

3. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
4. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.2.1 Area limitations. Ancillary use areas when measured aggregately, 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 Table 503, without area increases in accordance with Section 506 for the occupancy of the ancillary use or uses.

~~**508.2.1 Occupancy classification.** An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located or the building shall be classified as a mixed occupancy and shall comply with Section 508.3.~~

508.2.2 Occupancy classification. Ancillary use areas shall be individually classified in accordance with Section 302.1.

508.2.3 Applicability of other code requirements. Code requirements shall apply to each portion of the building based on the occupancy classification of that ancillary use area, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.2.4 Allowable area and height. The allowable area 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 any ancillary use areas shall not exceed the tabular values in Table 503, without height increases in accordance with Section 504 for such ancillary occupancies. The area of the ancillary use area shall be in accordance with Section 508.2.1

508.2.5 Separation of occupancies. Except where required by Section 508.2.6 the walls or floors separating ancillary use areas from other occupancies shall not be required to be fire-resistance rated.

Exception: Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

~~**508.2.2 508.2.6 Separation of ancillary use areas.** Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2. The ancillary use areas listed in Table 508.2.6 shall be physically separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table 508.2.~~

~~**508.2.6.1 Fire resistance rated separation. 508.2.2.1 Construction.** Where Table 508.2 requires a fire-resistance-rated separation, the incidental ancillary use area 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.~~

~~**508.2.6.2 Nonfire-resistance rated separation and protection.** Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental ancillary use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions walls shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.3.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.~~

TABLE 508.2 INCIDENTAL ANCILLARY USE AREAS

(No changes to current text)

~~**508.2.3 508.2.6.3 Protection.** Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2, only the incidental use areas need be equipped with such a system.~~

~~**508.3 Mixed occupancies.** 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 Sections 508.3.1, 508.3.2, 508.3.3 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 or H-3 occupancies shall be located in a separate and detached building or structure.~~

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. 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 Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.3.1.1 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.3.1.2 Allowable area and height. The allowable area 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 any accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

508.3.1.3 Separation. No separation is required between accessory occupancies or the main occupancy.

Exception: Group H 2, H 3, H 4 or H 5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

(Renumber subsequent sections)

Reason: There has always been confusion when it comes to determining when a building has mixed occupancies, and if it does what level of protection and/or separation is required, and how "accessory use areas" and "incidental use areas" are related.

The changes made to Section 302 last cycle made it clear that both accessory use areas and incidental use areas are subsets of a mixed occupancy building, but that really was a beginning of what is needed to make Section 302 "user friendly.". This proposal seeks to go to the next level and

- Organize Section 302.3 to be more user-friendly, and
- Make it clear that "incidental use areas" are really only "accessory use areas" that require special protection.

To begin with, the use of two terms to define different aspects (or levels) of the same concept have been the source of confusion. Therefore, to make this cleaner and hopefully add clarity to the entire concept of mixed occupancies, it is proposed that both the term "accessory use area" and "incidental use area" be replaced with a new term - "ancillary use area." Then the provisions that were attached to each of these organized such that those provisions previously called "incidental use area" are now considered as "ancillary use area" but have special protection and/or separation provisions.

In addition, the text has been arranged such that when a building contains small areas occupied by an occupancy(s) that is different than that of the main occupancy, depending upon the risk of that "ancillary" occupancy it may or may not need to be separated from the main occupancy.

The proposed change is intended to clearly establish the hierarchy of the options available to a designer when a building contains mixed occupancies.

As the designer is fundamentally given the choice of which option they wish to apply when designing a building having mixed occupancies, the proposed code change arranges the code provisions in the order in which most designers are going to look at a mixed occupancy scenario. The order would be:

- 1) identify all of the occupancies in the building (regardless of the amount of area they occupy),
- 2) see if the area occupied by any one occupancy or multiple occupancies,
 - a) occupies < 10% of the aggregate floor area, or
 - b) exceeds the tabular values for either height or area for such occupancy.
- 3) if the occupancy(s) does occupy < 10% of the aggregate floor area nor exceed the tabular values for either height or area for such occupancy. or so, then it is an "ancillary use area" and Section 508.2 applies. If an "ancillary use area," it becomes clear that there are certain cases where it must be separated/protected - Table 508.2
- 4) If > 10% then it is not an "ancillary use area" and must comply with either a non separated occupancy or a separated occupancy.

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

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

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing North American Insulation Manufacturers' Association and the International Firestop Council

Delete and substitute as follows:

SECTION 508 MIXED USE AND OCCUPANCY

508.1 General. Where a building or portion thereof contains two or more occupancies or uses, the building or portion thereof shall comply with the applicable provisions of this section.

508.2 Incidental uses. Incidental use areas shall comply with the provisions of this section.

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

508.2.1 Occupancy classification. An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located or the building shall be classified as a mixed occupancy and shall comply with Section 508.3.

508.2.2 Separation. Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2.

508.2.2.1 Construction. Where Table 508.2 requires a fire resistance rated separation, the incidental use area 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. Where Table 508.2 permits an automatic fire extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire resistance rated floor/ceiling assembly or fire resistance rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self or automatic closing upon detection of smoke. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

508.2.3 Protection. Where an automatic fire extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2, only the incidental use areas need be equipped with such a system.

508.3 Mixed occupancies. 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 Sections 508.3.1, 508.3.2, 508.3.3 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 or H-3 occupancies shall be located in a separate and detached building or structure.

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. 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 Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.3.1.1 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of

that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

~~**508.3.1.2 Allowable area and height.** The allowable area 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 any accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.~~

~~**508.3.1.3 Separation.** No separation is required between accessory occupancies or the main occupancy.~~

~~**Exception:** Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.~~

~~**508.3.2 Nonseparated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall qualify as nonseparated occupancies.~~

~~**508.3.2.1 Occupancy classification.** Nonseparated occupancies shall be individually classified in accordance with Section 302.1. Code requirements 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 entire building or portion thereof.~~

~~**508.3.2.2 Allowable area and height.** The allowable 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.~~

~~**508.3.2.3 Separation.** No separation is required between occupancies.~~

~~**Exception:** Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.~~

~~**508.3.3 Separated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall qualify as separated occupancies.~~

~~**508.3.3.1 Occupancy classification.** Separated occupancies shall be individually classified in accordance with Section 302.1. Each fire area shall comply with this code based on the occupancy classification of that portion of the building.~~

~~**508.3.3.2 Allowable area.** In each story, the building area shall be such that the sum of the ratios of the actual floor area of each occupancy divided by the allowable area of each occupancy shall not exceed one.~~

~~**508.3.3.3 Allowable height.** Each occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1. The height, in both feet and stories, of each fire area shall be measured from grade plane. This measurement shall include the height, in both feet and stories, of intervening fire areas.~~

~~**Exception:** Special provisions permitted by Section 509.~~

~~**508.3.3.4 Separation.** Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.3.3~~

~~**508.3.3.4.1 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 508 **MIXED USE AND OCCUPANCY**

508.1 General. Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed below. Structures with multiple uses shall be classified according to Section 508.3. Where a structure is proposed for a purpose which is not specifically provided for in this code, such structure shall be classified in the group which the occupancy most nearly resembles, according to the fire safety and relative hazard involved.

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5
2. Business (see Section 304): Group B
3. Educational (see Section 305): Group E

4. Factory and Industrial (see Section 306): Groups F-1 and F-2
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4
7. Mercantile (see Section 309): Group M
8. Residential (see Section 310): Groups R-1, R-2, R-3 as applicable in Section 101.2, and R-4
9. Storage (see Section 311): Groups S-1 and S-2
10. Utility and Miscellaneous (see Section 312): Group U

508.1.1 Incidental use areas. Spaces which are incidental to the main occupancy shall be separated or protected, or both, in accordance with Table 508.1.1 or the building shall be classified as a mixed occupancy and comply with Section 508.3.2. Areas that are incidental to the main occupancy shall be classified in accordance with the main occupancy of the portion of the building in which the incidental use area is located.

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

508.1.1.1 Separation. Where Table 508.1.1 requires a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building with a fire barrier. Where Table 508.1.1 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly 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-closing or automatic-closing upon detection of smoke in accordance with Section 715.3.7.3. 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 Accessory use areas. A fire barrier shall be required to separate accessory use areas classified as Group H in accordance with Section 508.3.2 and incidental use areas in accordance with Section 508.1.1.1. Any other accessory use area shall not be required to be separated by a fire barrier provided the accessory use area occupies an area not more than 10 percent of the area of the story in which it is located and does not exceed the tabular values in Table 503 for the allowable height or area for such use.

508.2.1 Assembly areas. Accessory assembly areas are not considered separate occupancies if the floor area is equal to or less than 750 square feet (69.7 m²). Assembly areas that are accessory to Group E are not considered separate occupancies. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.3 Mixed occupancies. Where a building is occupied by two or more uses not included in the same occupancy classification, the building or portion thereof shall comply with Section 508.3.1 or 508.3.2 or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Areas of Group H-2, H-3, H-4 or H-5 occupancies shall be separated from any other occupancy in accordance with Section 302.3.2.
3. Where required by Table 415.3.2, areas of Group H-1, H-2 or H-3 occupancy shall be located in a separate and detached building or structure.
4. Accessory use areas in accordance with Section 508.2.
5. Incidental use areas in accordance with Section 508.1.1.

508.3.1 Nonseparated uses. Each portion of the building shall be individually classified as to use. The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building. All other code requirements shall apply to each portion of the building based on the use of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to these nonseparated uses. Fire separations are not required between uses, except as required by other provisions.

508.3.2 Separated uses. Each portion of the building shall be individually classified as to use and shall be completely separated from adjacent areas by fire barriers having a fire-resistance rating determined in accordance with Table 508.3.2 for uses being separated. Each fire area shall comply with this code based on the use of that space. Each fire area shall comply with the height limitations based on the use of that space and the type of construction classification. In each story, the building area shall be such that the sum of the ratios of the floor area of each use divided by the allowable area for each use shall not exceed one.

Exception: Except for Group H and I-2 areas, where the building is equipped throughout with an automatic sprinkler system, installed in accordance with Section 903.3.1.1, the fire-resistance ratings in Table 508.3.2 shall be reduced by 1 hour but to not less than 1 hour and to not less than that required for floor construction according to the type of construction.

508.4 Spaces used for different purposes. A room or space that is intended to be occupied at different times for different purposes shall comply with all the requirements that are applicable to each of the purposes for which the room or space will be occupied.

2. Renumber tables as follows:

TABLE 508-2 508.1.1 INCIDENTAL USE AREAS

TABLE 508-3-3 508.3.2 REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Reason: North American Insulation Manufacturers' Association.

To restore the separated uses (occupancies) concept previously prescribed in Section 302 of the 2003 IBC (and 2003 Supp) and clarify the distinction between separated uses and the non-separated use options.

During the last cycle the separated uses section of the IBC was changed based on public proposal G32-04/05 on the basis that it presented no significant technical changes. To the contrary, there are dozens of reductions in fire resistance ratings resulting from these changes, without justification or supporting rationale. This creates a potentially dangerous condition for certain building occupants and firefighters.

The occupancy separation Table has existed in the BOCA National Building Code for a very long time, and was incorporated into the first edition of the IBC. The concept of separation of major occupancies exists in Building regulations throughout the world. There continues to be a critical need to separate adjacent occupancies of dissimilar use, with fire-resistance rated construction.

As currently published, the 2006 Code provisions in Section 508 blur the distinction between separated uses and the non-separated use options previously prescribed in Section 302.3.1. In some cases, the reductions in required fire resistance ratings are as large as 3 hours for given occupancy separations, while in others, the requirement to provide fire separations is removed altogether. In the published "Report of the Public Hearing on the 2003 editions of the International Building Code", the committee's published reason for recommending adoption of G32-04/05 is reported as follows: "The proposal does not have any significant technical changes from the current requirements." In reality, this code change proposals has lead to literally dozens of separate and distinct reductions in fire resistance rating requirements, in both sprinklered and unsprinklered occupancies, without justification or compensation of any kind.

To illustrate an example, this change has unilaterally reduced the fire separation between a mixed use office and a moderate hazard warehouse from the previously existing 3-hour minimum fire separation to zero, while providing no technical justification or compensating measures. Table 302.3.2 of the 2003 IBC, as well as the Exception to Section 302.2.3 (IBC 2003 Supplement), specified a minimum fire resistance for every occupancy separation and did not permit a fire resistance rating to be less than one hour, even when an automatic sprinkler system was provided. In contrast, the new Table 302.3.2 allows numerous instances where the fire resistance ratings are waived entirely. Further, while Exception 1 of the old section 302.3.2 did not apply to Group H and I-2 areas, the revised Table in the new section 508 shows a reduction of 1-h in fire resistance rating between all I occupancies and for F-2, S-2, U, B, F-1, M, and S-1 without any justification or compensation.

The former Table 302.3.2 specified a minimum fire resistance rating for every occupancy separation between different occupancies and never allowed a fire resistance rating to be less than one hour, even when an automatic sprinkler system is provided which allows a one hour reduction. The Exception to Section 302.2.3 (Supp) did not allow the ratings to be reduced to below one hour even when the automatic sprinkler system reduction is used. This is in contrast to the new Table 508.3.3 which has many entries indicating that no separation is required, again without justification or compensation. So how can a mixed occupancy building have separate occupancies if there is no fire resistance-rating requirement to separate such occupancies? Is this now a tenant separation issue?

It is our belief that the adoption of this Code change in the 2006 IBC has a significant detrimental impact on fire safety in buildings by arbitrarily reducing fire resistance ratings without providing any compensating safety measures. This change needs to be corrected, and a selective process of review, consideration, and justification undertaken to determine which, if any, of these changes are desirable and justifiable.

International Firestop Council.

The purpose of this proposed code change is to restore the separated uses (occupancies) concept prescribed in Section 302 of the 2003 IBC (and 2003 Supp) which was severely corrupted in the last cycle by proposed Code Change G32-04/05, and clarify the distinction between separated uses and the non-separated use options. The proposed wording is intended to be identical to that of 2003 IBC (and 2003 Supp), and renumbered for consistency in the 2006 IBC.

The committee's reasons for approving the changes was that there was no significant technical changes made by this Code Change Proposal. To the contrary, there are dozens of reductions in fire resistance ratings resulting from these changes, without justification or supporting rationale. This creates a potentially dangerous condition for certain building occupants and firefighters. The occupancy separation Table has existed in the BOCA National Building Code for a very long time, and was incorporated into the IBC since the first edition. The concept of separation of major occupancies exists in Building regulations throughout the world. There continues to be a critical need to separate adjacent occupancies of dissimilar use, with fire-resistance rated construction.

This proposed Code change would re-introduce the identical wording contained in the 2003 IBC (and Supplement). In the published "Report of the Public Hearing on the 2003 editions of the International Building Code", the committee's published reason for recommending adoption of G32-04/05 is reported as follows:

"The proposal does not have any significant technical changes from the current requirements."

In reality this code change proposals has lead to literally dozens of separate and distinct reductions in fire resistance rating requirements, in both sprinklered and unsprinklered occupancies, without justification or compensating fire safety measures of any kind. As currently published, the 2006 Code provisions in Section 508 blur the distinction between separated uses and the non-separated use options previously prescribed in Section 302.3.1. In some cases, the reductions in required fire resistance ratings are as large as 3 hours for given occupancy separations, while in others, the requirement to provide fire separations is removed altogether.

To illustrate an example, this change has unilaterally reduced the fire separation between a mixed use office and a moderate hazard warehouse from the previously existing 3-hour minimum fire separation to zero, while providing no technical justification or compensating measures. Table 302.3.2 of the 2003 IBC, as well as the Exception to Section 302.2.3 (IBC 2003 Supplement), specified a minimum fire resistance for every occupancy separation and did not permit a fire resistance rating to be less than one hour, even when an automatic sprinkler system was provided. In contrast, the new Table 302.3.2 allows numerous instances where the fire resistance ratings are waived entirely. Further, while Exception 1 of the old section 302.3.2 did not apply to Group H and I-2 areas, the revised Table in the new section 508 shows a reduction of 1-h in fire resistance rating between all I occupancies and for F-2, S-2, U, B, F-1, M, and S-1 without any justification or compensating fire safety measures being provided.

The former Table 302.3.2 specified a minimum fire resistance rating for every occupancy separation between different occupancies and never allowed a fire resistance rating to be less than one hour, even when an automatic sprinkler system is provided which allows a one hour reduction. The Exception to Section 302.2.3 (Supp) did not allow the ratings to be reduced to below one hour even when the automatic sprinkler system reduction is used. This is in contrast to the new Table 508.3.3 which has many entries indicating that no separation is required, again without justification or compensating fire safety measures. So how can a mixed occupancy building have separate occupancies if there is no fire resistance-rating requirement to separate such occupancies? Is this now a tenant separation issue?

It is our belief the adoption of this Code change in the 2006 IBC was done without thorough consideration being given to the impact on both fire resistance ratings, code users, and fire safety. This change needs to be corrected, and a selective process of review, consideration, and justification undertaken to determine which, if any, of these changes are desirable and justifiable.

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

Analysis: The term 'fire barrier' is used in proposed Sections 508.1.1.1, 508.2 and 508.3.2. During the last cycle, there was a global change to consider fire barriers as walls only, and add 'horizontal assemblies when the separation would be walls and floor/ceiling assemblies. Should the language in this proposal be revised to include 'and horizontal assemblies' for any section?

The language in the proposed Section 508.4 is currently found in Section 302.1. Should it be repeated or deleted from Section 302.1?

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

G151-06/07

509.1

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

Revise as follows:

509.1 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.

Reason: Section 509 is an unusual section that allows special provisions in unique and limited situations. A common point of confusion w/ many code users is assuming that all options allowed in Section 509 are actually required to be met at the same time. This is not the intent of Section 509. Each section within Section 509 is to be considered and applied to a building based upon the specific requirements/allowances specified solely within the specific section. Adding the proposed sentence will clarify the proper application of Section 509.

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

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

G152-06/07

509.2

Proponent: John Younghusband, P.E., Schirmer Engineering Corp.

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction ~~and~~
2. The basement and/or the first story above grade plane is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
- ~~2.3.~~ Shaft, stairway, ramp or 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.
- ~~3.4.~~ The building 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.

4-5. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.

5-6. 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.

7. The building below the horizontal assembly is Group A, B, M or R, provided the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.

Reason: A residential occupancy is less hazardous than a mercantile or parking occupancy from a fire protection standpoint. NFPA 13 - Standard for the Installation of Sprinkler Systems, classifies residential occupancies as Light Hazard Occupancy, while parking and retail are classified as Ordinary Hazard Group 1 and 2 respectively. The location of the residential occupancy within the Ground Floor Level will provide the residential occupants with improved life safety from an occupant evacuation and fire department search and rescue standpoint.

The code provisions that permit assembly, office and retail occupancies within the Type I, F.R. parking level reflect the first generation of urban mixed-use type projects. In the past, street level occupancies were typically limited to commercial type uses for functional and marketability reasons.

This fact is substantiated by the Approved code change adopted in the 1991 Uniform Building Code Section 702 (a) (Similar provisions as Section 311.2.2.1 of the 1998 UBC). A copy of this Approved code change is attached for reference purposes. Following the current trend of urban design, residential uses within the Type I, F.R. podium level are becoming more prominent. Furthermore, in consideration that retail and dining establishments (which typically contain more hazards to life safety and property protection than residential occupancies) are permitted in the Type I, F.R. podium, it is likely that the CBC never contemplated residential type uses within a parking level.

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

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

G153-06/07

509.2, 509.3

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

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a two separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction ~~when~~ where all of the following conditions are met:

1. ~~The basement and/or the first story above grade plane is of Type IA construction and is separated from the buildings~~ are separated above 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 or 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.

3-5. The building 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.

4-6. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.

~~5-7.~~ 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 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 in the basement or first story 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 ~~when~~ where the following conditions are met:

1. The allowable area of the ~~structure~~ 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 ~~the floors above the basement~~ 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 m²), and mechanical equipment rooms incidental to the operation of the building.

Reason: The purpose of this proposal is to clarify the methods used in Sections 509.2 and 509.3 to establish the equivalent of separate and distinct buildings. Currently, Section 509.2 permits a basement and/or a first story above grade plane, and Section 509.3 permits a Group S-2 enclosed parking garage located in a basement and/or first story below a Group S-2 open parking garage, to be considered a separate and distinct building if certain conditions are met. The height of the first story above grade plane is well established elsewhere in Chapter 5 but that of a basement is not. The question of whether the term "basement" applies to each floor level that is partly or completely below grade or to all floor levels that are partly or completely below grade is addressed by a related code change proposal. Assuming that the term "basement" applies to each floor level that is partly or completely below grade, it is conceivable that more than one basement could qualify as a story above grade plane. The definition of basement in Section 502.1 establishes when a basement is considered a story above grade plane but there is no restriction in the definition or elsewhere in the IBC limiting such a basement to no higher than the first (one) story above grade plane.

Once the location of the basement and/or a first story above grade plane is established, what about the floor levels below the basement and/or a first story above grade plane? Literally, they are currently excluded from the separate and distinct building below the fire-resistance-rated horizontal assembly, which is required between the upper and lower buildings in both cases. The proposed revision establishes a criterion in each case that is more precise and closer to the intent, which is to consider a portion of a building whose topmost floor is no higher than the first story above grade plane to be a separate and distinct building.

The proposed change from "floors" to "tiers" in Item 3 of Section 508.3 is for consistency with the use of "tier" for open parking garages in Section 406.3. "Structure" is revised to "building" in Item #1 of Section 509.3 for consistency with use of the term "building" in the charging statement of Section 509.3.

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

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

G154-06/07

509.2

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc., representing the Erickson Retirement Communities

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. Shaft, stairway, ramp or 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.
3. The building 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.
 4. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
 2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M, or R uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
5. 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.

Reason: Section 509.2(4) Exception #2 is being proposed to be updated to include the R-use **below** the 3-hour horizontal separation, as is already permitted by Section 508.2(3) for uses **above** the 3-hour horizontal separation.

This section's code requirements were originally from the UBC (Section 702(a)). This section was created to address mixed use construction buildings in urban areas where many cities were trying to promote mixed-use neighborhoods. The concept of these code requirements for "pedestal" buildings was a cost-effective way of allowing housing to be provided in commercial areas without jeopardizing the safety of residents. Since its placement in the UBC, and now under the IBC, it has been used to revitalize urban areas by bringing people back into the cities to live and work.

In the past few years, many projects have been proposed to use work/live units or additional dwelling units on the first floor of mixed-use buildings built under the special requirements of Section 509.2. From a fire protection/life safety standpoint, placing an R use on the first floor, below the 3-hour horizontal separation is not an issue. After all, the entire structure below the 3-hour horizontal separation is already required to be Type 1A (the highest fire resistive construction type in the Code), and is required to be protected throughout by an approved automatic sprinkler system. However, the literal text of the Exception #2 does not address an R use, which is what work/live units would also fall under.

Therefore, this code proposal would address the uses below the 3-hour horizontal separation to be consistent with the same uses above the 3-hour horizontal separation.

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

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

G155-06/07

509.2

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc.

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. Shaft, stairway, ramp or 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.
3. The building 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.
 4. The building below the horizontal assembly is shall be permitted to be a Group S-2 enclosed or open parking garage; ~~used for the parking and storage of private motor vehicles.~~

Exceptions:

1. ~~Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.~~
 2. Multiple Group A uses, each with an occupant load of less than 300; ~~or~~ Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas, and similar uses), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
5. 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.

Reason: Revisions are intended to be only editorial to make the use and intent of this section of the Code clearer to the user.

The exceptions really are not exceptions, but additional uses permitted below the 3-hour horizontal separation from the building above the 3-hour horizontal separation. Since this section on "pedestal" buildings was from one of the legacy codes (UBC), users of the other two legacy codes (BOCA & SBC) have had problems understanding the intent and application of this section's exceptions. The rewording as proposed will help clear up any confusion on properly applying which uses in the IBC are permitted below the 3-hour horizontal separation.

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

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

G156-06/07

509.5, 509.6

Proponent: Roger R. Evans, Park City Municipal Corporation, representing the Utah Chapter

Revise as follows:

509.5 Group R-2 buildings of Type IIIA construction. The height limitation for buildings of Type IIIA construction in Group 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 m²).

509.6 Group R-2 buildings of Type IIA construction. The height limitation for buildings of Type IIA construction in Group 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 1¹/₂ hours.

Reason: When you compare the differences between Group R-1 occupancies and Group R-2 occupancies and look at the fire record information that is published by NFPA, there is no justifiable reason not to extend the special provisions of Section 509 to Group R-1 occupancies.

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

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

G157-06/07

509.8

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

Revise as follows:

509.8 Group B or M with Group S-2 open parking garage above. ~~Group B or M uses located in the basement or first story below a Group S-2 open parking garage~~ A building shall be ~~classified~~ considered as a two separate and distinct building for the purpose of determining the type of construction ~~when~~ where all of the following conditions are met:

- ~~1. The basement or first story shall be Type I or II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the Group B or M uses.~~
- ~~2. The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story.~~
- ~~3. Fire separation assemblies between the open parking garage and the basement or first story use group shall correspond to the required fire-resistance rating prescribed by Table 508.3.3~~
- ~~4. Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the basement or first story use group by not less than 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Table 715.4.~~

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 building above the horizontal assembly is a Group S-2 open parking garage.
4. The building below the horizontal assembly is no more than one story above grade plane.
5. 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.
6. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503.
7. 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 open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly.
8. 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.

Reason: The purpose of this proposal is to update the provisions for consistency with other related provisions in the code and to make them more understandable to the average code user. Item #3 currently refers to fire separation assemblies, which is the only instance in the IBC of the term. A fire-resistance-rated horizontal assembly is the likely intent. Section 711 on horizontal assemblies specifies technical provisions for horizontal assemblies ensuring horizontal compartmentation through fire-resistance of the assembly and the protection of penetrations and openings equivalent to a fire-resistance rating. There are no technical provisions in the IBC, however, for fire separation assemblies. Item #3 also refers to use groups but this term was effectively eliminated from the IBC by code change proposal G14-04/05.

Item #1 permits Group B or M occupancies in a basement or first story below a Group S-2 open parking garage to be considered a separate and distinct building if certain conditions are met. A story is defined in Section 502.1 as a "portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above." Consequently, stories are established between all adjoining floors including basement floors. In a building with several floors below grade, the first story is located between the bottom two floors. A story no higher than the first story above grade plane is the likely intent.

The height of the first story above grade plane is well established elsewhere in Chapter 5 but that of a basement is not. The question of whether the term "basement" applies to each floor level that is partly or completely below grade or to all floor levels that are partly or completely below grade is addressed by a related code change proposal. Assuming that the term "basement" applies to each floor level that is partly or completely below grade, it is conceivable that more than one basement could qualify as a story above grade plane. The definition of basement in Section 502.1 establishes when a basement is considered a story above grade plane but there is no restriction in the definition or elsewhere in the IBC limiting such a basement to no higher than the first (one) story above grade plane.

Once the location of the basement or first story above grade plane is established, what about the floor levels below the basement or a first story above grade plane? Literally, they are currently excluded from the separate and distinct building below the fire-resistance-rated horizontal assembly. The proposed revision establishes a criterion that is more precise and closer to the intent, which is to consider a portion of a building whose topmost floor is no higher than the first story above grade plane to be a separate and distinct building.

Items #2, #3 and #4 of the proposal correspond to the current charging language. Items #5 and #6 of the proposal correspond to current Item #1. Item #7 of the proposal corresponds to current Item #2. Item #1 of the proposal corresponds to current Item #3. Item #8 of the proposal corresponds to current Item #4.

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

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

G158-06/07

509.9 (New)

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

Add new text as follows:

509.9 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, 509.3, 509.4 and 509.7, 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: This text is needed to clarify when two or more buildings are built atop a common parking garage that the buildings above the garage are to be considered as distinct buildings separate from one another. As an example, this will allow a four-story Type VA Group R-2 condominium building to be built as a separate building from a six-story Type IIA Group B office building. Although this may be obvious to some, I have had more than one jurisdiction interpret that multiple structures above the parking garage are actually one building and are limited to the most restrictive construction type and Use Group provisions. The proposed text legitimizes the evaluation of this example as two distinct buildings for construction type, fire separation distance, suppression, opening protectives, etc.

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

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

G159-06/07

Table 601

Proponent: Robert B. Bush, Code Source P.C.

Add table entry and footnote as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^e	B	A ^e	B	HT	A ^e	B
Structural frame ^a	3 ^b	2 ^b	1	0	1 ^h	0 ^h	HT ^h	1	0

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

h. Structural frame located within the exterior walls or on the outside of a building or structure shall be provided with 2-hour fire-resistance rating, or higher if required by Section 714.5.

Reason: To clarify the code and increase compliance to an often missed code section. Frequently architects and code enforcers miss the Section 714.5 requirements because they assume the structural frame fire resistance only needs to comply with Table 601 requirements, and hence, do not coordinate the requirements with Section 714.5. An additional footnote "h" to Table 601 will greatly increase the awareness of this important coordination to Section 714.5.

There is no survey I know of to substantiate the percentage of architects not complying and code enforcers not enforcing the fire resistive ratings required by Section 714.5 that supersedes the Table 601 structural frame fire resistance requirements. However, it has been my personal experience as a certified plan reviewer for some 16 years, that the Section 714.5 requirements have been missed among a high percentage of architects and code enforcers (these similar requirements have been in the BOCA code for at least that long). I have seen many approved Type IIIB pre-engineered metal buildings (whose structure essentially complies as Type IIB construction) that the supporting structure for the exterior walls has not been 2-hour fire resistance rated and yet the structure has combustible interior construction such as wood mezzanines floor structure, wood stairs, wood interior partitions, and etc. If you ask many architects and code enforcers, you will concur.

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

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

G160-06/07

Table 601

Proponent: Herb Yingling, Greenville County, South Carolina, representing himself

Add new footnote to table as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT
Structural frame ^{a,h}
Bearing walls
Exterior ^{a,h}
Interior

a. through g. (No change to current text)

h. Not less than the fire-resistance rating as referenced in Section 714.5.

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

Reason: The purpose of the proposed change is to insure navigation to applicable corresponding section of the code. The reason is to coordinate the appropriate code sections with the table.

The section is commonly overlooked when determining the required ratings of structural members. The most common type of construction that is affected is IIIB construction, however all the "B" types are affected by the section.

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

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

G161-06/07

Table 601

Proponent: Lorin Neyer, Office of Statewide Health, Planning & Development, State of California

Revise table as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^e	B	A ^e	B	HT	A ^e	B
Structural frame	3 ^b	2 ^b	1	0	1	0	HT	1	0
Bearing walls									
Exterior ^g	3	2	1	0	2	2	2	1	0
Interior	3 ^b	2 ^b	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^f	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction Including supporting beams and joists	2	2	1	0	1	0	HT	1	0
Roof construction Including supporting beams and joists	1 ^{1/2} ^c	1 ^{c,d}	1 ^{c,d}	0 ^d	1 ^{c,d}	0 ^d	HT	1 ^{c,d}	0

(Portions of table not shown do not change)

For SI: 1 foot = 304.8 mm.

- a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.
- b. Roof supports: Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- c. Except in Group F-1, H, M and S-1 occupancies, fire resistive protection of structural members ~~shall not be required~~, including protection of roof framing and decking other than the structural frame, shall not be required where every part of the roof construction is 20 feet or more above any floor immediately below. ~~Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.~~
- d. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- e. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
- f. Not less than the fire-resistance rating required by other sections of this code.
- g. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

Reason: This code change proposal modifies Footnote c so as not to allow the structural frame elements of roofs in Groups A, B, E, F-2, I, R, and S-2 occupancies to have the required fire resistance rating omitted where the entire roof construction is located more than 20 feet above the floor directly below. Currently, this footnote does not allow the roof construction of fire resistance ratings to be reduced at all for Group F-1, M, and S-1 occupancies regardless of the roof height above the floor. This proposed modification would apply to all fire resistance rated types of construction where the roofs have a one hour fire resistance rating, as well as to Type IA construction which requires a one and one half hour fire resistance rated roof. These would include Types IIA, IIIA, and VA construction where the structural frame is also required to have a minimum one hour fire resistance rating. Type IB construction, which is also affected, would require a minimum two hour fire resistance rated structural frame and Type IA construction would require a minimum three hour fire resistance rating for the structural frame.

We have focused this revision on exempting the structural frame from the allowable reduction in the required fire resistance ratings for the roof construction. We believe this is a structural integrity issue involving the overall structural performance of the building. The structural frame is critical to the overall structural stability of the building since it includes not only the columns, but also all the girders, trusses, and beams that connect directly to the columns to provide lateral support for those columns, as well as to provide a rigid frame for the overall building construction to hold it together. We don't believe the fire resistance rating of the structural frame should be eliminated simply because it is located in the top story of the building that contains a roof greater than 20 feet above the floor immediately below.

It is still possible to have an uncontrolled fire occur on the top story which could threaten the overall structural integrity of the building. Since the physics of fire dictate that the heat and flames from the fire rise to the roof level, simply moving the roof height up to a minimum of 20 feet above the floor will not significantly reduce the fire exposure to the structural frame supporting that roof, unless that roof is extremely high and the area of the room in which the roof is located is extremely large so that there is a significant volume that can absorb some of the heat generated by the fire. However, the hot gas layer will still accumulate at the underside of the roof construction and continue to expose the structural frame supporting the roof and the building itself. A localized collapse of the roof structure would certainly occur in an uncontrolled fire condition but we certainly would not want to see a catastrophic failure resulting from the inability of the structural frame to withstand the fire exposure.

Obviously, this is also a fire fighter safety issue regarding structural collapse of the building and, in particular, the entire roof assembly. Fire departments are becoming increasingly concerned about fire fighter safety when fire fighters are required to go onto the roof to vent the fire, as well as when they are required to go into very large buildings to reach the seat of the fire. It follows that the larger the building, the more risk is posed to a fire fighter that must gain access to a fire located in the center of that building because of the time required to gain access, as well as to leave if threatening conditions develop.

The reduction in roof ratings is an especially important issue to the local fire departments which must often access the roof for fire fighting purposes as well as to ventilate the building. Reducing the fire resistive protection for the roof structural elements beyond that presently allowed by the 1997 UBC would pose an additional risk to the fire fighters attacking fires in these potentially large buildings in California. Furthermore, roof construction in buildings required to be of noncombustible construction should not be allowed to have combustible elements even if they are fire retardant treated wood since they will still burn. This can pose a similar risk to the local fire department by resulting in a premature failure of the roof construction during a fire. This would also add considerably more fire load to an otherwise noncombustible building.

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

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

G162-06/07

Table 601

Proponent: Susan Lamont, Arup Fire, San Francisco, CA

Revise table as follows:

TABLE 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

(No changes to table text)

For SI: 1 foot = 304.8 mm.

- a. through b. (No change to current text)
- c. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members. Where it can be shown by calculation that structural stability will be maintained for the duration of an agreed credible worst case fire scenario the prescribed value of 20 ft can be decreased as appropriate in any occupancy type.
- d. through g. (No change to current text)

Reason: To enhance the current recommendation which already recognizes that a fire in a tall space can have limited impact on structural elements remote from the fire.

To allow the structural design and fire load in a tall space to be treated on a case by case basis allowing for greater innovation and value engineering of structure in tall spaces which are often the focal point of an architectural design.

The 20 ft rule is prescriptive and may be conservative or non-conservative in any particular case. By permitting a performance based approach the concept of the structure at high level being cooler than near ground can be maintained but checked on a case by case basis in any occupancy.

Performance based tools are available to calculate credible design fires, the heat exposure from the fires to the structure and the resulting stability of the structural member (see Bibliography list for some examples).

Bibliography:

BS EN 1991-1-2:2002 Eurocode 1: Actions on structures — Part 1-2: General actions — Actions on structures exposed to fire, British Standards Institution.

BS EN 1993-1-2:2005 Eurocode 3: Design of steel structures — Part 1-2: General rules — Structural fire design, British Standards Institution.

BS5950:Part 8:1990 Code of practice for fire resistant design.

Buchanan, A.H, Structural Design for Fire Safety, Wiley, 2001:

Drysdale, D.D. (1998), "An Introduction to Fire Dynamics" 2nd Edition.

Milke J.A. Analytical methods for determining the fire resistance of steel members, Chapter 4-9, SFPE handbook of fire protection engineering, 3rd Edition, 2002.

Pettersson O., Magnusson S.E. and Thor J. (1976), "Fire Engineering design of steel structures", Swedish Institute of Steel Construction.

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

Analysis: There are related code changes submitted by this proponent to the IBC FS committee.

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

G163–06/07

Table 602

Proponent: Rockwood Edwards, Schirmer Engineering Corporation

Revise table as follows:

**TABLE 602
 FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS
 BASED ON FIRE SEPARATION DISTANCE^{a, e}**

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY Group H	Occupancy Group F-1, M, S-1	OCCUPANCY Group A,B,E,F-2,I, R, S-2, U ^b
$X < 5^c$	All	3	2	1
$5 \leq X < 10$	IA	3	2	1
	Others	2	1	1
$10 \leq X < 20$	<u>IA, IB</u>	<u>2</u>	<u>1</u>	<u>1</u>
	<u>IIB, VB</u>	<u>1</u>	<u>0</u>	<u>0</u>
	<u>Others</u>	<u>1</u>	<u>0</u>	<u>1</u>
$20 \leq X < 30$	<u>IA, IB</u>	<u>2</u>	<u>1^{f,g}</u>	<u>1^{d, f, g}</u>
	<u>IIB, VB</u>	<u>1</u>	<u>0</u>	<u>0</u>
	<u>Others</u>	<u>1</u>	<u>0</u>	<u>1^d</u>
$30 \leq X < 40$	<u>IA, IB</u>	<u>2</u>	<u>1</u>	<u>1^d</u>
	<u>IIB, VB</u>	<u>1</u>	<u>0</u>	<u>0</u>
	<u>Others</u>	<u>1</u>	<u>1</u>	<u>1^d</u>
$X \geq 30$	All	0	0	0

For SI: 1 foot = 304.8 mm.