.1 (2007 Supplement, Section 506.4 in 2006 IBC), which limits the allowable building area per story (A_a) at each story.

The procedures in Section 506.4.1.1 apply to determining (1) the allowable building area per story, and (2) the total allowable building area, for a building with more than one separated occupancy. Section 506.1, however, applies to determining the allowable building area per story. Section 506.4 applies to determining the total allowable building area. The proposal relocates Section 506.4.1.1 to Section 506.1.1 and limits the procedures to allowable building area per story. Section 506.4.1 is revised to apply to total allowable building area in a building without separated occupancies. Proposed Section 506.4.2 contains the procedures for total allowable building area in a building with separated occupancies.

Because of the complexity involved in specifying the requirements for each case, they are proposed as separate items in the sections described above. 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 that is not necessarily applicable to the specific design conditions in Section 506.4.1.1. The method of determination in Section 508.4.2 (2007 Supplement, Section 508.3.3.2 in 2006 IBC), however, is directly applicable to consideration of individual stories and is referenced in Item #2 of Section 506.4.1.1 (Section 506.1.1 in proposal). It is not directly applicable to consideration of multiple stories and is not referenced, which is the case in Items #1 and #2 of proposed Section 506.4.2.

In conjunction with the proposed changes, Section 508.4.2 is revised by changing the "allowable" area of each separated occupancy to the "corresponding allowable" area of each separated occupancy and allowable "area" to allowable "building area." The first revision is being made because the current language does not rigorously connect the actual building area of each separated occupancy to the allowable building area of that particular separated occupancy.

The following is a summary of the items and their provisions:

Section 506.4.1.1, allowable building area per story: (2007 Supplement, Section 506.4.1 in 2006 IBC, Sections 506.1.1 in proposal)

1. All nonseparated occupancies, each story individually considered (multistory condition taken into account): apply most restrictive provisions for each occupancy by referencing Section 508.3.2.
2. All separated occupancies, each story individually considered: apply unity equation to each story by referencing Section 508.4.2, maximum 1.0.
3. Combination of nonseparated and separated occupancies, each story individually considered: apply unity equation to each story, maximum 1.0.

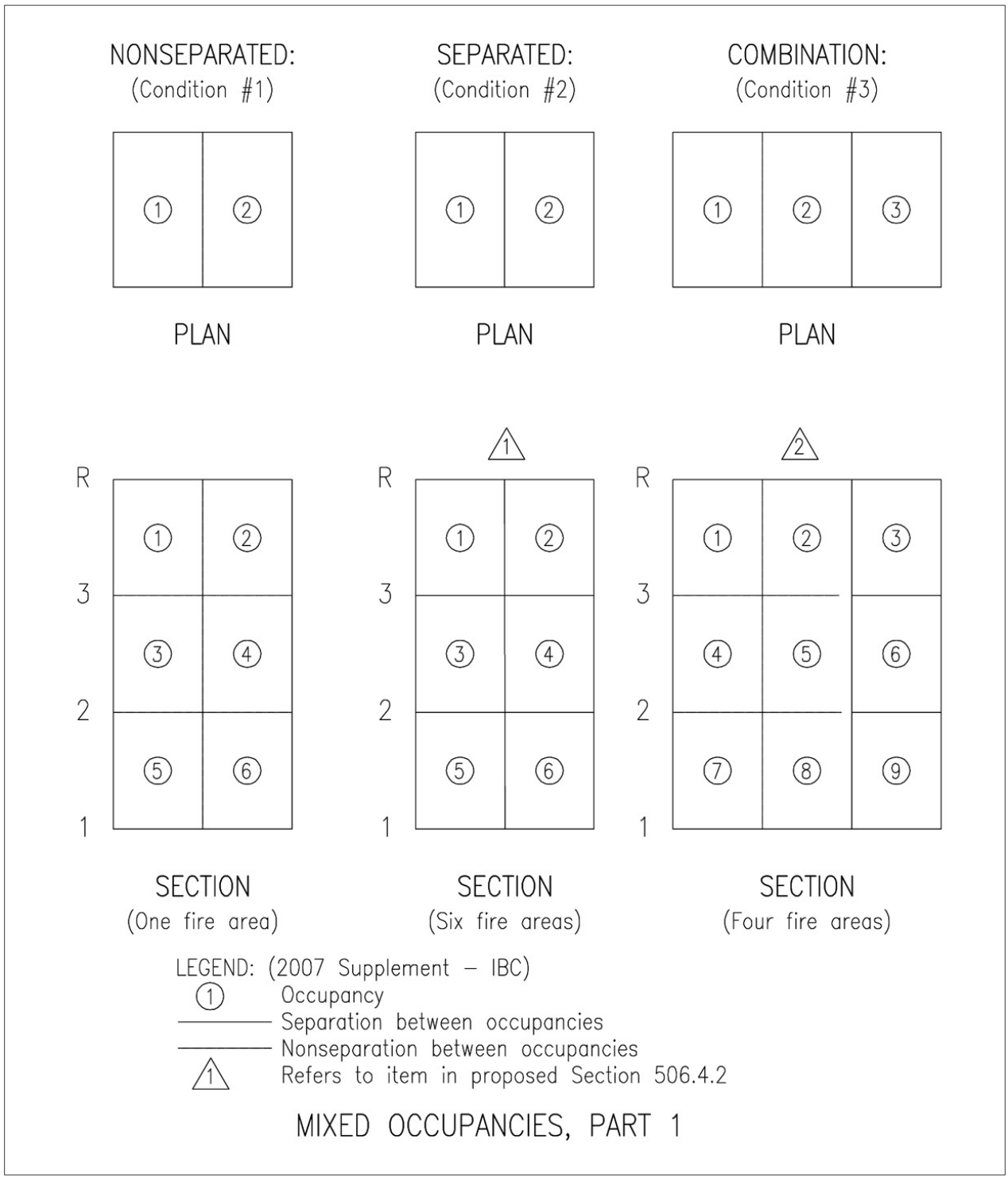
Proposed Section 506.4.2, total allowable building area:

1. All separated occupancies, multistory condition: apply unity equation to all stories included in total allowable building area, maximum 2.0 (2 stories), maximum 3.0 (3 or more stories).
2. 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), maximum 3.0 (3 or more stories).

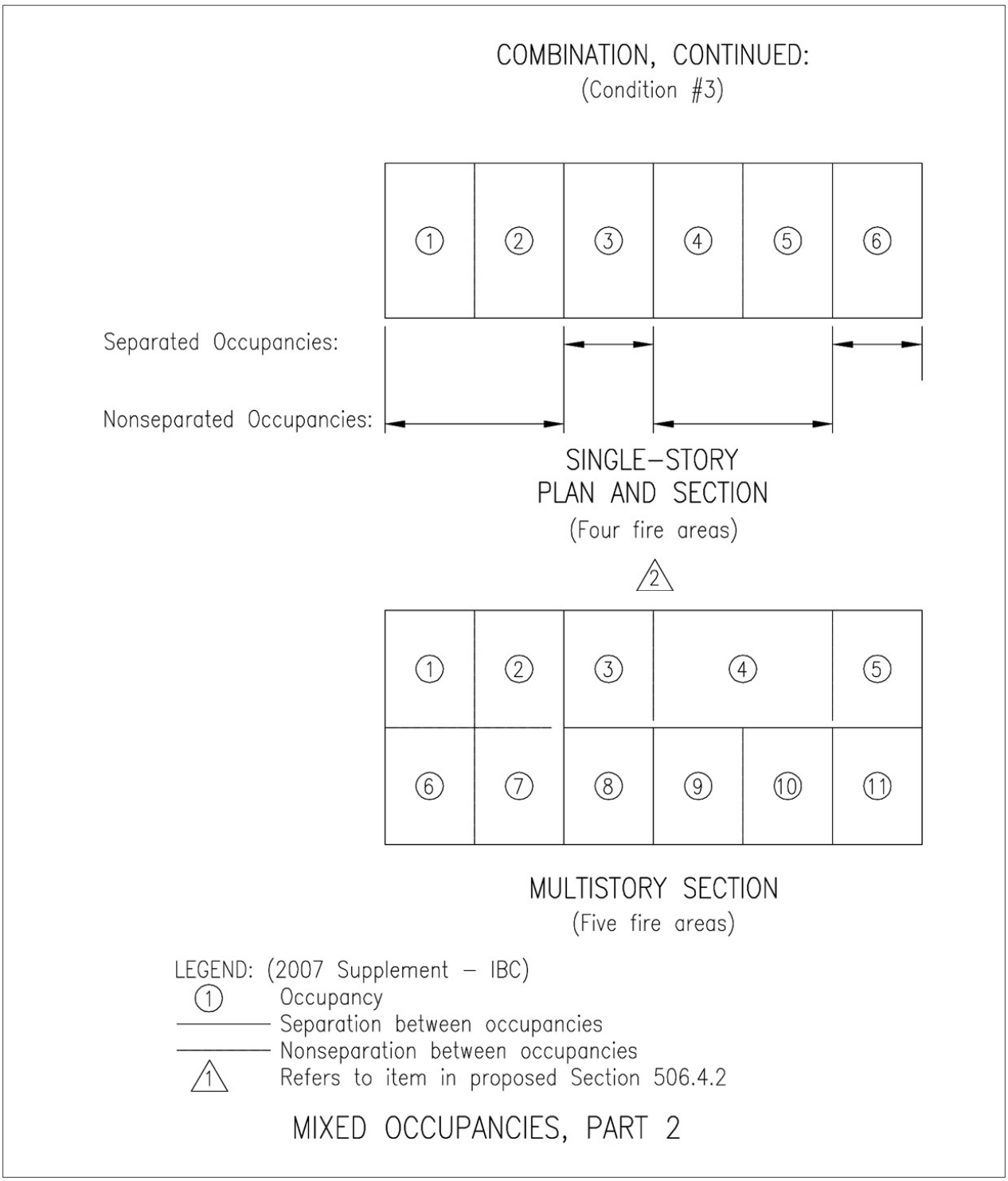
Two diagrams accompany this proposal. The first diagram ("Mixed Occupancies, Part 1") in the top row of illustrations depicts the basic conditions for a building consisting of all nonseparated occupancies (condition #1), all separated occupancies (condition #2), and a combination of nonseparated and separated occupancies (condition #3). The bottom row of illustrations depict, for each condition above, the corresponding item in proposed Section 506.4.2. The second diagram ("Mixed Occupancies, Part 2") illustrates additional combinations of nonseparated and separated occupancies.

Note that there is no reference in the bottom row of illustrations in the first diagram to an item in Section 506.4.2 for the condition of all nonseparated occupancies. The requirements for multiple stories and multiple separated occupancies are moot for this condition. Section 506.4.1 (2007 Supplement, Section 506.4 in 2006 IBC) on multiple stories and no separated occupancies accounts for this condition.

A related proposal addresses the conflict between Section 506.3, Section 506.4.1 and the Exception to Section 506.4 with respect to the number of basements exempt from the determination of total allowable building area.. A second related proposal addresses the use of "area" in Chapter 5 when "building area" is intended.



MIXED OCCUPANCIES, PART 1



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

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

G141–07/08
507.3, 504.1

Proponent: Thomas Kinsman, T. A. Kinsman Consulting Company, representing himself

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

~~1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.~~

~~2~~ 1. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-~~4~~, provided that:
   ~~2.1.~~ 1.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
   ~~2.2.~~ 1.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.

~~3.~~ 2. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
   ~~3.1.~~ 2.1. All assembly occupancies are separated from other spaces as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
   ~~3.2.~~ 2.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
   ~~3.3.~~ 2.3 All required exits shall discharge directly to the exterior.

504.1 General. The height permitted by Table 503 shall be increased in accordance with this section.

Exceptions:

1. The height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.
2. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Section 507.2 ~~and~~, 903.3.1.1 and Chapter 23 of the *International Fire Code*. ~~NFPA 230~~.

Reason: This proposal relocates Exception 1 in Section 507.3 to Section 504. There is no intending technical change to this proposal. The current provision is about an exception to the basic height provisions of the code for a very specific set of conditions, but it is currently found in Section 507 which is all about unlimited floor area. Section 504 addresses the basic Table 503 height provisions and general exceptions to those general provisions; as a result this is the best location for the subject exception.

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

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

G142–07/08
507.3

Proponent: Dave Ansell, Spotsylvania County Building Inspections, representing the Virginia Building and Code Officials Association

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections ~~507.2~~ 507.3 ~~and~~, 903.3.1.1 and Chapter 23 of the IFC. ~~NFPA 230~~.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
   2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
   2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
   3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
   3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
   3.3. All required exits shall discharge directly to the exterior.

Reason: This change is considered editorial and corrects an erroneous reference to 507.2. This language was contained in the BOCA legacy code and provides a height exception for unlimited area rack storage facilities. These rack storage facilities were allowed to contain combustible storage and be classified as an S-1 or F-1. As currently written the facility would be limited to F-2 or S-2 occupancies.

Additionally this change revises the reference to NFPA 230 to Chapter 23 of the IFC. This is related to the fact that NFPA 230 will no longer be published by NFPA and the type of information contained in NFPA 230 is essentially what is found in Chapter 23 of the IFC dealing with high-piled storage.

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

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

G143–07/08
507.3

Proponent: Dave Ansell, Spotsylvania County Building Inspections, VA, representing the Virginia Building and Code Officials Association

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.

2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
   2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
   2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
   3.1. All assembly occupancies are separated from ~~other spaces~~ adjacent occupancies by 2-hour fire barriers constructed in accordance with Section 706; ~~as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;~~
   3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
   3.3. All required exits shall discharge directly to the exterior.

Reason: Exception #3 allows A-1 and A-2 occupancies in unlimited area buildings provided they are separated from other occupancies in accordance with Table 508.3.3.4. We feel this exception has a large omission as presently written. This language was developed in the 05/06 cycle as a design tool for large strip malls with or without attached anchor stores or theaters. This language also allows for restaurants, bars, etc. within the unlimited area building without the 10% accessory limitation. Due to a change in Table 508.3.3.4 which removed hourly rating between like occupancies, an unlimited area building can now contain all A-2 uses without any hourly separations. We feel this was never the intent of this section. In real world applications, restaurants and bars located in strip malls typically have a high turnover. Many times hood suppression and fire sprinkler systems are not revised to accommodate new appliances and partitions. Equally concerning is the fact that business owners located in strip malls do not have access to fire control valves and gauges for required interval inspections.

This proposal removes the reference and dependency to Table 508.3.3.4 and simply states a 2-hour fire separation which is currently in line with the table for non-sprinkled occupancies and requires a 2-hour fire separation between A-1 and A-2 occupancies.

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

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

G144–07/08
507.3

Proponent: Dave Collins, AIA, The Preview Group, Inc., representing the AIA Codes Committee

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
   2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
   2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.

507.3.1 Mixed occupancy buildings with Group A-1 and A-2. ~~3.~~ Group A-1 and A-2 occupancies ~~of other than Type V construction~~ shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.3, provided:

~~3.1. All assembly~~ 1. Group A-1 and A-2 occupancies are separated from other ~~spaces~~ occupancies as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;

~~3.2. Each Group A occupancy~~ 2. The area of the portions of the building used for Group A-1 or Group A-2 occupancies shall not exceed the maximum allowable area permitted for such occupancies in Section 503.1; and

~~3.3~~. 3. All ~~required exits~~ exit doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.

Reason: **Exception #3 was** added to Section 507.3 for the 2006 IBC by Code Change No. G124-04/05. The intent of the change was to allow A1 and A2 occupancies in one story buildings of unlimited area, but not as stand alone buildings. Part of the rationale for the change was that such occupancies are allowed in the mix of uses in a covered mall building. The intent of this proposal is to clarify the intent of the original proposal as approved by the membership. This proposal moves the section from being an exception to 507.3 to being a related subsection 507.3.1. The reason for this organizational change is because the charging sentences of 507.3 never mention the A-1 and A-2 occupancies, and it is hard for the code user to understand that the exception adds occupancies. The first sentence of the new 507.3.1 is revised to make sure that such buildings comply with all the provisions of 507.3, not just that it can't be in a Type V building. Item 1 (former item 3.1) is revised so that it only applies to the A-1 and A-2 occupancies that this provision is intended to address rather than applying also to an A-4 occupancy which might be in a mixed occupancy building. Item 2 (former item 3.2) is revised similarly to Item 1 so that it is limiting the area of the A-1 and A-2 and not the A-4. Item 3 (former Item 3.3) is revised to clarify that it is the exit doors from the A-1 and A-2 occupancies and not all the exit doors throughout the building.

Cost Impact: This is simply editorial and has no cost impact.

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

G145–07/08
507.3

Proponent: Jason Thompson, PE, National Concrete Masonry Association NCMA, representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
   2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
   2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies <u>in buildings</u> of other than Type V construction shall be permitted, provided:
   3.1. ~~All assembly occupancies are separated from other spaces as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;~~
   <u>Each Group A-1 and A-2 occupancy shall be separated from each other and from all other spaces in the building by fire barriers having a fire-resistance rating of not less than 2-hours constructed in accordance with Section 706;</u>
   3.2. <u>The area of</u> each Group A<u>-1 and A-2</u> occupancy shall not exceed the maximum allowable area permitted in Section 503.1; ~~and~~
   <u>3.3 The aggregate area of the Group A-1 and A-2 occupancies shall not exceed 50 percent of the area of the building; and</u>
~~3.3~~ <u>3.4</u> All required exits shall discharge directly to the exterior.

Reason: This code change proposal is a follow up to our Code Change Proposal G128-06/07 which was disapproved as further revised by our Public Comment during the ICC Final Action Hearings held last May in Rochester, NY. That Code Change Proposal was one of a series of several code change proposals attempting to address the issue of how to allow certain types of Group A occupancies in one-story unlimited area buildings which began with Code Change G124-04/05. This Code Change Proposal has been revised to address the issues raised during the Rochester hearings.

A maximum area limit needs to be specified for the Group A occupancies being allowed by this Exception. Without putting such limits on the total area allowances for the Group A assembly occupancies, it is conceivable that the entire unlimited area building could be occupied by these Group A-1 and A-2 assembly occupancies. In our opinion, if it is desirable to have very large, in essence, unlimited area buildings containing Group A-1 and A-2 occupancies, then the building should be constructed as Type IB construction which permits unlimited areas for these occupancy groups.

We have proposed a maximum aggregate area for all the Group A-1/A-2 assembly occupancies permitted by this exception of 50% of the total area of the building. With the 50% limit, the building would still be classified as the primary occupancy specified in the charging paragraph of the section (i.e. Group B, F, M or S occupancy). Then with the Group A occupancies would, in essence, be considered accessory occupancies. If this issue was not dealing with an unlimited area building, then it would not be necessary to specify a maximum percent of aggregate area for the Group A assembly occupancies since the nonseparated occupancies option would determine how the allowable building height and area were to be calculated based on the percentage areas of each of the occupancies in the building compared to the maximum allowable area for each of those occupancies. But with an unlimited area building, the ratio of the actual area of the occupancy to the allowable area of the occupancy cannot be determined since, in essence, one would divide by infinity which represents the unlimited area allowed. However, under the separated occupancies option for mixed occupancy buildings, each occupancy is appropriately separated by fire barriers and the calculations are made as noted.

But in the nonseparated occupancies option the code specifies that the allowable height and area shall be determined based on that of the most restrictive occupancy in the building. But that doesn't work for an unlimited area building under the special provisions of this section. Under the case where the Group A occupancies would be treated as an accessory occupancy, the code would limit the aggregate area of the accessory occupancies to a maximum of 10% of the area of the story in which they are located and would further limit them to the tabular values in Table 503 without area increases in accordance with Section 506 for such accessory occupancies. What we have under this Exception 3 is a unique condition in which the Group A-1 and A-2 occupancies are allowed as part of the unlimited area building but they are not being treated as accessory occupancies and they are not being treated as the major occupancy for the building. Thus, there is a need to provide a clear limitation on the aggregate area to represent a compromise between the two extremes. We believe the 50% limit makes sense and is appropriate.

This code change also makes it clear that even the individual Group A-1 and A-2 occupancies located in the building would also need to be separated from each other if they were adjacent to one another. This would have been a requirement had not Table 508.3.3 Required Separation of Occupancies been significantly revised during the ICC Final Action Hearings in Detroit, MI based on Code Change Proposal G32-04/05. That table was previously designated as Table 302.3.2 Required Separation of Occupancies in the 2003 International Building Code (IBC) upon which the original Code Change Proposal G124-04/05 that introduced this Exception 3 was based. It would have required a minimum 2-hour fire-resistance rating between a Group A-1 and Group A-2 occupancy. Furthermore, Table 706.3.9 (previously Table 706.3.7) Fire-Resistance Rating Requirements for Fire Barrier Assemblies between Fire Areas requires Group A occupancies subdivided into fire areas of the same occupancy classification to also be separated by 2-hour fire-resistance rated construction. So that is why we put in the requirement in 3.1 that each Group A occupancy be separated from adjacent Group A occupancies by fire barriers having a minimum fire-resistance rating of 2-hours.

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

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

G146–07/08
507.5

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

Revise as follows:

507.5 Reduced open space. The ~~permanent open space~~ public ways or yards of 60 feet (18 288 mm) in width required in Sections 507.2, 507.3, 507.4, 507.6 and 507.10 shall be permitted to be reduced to not less than 40 feet (12 192 mm)~~,~~ in width provided the following requirements are met:

1. The reduced ~~open space~~ width shall not be allowed for more than 75 percent of the perimeter of the building.
2. The exterior walls facing the reduced ~~open space~~ width shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior walls facing the reduced ~~open space~~ width shall have opening protectives with a minimum fire protection rating of 3 hours.

Reason: The changes are proposed for consistency with the code sections referenced in Section 507.5 none of which specify permanent open space but all specify public ways or yards.

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

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