Code Technology Committee
Area of Study – NIST World Trade Center Recommendations

2009/2010 Cycle
Code changes related to the CTC area of study noted above

The following are code changes related to the CTC NIST World Trade Center Recommendations Area of Study that will be considered at the 2009/2010 Code Development Hearings in Baltimore.

FS17–09/10
705.6

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating. Interior structural elements which brace the exterior wall but are not within the plane of the exterior wall nor on the outside of it shall have the fire resistance rating required by Table 601.

Reason: This section of the code is a direct descendent of the following section of the BOCA National Building Code which read in part:
Section 302.2.3 Method 3: The fire resistance rated wall shall be so constructed that it will remain structurally in place against an exterior exposing fire, for the duration of time indicated by the required fire resistance rating.

The 2006 IBC, Section 714.5, required all load-bearing structural members located within an exterior wall or exterior to it (outside of the exterior wall meaning outdoor side, not the enclosed side) to have the higher of the fire resistance ratings required for that element in:

(1) Table 601;
(2) Table 601 for the exterior bearing wall; or,
(3) Table 602 based upon fire separation distance.

It may be inferred from this requirement that load-bearing structural members located internally within the building need only have the fire resistance rating required of them in Table 601. The fire resistance ratings for exterior walls are based upon exterior exposure or conflagration.

Thus, it is not reasonable to assume that because an interior element braces, to any extent, an exterior wall that it follows that the bracing element interior to that exterior wall must then have the same fire resistance rating as the exterior wall. The 2009 IBC has this requirement relocated to 705.6 and the base fire resistance requirements were "mixed with fire separation distance requirements" so the base requirement is not so readily discernable.

This proposal would clarify the intent of Section 705.6. It is clear that the code has a long standing provision which permits the various elements of a building for a given construction type to have differing fire resistance ratings based upon the function of the individual element and the duration of time deemed necessary for that element to continue to perform that function.

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

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

ICCFILENAME: FRANCIS-FS1-705.6

FS18–09/10
705.6

Proponent: Dennis Richardson PE, dbr group inc. representing self

Revise as follows:

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*.

Exceptions:

1. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 2 hours if they are one hour fire resistance rated or heavy timber construction and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 2 hours if they are one hour fire resistance rated or heavy timber construction and the building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 and the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for parapets.
3. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 1 hour in construction that is not otherwise fire-resistance rated if the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
4. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 1 hour in construction that is not otherwise fire-resistance rated if the building equipped with an automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 and the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for parapets.

Reason: Section 705.6 which requires structural stability of exterior fire resistance rated walls is rarely, if ever, enforced because it provides no criteria for "sufficient structural stability" and does not consider protection to supporting elements provided in part by automatic sprinkler systems and partially by passive fire resistance. An informal phone survey of a number of building officials and code consultants including review of numerous interpretation manuals did little to shed light on the application of this section. Lack of enforcement and a wide range of interpretations justifies this section needs to be clarified or removed from the code.

The proposed exceptions are superior to the existing code language because they provide a prescriptive way to address the intent of this code section giving credit to the combination of fire sprinklers and passive fire resistance of one hour fire restive or heavy timber construction. Credit is given for NFPA 13 systems referenced in 903.3.1.1 and NFPA 13R or 13D systems referenced in 903.3.1.2 or 903.3.1.3 of the IBC.

Footnote c. of Table 601 refers to heavy timber construction as an equivalent to one hour fire resistance rated construction.

Footnote d. of table 601 allows non rated construction with a NFPA 13 sprinkler system throughout to be substituted for 1-hour fire-resistance rated construction provided the system is not otherwise required by the 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. Footnote c. goes on to state the 1-hour substitution for the fire resistance of exterior walls is not permitted.

This proposed code change does not provide an exception to the fire resistance rating for the exterior wall itself or for the elements providing vertical support of the wall. The code proposal only clarifies the anticipated effectiveness and required protection of secondary structural elements providing out of plane stability for the fire resistance rated exterior wall. As such the proposed use of the proposed exceptions would not disqualify the use of sprinklers for allowable area or height increases.

This proposed code change relies on NFPA 13R and 13D sprinkler systems when used for residential construction. It is acknowledged these systems are based on lower water flow than a NFPA 13 system and do not require sprinkler heads in attic areas. However residential construction typically is highly compartmentalized typically with one hour construction between multi-family units and noncombustible interior finish materials and

a great deal of structural redundancy. Because of the lack of sprinkler heads in attic areas, the proposed exceptions as written for 13R and 13D systems only apply if the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for elimination of parapets. These exceptions for parapets either rely on additional passive fire resistance in lieu of a parapet or are limited by size or location of the structure.

In addition to this change, a proposal is also being submitted to add Section 1604.14 to establish out of plane structural design criteria for the instances where these exceptions would not apply.

The author of this proposed code change acknowledges there is little data or full scale research to specifically address this issue however the current code language provides absolutely no basis or guidance whatsoever as to the intent or application of this code section. Because of the wide variety of configurations materials and conditions and the need to show performance of structural stability during a wide variety of fire conditions, it is not clear how a structural engineer would provide a rational analysis if requested under the present code language.

Because of this Section 705.6 appears to be almost universally ignored by designers and code officials alike. At a minimum, this code change proposal is intended to provide a reasonable basis (or at minimum a starting point for a healthy discussion) for consistent application and enforcement acknowledging the contributions of both active systems and passive fire-resistance construction.

Cost Impact: Since the proposed code change incorporates exceptions to be utilized if desired by the designer, it is anticipated this change would result in a cost savings.

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

ICCFILENAME: RICHARDSON-FS1-705.6

G3–09/10
202

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

SECTION 202
DEFINITIONS

SECONDARY MEMBERS. The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction and roof construction not having direct connections to the columns; and
3. Bracing members other than those that are part of the primary structural frame.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

> Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

The text for "primary structural frame" and "secondary members" was originally developed for placement in Section 704 on Fire-resistance Ratings of Structural Members (Section 714 in the 2006 IBC). At the most recent final action hearings, however, this text was relocated to Section 202 essentially without revision. In the 2009 IBC, bracing members are defined as members of the primary structural frame where they are essential to the stability of the primary structural frame under gravity loading regardless of whether they are designed to resist gravity loads. All other bracing members are defined as secondary members.

This proposal corrects the oversight that roof construction should be treated the same a floor construction within the context of secondary members.

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

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

ICCFILENAME: HEILSTEDT-G7-202.doc

G41–09/10
403.2.4, Table 403.2.4

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC) and Lawrence

G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

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

Delete without substitution as follows:

~~**403.2.4 Sprayed fire-resistive materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.~~

~~**TABLE 403.2.4**~~
~~**MINIMUM BOND STRENGTH**~~

~~**HEIGHT OF BUILDING**~~ [a]	~~**SFRM MINIMUM BOND STRENGTH**~~
~~Up to 420 feet~~	~~430 psf~~
~~Greater than 420 feet~~	~~1,000 psf~~

~~For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m^2~~
~~a. Above the lowest level of fire department vehicle access~~

Reason: Heilstedt - The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

> Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

The current provisions for minimum bond strength were added to the code via G68-06/97. The following is the committees reason for inclusion:

Committee Reason: Although the data which provides technical support was not provided within the proposal, this does go along with the NIST recommendations and should provide better safety in high-rise buildings. Using the greater bond strengths will increase the probability that the protection will stay in place and will reduce the likelihood of being dislodged. These factors should provide for a longer time of safety. Placing the requirements in the high-rise provisions of Chapter 4 instead of within Chapter 7 makes sense because they are only applicable to high-rises and will be more likely to be found within that section. The committee did agree with the different bond strength requirements based upon the thought the taller buildings are at a higher risk and that items such as the vibration of tall buildings will affect the long term performance. Based on testimony which was provided, the cost impact of this requirement was considered as being relatively small. The higher density products which are currently available will generally meet these requirements. The modifications included a revision of the terminology "spray applied" to "sprayed" to be consistent with the action of FS156-06/07 and to create a more global point of reference for building height by moving footnote a to the main title of the first column.

In submitting a public comment to G69-07/08 last cycle to remove the minimimum and retain the 150 psf in Chapter 17, CTC noted that the current provisions for minimum bond strength were the results of G68-06/07 last cycle. As noted in the reason statement for the code change, it notes "The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM)." The proposal further sites Recommendation 6 of the NIST WTC report which calls for improvement of the in-place performance of SFRM. NIST Recommendation 6 reads as follows:

> NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing or insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.

The CTC notes that the prior to the approval of the increased bond strength in Table 403.15 that the code mandated cohesive/adhesive bond strength, regardless of height, was 150 psf in Section 1704.10.5. In fact, this section has remained unchanged and was not coordinated with the new provisions in Table 403.15.

Based on input received by the CTC, the CTC position remains that the bond strength should not be increased as a function of height. As noted in the NIST recommendation, the concern is one of in-service performance of the SFRM which means the material must remain in place to perform its intended function, regardless of height. This is an inspection related issue, one for which the CTC submitted code change S39-06/07 to improve the inspection provisions, including:

- Increased number of sampling locations
- Specific sampling for columns, beams, joists and trusses
- Physical and visual tests for: substrates; thickness; density, bond strength

S39-06/07 was approved and the provisions will be incorporated in the 2009 edition of the IBC.

There is no credible technical evidence or documented experience to indicate that the increased minimum bond strength requirements specified in the subject text and Table improve the long term durability of sprayed fire –resistive materials (SFRM) in high-rise buildings or improve the chances of SFRM to be in place when it is needed (in the event of a fire). The single proven effect of these increased bond provisions is to dramatically increase the SFRM installed cost by up to 250%. SFRM minimum bond strength of 150 psf (Section 1704.12.6), in conjunction with inspections and field tests, specified in Section 1704.12, are adequate to ensure SFRM is in place after completion of the construction phase. Regular inspections and timely repairs are needed to ensure SFRM in-place condition over the life of the building, regardless of the bond strength of SFRM.

A survey of the commercially available SFRM products in terms of their bond strength and density, conducted by the American Iron and Steel Institute (AISI) in 2007 clearly indicates that the provisions in Section 403.2.4 and Table 403.2.4 are specifically calibrated and targeted to ban standard-density SFRM products from the high-rise market – i.e., these provisions create an artificial commercial barrier, but do not address any measurable risks or safety concerns tied to any meaningful bond strength values (in terms of SFRM in-place durability).

The current provisions in Section 403.2.4and Table 403.2.4 resulted from proposal G68-06/07 (and further slightly modified by proposal G68-07/08), based on misleading technical information and flawed cost impact analysis provided in the proposal and relevant testimonies during the public hearings:

- G68-06/07 reason statement suggested "building sway" as a "known" "initiating event" for SFRM dislodgement. Testimony during the public hearings also suggested building vibration as a possible cause for SFRM dislodgement. To date, no evidence has been found to document either of these claims.
- G68-06/07 reason statement noted that "The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM)", seeking to achieve the improvements called for in Recommendation 6 of NIST WTC Report. Testimonies during the hearings further suggested that proposal G68-06/07 is somehow based on NIST WTC Investigation and its recommendations. In fact, NIST Recommendation 6 reads as follows:

  > "NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems."

  There is nothing in Recommendation 6, or in any other part of the NIST WTC Investigation Report, to justify the immediate need to arbitrarily increase the SFRM bond strength. Nothing in the published NIST report suggested that the SFRM bond strength was inadequate for any of the intended purposes. The compiled records actually indicated that WTC towers endured numerous fires prior to 9/11 with minimal or no structural damage. Nothing in the NIST Report suggested that any existing SFRM product with higher bond strength and/or higher density would have performed better, or would have changed the sequence or the outcome of events.

- G68-06/07 proposal noted that "Many tall buildings already utilize these higher strength materials". However, in 2006, there was only one high-rise building known to utilize medium-density SFRM throughout the building (the reconstructed WTC 7), and the owner did it for understandable reasons In fact, the absence of long-term nation-wide experience with the "throughout" application of medium-density and high-density SFRM in high-rise buildings should be a cause for concern – due to the lack of long term data to support their use.
- G68-06/07 offered flawed cost impact analysis stating that the associated cost increase will be only marginal. In fact, credible estimates for real projects indicated very significant cost increase for installed medium-density and high-density SFRM. Independent estimates by government agencies (reported in G69-07/08) indicated that minimum bond strength requirement of 430 psf increases the SFRM cost by over 50%, while the requirement of 1000 psf increases SFRM cost by about 170%. Other independent estimates in the 2007 AISI report show similar cost increases: by over 50% for medium-density SFRM, and by over 230% for high-density SFRM. These increases cannot be characterized as "marginal" or "relatively small". The cost impact of Table 403..2.4 provisions needs to be fully considered, and society's fire protection resources need to be effectively allocated in a meaningful way.
- Several testimonies during the public hearing exploited the notion of standard-density SFRM dislodgement under its own weight for no apparent reason or due to the lack of bond strength. In fact, SFRM dislodgement are almost always linked to very specific reasons that are irrelevant to bond strength – over the building lifetime, the overwhelming majority of documented dislodgement cases are caused by direct contact/impact removals of SFRM associated with human activities such as construction, demolition, remodeling, testing, structural inspections, maintenance operations, electrical/mechanical installations, and also, associated with equipment failures, such as water leaks, improper elevator operations, and similar reasons. The information compiled in WTC Investigation Report NCSTAR 1-6A clearly illustrates typical cases, e.g.:

  > "Section 3.7 with photographs in Figures 3-5 through 3-10 states that, "There were many instances where SFRM had obviously been dislodged in the process of installing utilities. In some cases hardware was attached directly to the lower chords and SFRM was dislodged. These damaged areas should have been repaired when the various trades had completed their work". Section 3.7 also states that "the overall views of the trusses showed that regions of missing insulation were minor in extent when compared with the total area of applied SFRM".
  >
  > Figure A-36 points to SFRM damage on trusses due to "tenant construction work" or "works over the years in the ceiling" by the Port Authority.
  >
  > Figure A-37 points to SFRM damage on trusses "during demolition after tenants move out" as "ductwork, partitions, hangers, etc. are removed".
  >
  > Figure A-38 points to SFRM "damaged by installation of new construction".
  >
  > Figure A-39 points to SFRM "disturbed by remodeling operations"
  >
  > Figure A-49 points to SFRM re-occurring "extensive damage" in the elevator shafts caused by "the slack condition in compensating cables, especially on shuttle cars, causing a chafing condition against finished spray-on fireproofing on structural steel within hoistways".
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  > Figure A-56 and A-57 (excerpts from LERA reports dated 1993 and 1995) point to SFRM damage in elevator shafts due to "rubbing of the hoist cable against the face of column", or "due to testing purposes". In one instance, the LERA reports also point to the installation of bracket as the cause for missing fireproofing.
  >
  > The entire compilation of maintenance and inspections documents in the published reports of NIST WTC Investigation does not contain a single case of SFRM dislodgement linked to the lack of SFRM bond strength, despite the fact that all structural steel and steel joists in WTC towers was primed (SFRM application over primed and/or painted steel is known to reduce bond strength).

Similar causes of SFRM dislodgement, irrelevant to bond strength, were reported in the 2007 AISI report of building architects and construction contractors to evaluate their use of SFRM and their experiences with it. This survey is more relevant to the initial construction and/or major renovation phases in buildings' lifetime, and identifies intentional removal of SFRM by construction trades as the primary cause of SFRM dislodgement.

In summary, the two leading causes of SFRM dislodgement during construction and maintenance of buildings are:

- Primary cause - intentional removal of SFRM associated with human activities, such as construction, renovation, electrical/mechanical installations, testing, inspections, maintenance operations, etc. This type of SFRM dislodgement is completely irrelevant to SFRM bond strength. Only inspections and timely repairs could address intentional removal of SFRM.
- Secondary cause - unintentional/accidental removal of SFRM associated with human activities and equipment failures. While the use of higher-density SFRM products could slightly reduce dislodgements associated with some accidental abuses, such as light abrasive actions and light impacts, existing medium-density and high-density SFRM products are still by far incapable to substantially reduce dislodgements or address all common causes of accidental removals (e.g. water leaks, repeated and stronger abrasive actions and impacts, etc). Concealment of SFRM-protected steel elements in protective envelopes (e.g. gypsum board) or behind suspended ceilings is the most effective way in avoiding accidental dislodgement due to most accidental impacts and abrasions. Again, only inspections and timely repairs could adequately address unintentional/accidental removal of SFRM.

Analysis of Proposed Change G68-06/07 to the 2006 Edition of IBC", by Farid Alfawakhiri, Ph.D., American Iron and Steel Institute, January 2007.
Bibliography: NIST NCSTAR 1, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Final Report on the Collapse of the World Trade Center Towers", National Institute of Standards and Technology, September 2005 (available at http://wtc.nist.gov/).

Carino et al, NIST NCSTAR 1- 6A, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Passive Fire Protection", National Institute of Standards and Technology, September 2005 (available at http://wtc.nist.gov/).

Perry - In their approval of the new SFRM requirements during the 2006/2007 cycle, the Fire Safety Committee specifically noted that neither technical substantiation nor cost data had been provided to the committee. Last cycle (2007/2008), cost information was provided to the committee, clearly indicating that costs are far beyond the moderate 'incremental' increases alluded to by proponents last cycle. The Fire Safety Committee voted to maintain the increased SFRM bond strength provisions, "based on a lack of technical substantiation to take them out".

This committee is on record that they had no technical substantiation when they added this requirement to the code, yet they now will not remove the provisions unless they receive technical substantiation?

There is no evidence that arbitrarily tripling (from 150 psf to 430 psf) the bond strength of SFRM will provide any additional degree of safety in 75' tall buildings, and no evidence that increasing the bond strength by a factor of 7 (from 150 psf to 1000 psf) will provide any additional degree of safety in buildings >420' in height.

The extent of the cost impacts calculated by both GSA and the steel industry make it clear that the first response to this provision, if it remains, will be to look for alternatives. There has been no explanation from those touting the need for increasing SFRM bond strength for how a gypsum-board encased column (which can achieve the required hourly ratings) would compare to columns with any of the various types of SFRM.

Cost Impact: Heilstedt - The code change proposal will not increase the cost of construction.
Perry - The code change proposal will not increase the cost of construction. This change will decrease the cost of construction.

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

ICCFILENAME: HEILSTEDT-G6-403.2.4.doc

G42–09/10
403.2.4

Proponent: Farid Alfawakhiri, American Iron and Steel Institute (AISI)

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

Revise as follows:

403.2.4 Sprayed fire-resistant materials (SFRM). The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

TABLE 403.2.4
MINIMUM BOND STRENGTH

HEIGHT OF BUILDING [a]	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	~~430~~ 250 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m^2.

a. Above the lowest level of fire department vehicle access.

Reason: This proposal attempts to balance reasonable economic considerations with safety concerns (whether substantiated or not) in buildings 75 ft to 420 ft in height. The proposed SFRM minimum bond strength of 250 psf is economically feasible, because it can be achieved with the majority of standard-density SFRM products and attention to application technology practices. The proposed 250 psf bond strength is significantly higher that the 150 psf SFRM minimum bond strength (Section 1704.12.6) required in low and mid-rise buildings.

The current requirement of SFRM minimum bond strength of 430 psf in Table 403.2.4 is not tied to any measurable risks or meaningful performance/durability criteria, i.e. there is no evidence that this increased bond strength requirement reduces SFRM dislodgement or improves the chances of SFRM to remain in place. However, the 430 psf bond strength requirement effectively bans standard-density SFRM products from the high-rise market and dramatically increases the SFRM installed cost by over 50%.

Buildings 75 ft to 420 ft (roughly 6 to 35 stories) in height are very common in urban areas, and they do not pose very high evacuation risks or very high loss risks, associated with "super-high-rises". The broad and lengthy experience with these buildings has not resulted in any documented cases of structural fire damage (let alone structural failure due to fire) linked to poor SFRM bond strength. Therefore, the unsubstantiated and expensive requirement of 430 psf SFRM bond strength can hardly be justified.

The current provisions in Section 403.2.4and Table 403.2.4 are the result of code change proposal G68-06/07, based on misleading technical information and flawed cost impact analysis, stating that the associated cost increase will be only marginal. However, credible estimates for real projects indicated very significant cost increases associated with the substitution of standard-density SFRM by medium-density SFRM. Independent estimates by government agencies (reported in G69-07/08) indicated that minimum bond strength requirement of 430 psf increases the SFRM installed cost by over 50%. Other independent estimates commissioned by the American Iron and Steel Institute (AISI) show similar cost increases. The details of these estimates are provided in the substantiation report referenced below. These increases cannot be characterized as "marginal".

AISI supports cost effective code changes that will improve the real world performance of SFRM. We share the desire to take action that would adequately respond to the events of September 11 and address credible safety concerns. Unfortunately, we believe that the current provisions of 403.2.4 achieve marginal (if any) risk reduction and they have economic implications that are not cost effective. We urge the membership to support this proposed revision.

Substantiation: "Analysis of Proposed Change G68-06/07 to the 2006 Edition of IBC", by Farid Alfawakhiri, Ph.D., American Iron and Steel Institute, January 2007 (available at http://www.iccsafe.org/cs/cc/ctc/WTC/resource/AISI_Analysis_of_Bond_Strength.pdf).

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

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

ICCFILENAME: ALFAWAKHIRI-G1-TABLE 403.2.4

G44–09/10

403.4.5, 403.4.8.1, 708.14.1, Chapter 35; IFC 508.1.5 (IBC [F] 911.1.5)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC GENERAL

1. Add new text as follows:

403.4.5 Video surveillance system. A video surveillance system installed in accordance with NFPA 731, shall be installed in each elevator lobby provided in accordance with Section 708.14.1 and at every fifth floor of each required stairway and connected to an approved, constantly attended station. The surveillance system shall not be required to provide positive visual recognition of individual persons.

(Renumber subsequent sections)

2. Revise as follows

403.4.8.1 Emergency power loads. The following are classified as emergency power loads:

1. Exit signs and *means of egress* illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems;
5. Video surveillance systems;
6. Fire alarm systems; and
7. Electrically powered fire pumps.

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements of Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code. In high-rise buildings the elevator lobby shall be provided with a video surveillance system installed in accordance with NFPA 731.

Exceptions:

1. through 7. (No change to exceptions)

3. Add new standard to Chapter 35 as follows:

NFPA	
731-2008	The Standard for the Installation of Electronic Premises Security Systems

PART II – IFC

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire-command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, firefighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. Video monitoring for video surveillance system required by this code.

Reason: This proposal adds new requirements to the code for high-rise buildings. The purpose of this change is to increase the ability of firefighters, and other emergency responders, to develop a clear picture of conditions throughout the building which will enable them to better manage evacuation, fire suppression and other emergency response activities. The purpose is also to enhance the safety of emergency responders by enabling them to maintain better situational awareness.

The National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy amply documented the tactical and informational difficulties experienced by emergency responders and occupants during the WTC event. Similar difficulties occur in much smaller events and they place lives at risk.

The Code already requires many systems which enhance emergency responder and occupant awareness. Their use can be improved and they can be further supplemented. Recommendation 23 of the WTC Report specifically calls for:

The establishment and implementation of detailed procedures and methods for gathering, processing, and delivering critical information through integration of relevant voice, video, graphical and written data to enhance situational awareness of all emergency responders.

This proposal seeks to improve responder awareness of conditions in the building to assist in management of an incident and improve the existing fire command center to enhance its value. Awareness is improved by requiring control center monitoring of video surveillance in stairway shafts and elevator lobbies. With the introduction of dedicated fire service elevators and occupant egress elevators into the IBC, the necessity of monitoring the status of the elevator lobbies becomes even more significant.

There will be those opponents that will claim that that the amount of information generated by the video monitoring in a large building will cause "information overload". They will question the ability of the staff in the fire command center to observe all of the required video feeds at once. In response to this, please be aware that there is commercial off-the-shelf "intelligent software" that is available such that the staff of the fire command center need not observe all of these feeds; the software is "event driven" and will select information that is pertinent and display just this information. This software is currently available off-the-shelf from companies such as Johnson Control and Honeywell. The Port Authority of New York and New Jersey is currently installing a system to monitor the perimeter of the Newark airport by the use of *ONE* video screen. Clearly the perimeter of this airport is substantially larger than the portions of the building that are required to be monitored as a result of this code change. By requiring these video feeds, the situational awareness of the staff in the fire command center is substantially increased. While researching the availability of this software, we were informed by Mr. Alan Reiss the building manager of the World Trade Center, that he was unaware of the magnitude of the event on September 11, 2001. In fact, he commented that the people at home watching the television had a better situational awareness than he did because of the lack of information available at the fire command center. This has to be changed and this proposal will change it.

Bottom line, the video monitoring system will provide fire and emergency responders' immediate information on the life safety condition and status of the areas noted. Having such ability will exceed any expense incurred for the installation of the video monitoring system - the expense is minor to the benefit of the system. (Note: Regardless of this requirement, electronic data access systems can be installed for a reasonable cost in most buildings today). A video monitoring system will provide fire and emergency responders with accurate and up to date information on the condition and activities of the given areas for emergency responders to make tactical decisions under emergency conditions. With that said, the TRB committee encourages consideration and support for this proposal.

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Referenced Standards

National Fire Protection Association Standard 731, the Standard for the Installation of Electronic Premises Security Systems

Cost Impact: The code change proposal will not increase the cost of construction. These proposed amendments will increase the cost of construction, but, the increase will be modest when viewed as a percentage of total construction costs.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 731, 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 September 24, 2009.

PART I – IBC GENERAL

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

PART II – IFC

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

ICCFILENAME: LEWIS-G3-403.12.1.doc

G46–09/10
403.5.2, 3008.4

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC); Bill Ziegert, representing Smoke Guard, Inc.

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

2. Revise as follows:

403.5.2 Additional exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in building height, one additional exit stairway meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of exits required by Section 1021.1. The total width of any combination of remaining exit stairways with one exit stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stairway required by this section.

~~**Exception:** An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.~~

2. Delete without substitution:

~~**3008.4 Additional exit stairway.** Where an additional means of egress is required in accordance with Section 403.5.2, an additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with this section.~~

Reason:

Thornberry: We are proposing to delete the Exception to Section 403.5.2 as well as Section 3008.4 which allow the use of occupant evacuation elevators in lieu of the additional exit stairway where required by Section 403.5.2 for super high-rise buildings (buildings greater than 420 ft in height). We believe this technology is too new and unproven to allow it to substitute for a required means of egress. This position is also consistent with Section 1003.7 Elevators, Escalators and Moving Walks which prohibits elevators from being used as a component of a required means of egress. Until such time as occupant evacuation elevators (which are allowed to be used on a voluntary basis without reducing the required means of egress) have proven to be safe, reliable, and effective, this exception should be deleted from the code.

Ziegert: When the concept of Occupant Evacuation Elevators was proposed during the Palm Springs hearings in 2008, while many committee members were in favor of such a concept, the change was Disapproved primarily because it sought a tradeoff of reducing exit stair capacity (width). The proponent brought this change back to the Minneapolis Final Action hearings with substantial modifications and replaced the reduction in exit stair width with this alternate tradeoff to reduce the third stair in High Rise buildings over 420 feet (a different form of tradeoff but still a reduction in exit capacity). Justification for this tradeoff of exit capacity was never sufficiently provided, particularly when one recognizes that the elevator occupant evacuation system will only be operational until the Fire Service arrives (typically in 10 minutes or less from the first alarm). At this time Phase 1 Elevator Recall will normally be implemented which will immediately terminate the use of elevators for occupant evacuation. Following that, occupants needing to use stairs for evacuation in these very tall buildings would be limited to only the two stair systems, rather than the three stair systems the code currently mandates.

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

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

ICCFILENAME: THORNBERRY-G6-403.5.2

G47–09/10
403.5.4

Proponent: David S. Collins, FAIA, The Preview Group, Inc., The American Institute of Architects

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

Revise as follows:

403.5.4 Smokeproof enclosures. Every required exit *stairway* serving floors more than 75 feet (22 860) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1020.1.7. The smokeproof enclosure shall be continuous to the level of exit discharge.

Exception: Portions of stairways which extend to serve floors below the level of exit discharge shall not be required to comply with Sections 909.20 and 1020.1.7 provided the portion of the stairway below the level of exit discharge is separated from the smokeproof enclosure with not less than 1-hour fire barriers constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Reason: This code change clarifies where a smokeproof exit enclosure is required. It isn't clear what a required level exit stairway is intended to be. The proposed exception clarifies the Section does not apply to levels below the point of exit discharge if enclosed with a 1 Hr. fire barrier.

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

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

ICCFILENAME: COLLINS-G5-403.5.2

G48–09/10

403.6.1, 3007.1, 3007.1.1 (New)

Proponent: Dave Frable, U.S. General Services Administration

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

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ two elevators having a minimum 3,500 pounds (1588 kilograms) capacity serving every floor within the subject building shall be provided to serve as a fire service access elevator ~~shall be provided~~ in accordance with Section 3007.

Exception: One elevator having a minimum capacity of 4,000 pounds (1814 kilograms) shall be permitted instead of 2 elevators of 3,500 pounds (1588 kilograms) capacity.

3007.1 General. Where required by Section 403.6.1, every floor of the building shall be served by ~~a~~ fire service access ~~elevator~~ elevators. Except as modified in ~~this section, the~~ Sections 3007.1 through 3007.7, fire service access ~~elevator~~ elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

3007.1.1 Ambulance stretcher. At least one fire service access elevator shall be sized to accommodate a stretcher in conformance with Section 3002.4.

Reason: Last Code Development Cycle, a code change was submitted to require a minimum of 3 fire service elevators. The subject proposal was disapproved by the Code Committee based on concerns that requiring a minimum of 3 fire service access elevators would have an adverse impact on a small footprint high-rise building and that requiring a minimum of 3 fire service access elevators seemed excessive. The intent of this code change is to provide a compromise that addresses the minimum number of fire service access elevators that are required in a building based on the size and capacity of the elevator and not strictly the number of elevators. The proposed text also allows for design flexibility as well as providing minimum requirements for the size and capacity of the fire service access elevators by correlating with Section 3002.4

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

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

ICCFILENAME: FRABLE-G6-403.6.1

G49–09/10
403.6.1

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

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

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ three fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007.

Reason: The proponents performed a survey of firefighters from across the country to explore the sufficiency of this current code requirement. Thirty-five responses were received from cities such as Charlotte, Orlando, San Francisco, Houston, Los Angeles, Fort Worth, Boston and Pittsburgh, all indicating that the number of elevators used for firefighting operations varies from 2 to 6. (Only one respondent, a suburban bedroom community indicated one elevator is sufficient for firefighting.) Firefighters experienced in high rise operations stated that the Fire Service must be able to count on **at least two** elevators at all times. They are necessary for 1) transporting firefighters to and from the staging area, usually located two floors below the fire floor; 2) moving firefighters to other floors for the purpose of search and rescue, fire extension, recon; hauling of equipment such as spare cylinders, exhaust fans, etc; and, 3) transporting those with disabilities to the building lobby.

Past experience during fires of this type (high-rise), is that on many occasions elevators are not available due to shut downs for various reasons, including problems in operation, routine maintenance, modernization programs, EMS operations in the building prior to firefighter arrival and other reasons. Without this change there will be a high chance that there will not be a Fire Service Access Elevator available for the firefighters' to perform their critical firefighting and life-saving rescue duties.

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

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

ICCFILENAME: BLACK-G5-403.6.1

G84–09/10
424 (New)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Add new text as follows:

SECTION 424
BUILDINGS REQUIRING A VULNERABILITY ASSESSMENT

424.1 General. In addition to the other requirements of this code, the following buildings and other structures shall have vulnerabilities assessed and mitigated in accordance with Sections 424.2 through 424.4.

1. Buildings more than 420 feet in building height.
2. Buildings and other structures containing Group A occupancies with an occupant load greater than 10,000.
3. Buildings and other structures with an occupant load greater than 20,000.

424.2 Vulnerability assessment. A vulnerability assessment shall be performed by an approved agency with expertise in vulnerability analysis, and a report shall be provided to the building official for review and approval by the authority having jurisdiction. The analysis shall conform to the generally accepted principles and industry practices for the buildings in Section 424.1. The analysis shall assess risks under intentional threats. Documentation of the analysis shall include scope of analysis, information sources, analytic calculations and methods, findings, referenced guidelines, and suggested mitigation methods. Following acceptance by the building official, the reports and documentation shall be returned to the building owner. Retention of these documents by the building official shall not be required.

424.3 Peer review. The building official is authorized to seek an independent peer review of the vulnerability analysis,

findings and proposed mitigation methods. The review shall be at the owner's expense. Upon completion, the reviewer shall submit a report to the building official, indicating the scope of the review performed and the findings of that review.

424.4 Mitigation. Risks identified in the vulnerability analysis shall be mitigated in an approved manner.

Reason: This proposal, if adopted, would add new text to the code for certain buildings of iconic classification. As the potential loads posed to these buildings by the threat of terrorist acts is generally non-quantifiable, normal design thresholds cannot be applied.

The ICC and the code community at large have been struggling since the tragic events of 9/11 to develop an appropriate response to the prospect of terrorism and terror-related events within the built environment. The ICC formulated an Ad Hoc Committee on Terrorism Resistant Buildings to deal with the issue, and assigned another standing committee, the Code Technology Committee, to review the National Institute of Standards and Technology's (NIST) Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers.

Throughout that process, it has become apparent that the model building and fire codes do contain some vulnerabilities that had not previously been anticipated, and the codes are currently being amended. Moreso, however, that process has made clear that the solution to terrorism prevention in vulnerable buildings and facilities lies not exclusively within the model codes, but rather in a deliberate, thorough vulnerability analysis of each iconic structure *individually*, with mitigation measures tailored to the level of threat determined by the analysis in each case.

This is not a new concept (References 1 to 9). The federal government has been conducting such analyses on select federal facilities for years now, as have a number of private developers of signature projects such as arenas, malls and super high-rise buildings. It is important to note that this provision does not change anything required of construction under the IBC, nor does it require that the building official become an expert in homeland security matters. A project developer of a new building under the very limited scope of this proposal --- 420 feet represents about 38 stories, or very large assembly arenas or super malls --- would simply have to engage an additional expert as part of their design team to conduct a vulnerability analysis. We would suggest to the membership that such a review is already being conducted now anyway in many cases, driven by the private sector.

It is anticipated that the building code official would engage a peer reviewer, one with the same or similar qualifications as the entity which completed the initial assessment analysis, at the owner's expense, to review the report and documentation and issue a response, ultimately resulting in consensus between the experts as to the risk and the appropriate mitigation measures to be taken during the project and post-occupancy.

The structural engineering community brought forth this proposal in Palm Springs, among other reasons because the load or threat to be considered and designed for in the realm of terrorism is not readily quantifiable, thereby making the solution impossible on a broad brush basis. We believe that a very limited, judicious approach to threat assessment and vulnerability analysis is the overall best response to the threat of terrorism.

Interested parties can find additional resources on this subject via the following links:

http://www.dhs.gov/index.shtm
http://www.tswg.gov/
http://www.fema.gov/pdf/plan/prevent/rms/155/e155_unit_iv.pdf
http://www.fema.gov/library/viewRecord.do?id=1939
http://www.fema.gov/plan/prevent/rms/rmsp452.shtm
http://www.fema.gov/rebuild/mat/index.shtm
http://www.fema.gov/about/regions/regionii/toolkit_risk.shtm

References:

1. FEMA 426, Reference manual to Mitigate Terrorist Attacks Against Buildings, http://www.fema.gov/plan/prevent/rms/rmsp426
2. FEMA 427, Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks, http://www.fema.gov/plan/prevent/rms/rmsp427
3. FEMA 459, Incremental Protection for Existing Commercial Buildings from Terrorist Attack, http://www.fema.gov/library/viewRecord.do?id=3270
4. Facilities Standards for the Public Building Service, http://www.gsa.gov/gsa/cm_attachments/GSA_DOCUMENT/p100-2003c8_R2E-qD-b_0Z5RDZ-i34K-pR.pdf
5. Homeland Security Centers of Excellence, http://www.dhs.gov/xres/programs/editorial_0498.shtm
6. Infrastructure and Geophysical Projects, http://www.dhs.gov/xres/programs/gc_1218480826191.shtm#9
7. FEMA 427, "Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks," http://www.fema.gov/plan/prevent/rms/rmsp427
8. Recommended Security Guidelines for Airport Planning, Design and Construction, http://www.tsa.gov/assets/pdf/airport_security_design_guidelines.pdf
9. USDOJ, A Method to Assess the Vulnerability of U.S. Chemical Facilities, http://www.fas.org/sgp/crs/RL32670.pdf

Cost Impact: The code change proposal will not increase the cost of construction. The Committee recognizes that the provision for additional expertise in the preliminary design stage will result in some additional expense; the requirement is, therefore, very targeted in scope and applies to a very small subset of structures in the built environment.

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

ICCFILENAME: LEWIS-G2-424.doc

G158–09/10

3007.2 (New), 3007.3 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.2 Automatic sprinkler system. The building shall be equipped throughout by an automatic sprinkler system in accordance with Section 903.3.1.1, except as otherwise permitted by Section 903.3.1.1.1 and as prohibited by Section 3007.2.1.

3007.2.1 Prohibited locations. Automatic sprinklers shall not be installed in elevator machine rooms, elevator machine spaces, and elevator hoistways of fire service access elevators.

3007.2.2 Sprinkler system monitoring. The sprinkler system shall have a sprinkler control valve supervisory switch and waterflow-initiating device provided for each floor that is monitored by the building's fire alarm system.

3007.3 Shunt trip. Means for elevator shutdown in accordance with Section 3006.5 shall not be installed on elevator systems used for fire service access elevators.

(Renumber subsequent sections)

Reason: 3007.2: The intent of this code change is to provide further clarification in meeting the original intent of Section 3007 regarding prohibiting the installation of automatic sprinklers in the associated elevator machine rooms and elevator machine spaces for fire service access elevators. . The subject proposed language is similar to the language in Section 3008.6 for occupant evacuation elevators.

3007.3: The intent of this code change is to provide further clarification in meeting the original intent of Section 3007 regarding prohibiting the installation of shunt trip for fire service access elevators. The subject proposed language is similar to the language in Section 3008.8 for occupant evacuation elevators.

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

Analysis: Would this requirement take precedence over Sections 403.2 and 903.2.11.3 which allow certain portions of a high-rise building not to be provided with sprinkler protection?

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

ICCFILENAME: FRABLE-G9-3007.2

G159–09/10
3007.2 (New)

Proponent: Dave Frable, U.S. General Services Administration

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

Add new text as follows:

3007.2 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each fire service access elevator or for each group of fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. In addition, actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby and elevator machine room smoke detectors.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire service access elevators. This code change will also ensure the subject elevators can be recalled quickly at the designated level by the responding firefighters.

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

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

G160–09/10
3007.2, 3007.2.1(New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

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

Revise as follows:

3007.2 Hoistway enclosures protection. The fire service access elevator <u>hoistway</u> shall be located in a shaft enclosure complying with Section 708.

<u>3007.2.1 Structural integrity of hoistway enclosures.</u> <u>The fire service access elevator hoistway shaft enclosure shall comply with Section 403.2.3.</u>

Reason: This proposed code change is a follow up to the Cal Chiefs Code Change G194-07/08 which was disapproved in Minneapolis.
That code change was disapproved mainly because it was based on a reference to the hose stream test in ASTM E119 for determining the structural integrity of the shaft enclosure. However, Code Change G65-07/08 by the Gypsum Association, which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures, was approved as modified in Minneapolis by Public Comment #2. That code change provided for another means for assessing the structural integrity of shaft enclosures, specifically for buildings known as super high-rise buildings (those greater than 420 ft in height). And it was supported by a NIST representative in response to one of the recommendations made in the NIST World Trade Center Report. Since it was approved for those conditions, it also seems appropriate that such structural integrity criteria should also be provided for the protection of fire service access elevator hoistways. These hoistways perform a very critical function protecting the responding fire fighters while the elevator assists them in gaining access to the fire floor in buildings generally more than 120 ft in height.

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

Analysis: Does the reference to Section 403.2.3 in the proposal result in requiring 'hardening' of the hoistway shaft at the 120 foot threshold for fire service access elevators or the 420 foot threshold provided in Section 403.2.3?

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

ICCFILENAME: THORNBERRY-G3-3007.2

G161–09/10
3007.3 (New)

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

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

Add new text as follows:

3007.3 Pressurization system. Hoistways for fire service access elevators and fire service access elevator lobbies required to be enclosed in accordance with 3007.4.2 shall be pressurized in accordance with Section 708.14.2.

(Renumber subsequent sections)

Reason: The Fire Service Access Elevators (FSAE) need to be protected from smoke entering either the hoistway directly or through the lobby or stair system that adjoins the FSAE. The current requirements for a Fire Service Access Elevator include elevator lobbies constructed as smoke barriers; however the Hazard Analysis done by the ASME Task Group on Use of Elevators by Firefighters determined that providing lobbies alone that are not pressurized is insufficient due to the likelihood that the lobby and stairwell doors would be open continuously to permit firefighting operations.

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

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

ICCFILENAME: BLACK-G7-3007.3.doc

G162–09/10
3007.4 (New)

Proponent: Dave Frable, U.S. General Services Administration

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

Add new text as follows:

3007.4 Water protection. An *approved* method to prevent water from infiltrating into the hoistway enclosure from the operation of the automatic sprinkler system outside the enclosed fire service access elevator lobby shall be provided.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide performance language that will permit alternate design options to provide a means to prevent water from an operating sprinkler system from infiltrating into the hoistway enclosure. For example, such approved means could include: drains, sloping floor, etc. The subject proposed language is similar to the proposed language in Section 3008.10 for occupant evacuation elevators.

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

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

ICCFILENAME: FRABLE-G10-3007.4

G163–09/10
3007.4.2

Proponent: Dave Frable, U.S. General Services Administration

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

Revise as follows:

3007.4.2 Lobby enclosure. The fire service access elevator lobby shall be enclosed with a *smoke barrier* having a minimum 1-hour *fire-resistance rating*, except that lobby doorways shall comply with Section 3007.4.3.

Exception: Enclosed fire service access elevator lobbies are not required at the levels of exit discharge ~~street floor~~.

Reason: The intent of this code change is to only replace the undefined term “street floor” with the defined term “level of exit discharge”. The subject text is similar to the wording in the requirement in Section 3008.11.2.

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

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

ICCFILENAME: FRABLE-G4-3007.4.2

G164–09/10
3007.5.1 (New)

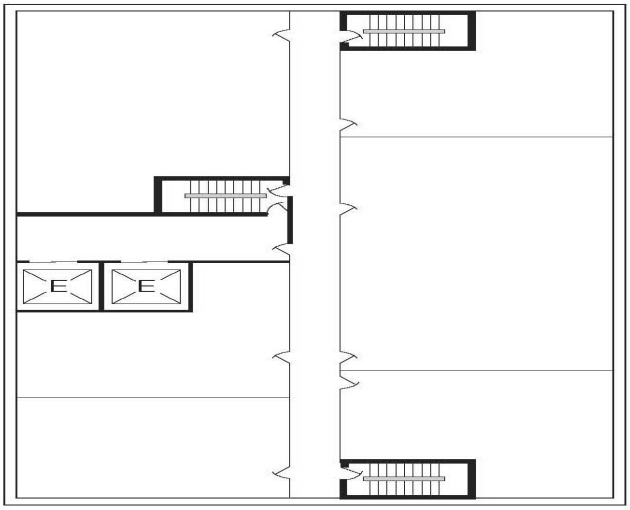
Proponent: Richard Bukowski, PE, FSFPE, Rolf Jensen & Associates, representing self

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

Add new text as follows:

3007.5.1 Access. The *exit enclosure* containing the standpipe shall have access to the floor without passing through the fire service access elevator lobby.

Reason: Access from the exit enclosure containing the standpipe to the floor is necessary so that the fire department can advance their attack hose onto the fire floor without opening the door between the lobby and the floor which could permit smoke contamination of the lobby and cause recall of the elevator(s). This access to the floor could be direct or through an access corridor or vestibule between the elevator lobby and the exit enclosure as long as there is a smoke barrier enclosing the elevator lobby.



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

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

ICCFILENAME: BUKOWSKI-G1-3007.5.1.doc

G165–09/10
3007.7.1, 3008.15.1

Proponent: Brian Black BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing, International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors Association of Greater New York (FSDAGNY)

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

Revise as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~1~~ 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~1~~ 2-hour fire resistance rating.

3008.15.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~1~~ 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~1~~ 2-hour fire resistance rating.

Reason: RE: 3007.7.1: The safety of firefighters during their firefighting operations is dependent upon the life safety support systems listed in Section 3007 being maintained during the critical first 2 hours of their efforts. Locating, surrounding, confining and extinguishing the fire, as well as removing those whose lives are in jeopardy, will take time. If the fire is not under control by 2 hours into the effort, then it is probably time to evacuate. Providing the 2 hour protection will provide the necessary safety factor for firefighters to undertake the firefighting and rescue operations without increased concern for system failure. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of the building.

RE: 3008.15.1: The safety of building occupants evacuating a building is dependent upon the life safety support systems listed in Section 3008 being maintained during the critical hours of evacuation. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of the building.

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

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

ICCFILENAME: BLACK-G8-10-3008.15.1.doc

G166–09/10
3007.7.1, 3008.15.1

Proponent: Brian Black BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing, International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors Association of Greater New York (FSDAGNY)

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

Revise as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire resistance rating.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

3008.15.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire resistance rating.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

Reason: The safety of building occupants evacuating a building is dependent upon the life safety support systems listed in Sections 3007 and 3008 being maintained during the critical hours of evacuation. Elevator landing fixtures that provide control signals such as hall call buttons and hall lanterns do not require a 1-hour fire resistance rating to ensure the viability of the system and protection of firefighters using the fire service access

elevator during Phase II operation. The industry generally does not submit fixtures for testing to obtain a fire-resistance rating.

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

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

ICCFILENAME: BLACK-G9-11-3007.7.1

G167–09/10
3007.8 (New)

Proponent: Dave Frable, U.S. General Services Administration

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

Add new text as follows:

3007.8 Fire service access elevator symbol. A pictorial symbol of a standardized design designating which elevators are fire service access elevators shall be installed on each side of the hoistway door frame on the portion of the frame at right angles to the fire service access elevator lobby. The fire service access elevator symbol shall be designed as shown in Figure 3007.8 and shall comply with the following:

1. The fire service access elevator symbol shall be a minimum of 3 inches (76 mm) in height.
2. The vertical center line of the fire service access elevator symbol shall be centered on the hoistway door frame. Each symbol shall not be less than 78 inches (1981 mm), and not more than 84 (2134 mm) inches above the finished floor at the threshold.

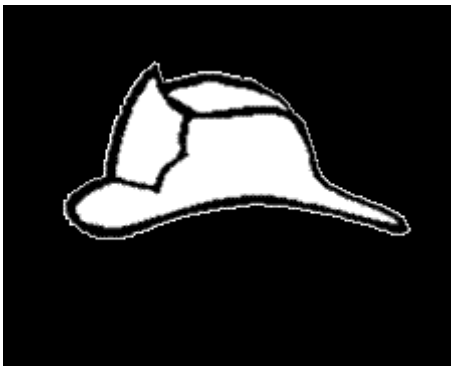


FIGURE 3007.8
FIRE SERVICE ACCESS ELEVATOR SYMBOL

Reason: The intent of this code change is to provide a means to designate which elevators in a building have been designated as fire service access elevators via a standardized pictorial symbol to be installed on each side of the door frame of each designated elevator. The subject symbol is based on the fire fighters hat referenced in ASME A17.1/CSA B44.

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

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

ICCFILENAME: FRABLE-G1-3007.8

G168–09/10
3008.1, 3008.3 (New)

Proponent: Matthew Davy, P.E., Schirmer Engineering Corporation, representing self

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

Add new text as follows:

3008.1 General. Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section. Where other elevators are used for occupant self-evacuation, they shall also comply with ~~this section.~~Sections 3008.1 through 3008.16.

3008.1.1 Alternative compliance. Where approved by the building official, occupant evacuation elevators shall comply with ASME A17.1/CSA B44 and shall be permitted to comply with standards alternative to Sections 3008.4 through 3008.16 provided such alternative standards are supported by an approved engineering analysis.

3008.2 Fire safety and evacuation plans. (No change to current text)

3008.3 Engineering analysis. An engineering analysis shall be conducted and approved for an occupant evacuation elevator.

3008.3.1 Analysis. The engineering analysis of the occupant evacuation elevator shall include a risk analysis, hazard analysis, or equivalent analysis. The analysis shall consider, as a minimum, the items indicated in Sections 3008.4 through 3008.16.

3008.3.2 Construction documents. The engineering analysis supporting the occupant evacuation elevators, their method of operation, systems supporting them, and methods of construction to be used shall accompany the submitted construction documents.

(Renumber subsequent sections)

Reason: An engineering analysis must be required for occupant evacuation elevator systems. These systems have many dynamic components and human interface aspects, which need to be reviewed, analyzed, and documented prior to acceptance by the code official or authority having jurisdiction. Occupant evacuation elevator systems are a life safety system that demands a rigorous analysis, such as a risk analysis or hazard analysis, for each building configuration and occupancy. The documentation requirement is consistent with the analysis for smoke control systems.

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

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

ICCFILENAME: DAVY-G1-3008.3

G169–09/10
3008.1.1 (New)

Proponent: Bill Ziegert, Smoke Guard, Inc.

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

Add new text as follows:

3008.1.1 Occupant evacuation elevators permitted. Occupant evacuation elevators shall be permitted only when the elevator code (ASME A17.1/CSA B44 or other) adopted by the jurisdiction contains specific requirements for the design, operation and maintenance of emergency evacuation operation (EEO).

Reason: Occupant Evacuation Elevators require many special operational / design requirements not found in the Building Code, and currently not included in any edition issued or under development of the ASME A17.1/CSA B44 Elevator Code. The proper operation and sequencing of the elevators to efficiently move occupants from the affected floors is the most important part of the occupant evacuation system and incorporation of this functionality currently allowed under the building code should not be allowed until the Elevator systems are designed with this additional functionality adequately addressed.

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

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

ICCFILENAME: ZIEGERT-G2-3008.1.1

G170–09/10
3008.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

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

Revise as follows:

3008.1 General. Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section. Where other elevators are used for occupant self-evacuation, they shall also comply with this section. Also see Section 1003.7.

Reason: This code change provides a simple cross-reference to Section 1003.7 Elevators, Escalators, and Moving Walks in order to make sure the user of the code realizes that elevators are not allowed to be used as a component of a required means of egress from any other part of the building. Currently, this new technology utilizing elevators for occupant self-evacuation is still in its infancy. It needs to be further assessed by the voluntary use of occupant elevators for evacuation without reducing the current requirements for means of egress until such time as they have been proven to be safe, reliable, and effective. Therefore, this cross-reference reminder is important for the proper application 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

ICCFILENAME: THORNBERRY-G4-3008.1

G171–09/10
3008.4 (New)

Proponent: Dave Frable, U.S. General Services Administration

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

Add new text as follows:

3008.4 Phase I Emergency recall operation. An independent, three-position, key-operated “Fire Recall” switch shall be provided at the designated level for each occupant evacuation elevator in accordance with the requirements in ASME A17.1/CSA B44.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire

service access elevators. This code change will also ensure the subject (as specific) elevators can be recalled quickly at the designated level by the responding firefighters.

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

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

ICCFILENAME: FRABLE-G8-3008.4

G172–09/10
3008.7 (New)

Proponent: Matthew Davy, P.E., Schirmer Engineering Corporation, representing self

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

Add new text as follows:

3008.7 Activation. Occupant evacuation elevator systems shall be activated by any of the following:

1. The operation an automatic sprinkler system complying with Section 3008.6;
2. Smoke detectors required by another provision of the code; or required as an alternative standard complying with Section 3008.1.1.
3. Approved manual controls.

(Renumber subsequent sections)

Reason: The current occupant evacuation elevator requirements do not contain a means for system activation. This new section provides a minimum set of initiating devices to activate the automatic operation. An example of smoke detectors required by another section of this code includes smokeproof enclosures for the mechanical ventilation or stair pressurization alternative. An engineering analysis should be required for occupant evacuation elevators that includes a section on system activation.

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

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

ICCFILENAME: DAVY-G2-3008.7

G173–09/10
3008.9, 3008.9.1 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

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

Revise as follows:

3008.9 Hoistway enclosure protection. ~~The~~ Occupant evacuation elevator~~s~~ hoistways shall be located in ~~a hoistway~~ shaft enclosure~~(s)~~ complying with Section 708.

3008.9.1 Structural integrity of hoistway enclosures. Occupant evacuation elevator hoistway shaft enclosures shall comply with Section 403.2.3.

Reason: This code change is a follow up to Code Change G65-07/08 by the Gypsum Association which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures in super high-rise buildings (those greater than 420 ft in height). It was approved as revised by Public Comment #2 at the ICC Final Action Hearings held in Minneapolis, MN.

In our opinion, it follows that the structural integrity requirements for super high-rise building exit stairway and elevator hoistway shaft enclosures should also apply to elevator hoistway shaft enclosures provided for occupant evacuation elevators which are just as critical for life safety protection. Such new technology for evacuation of occupants should be provided with the highest level of fire protection that is reasonably possible in order to assure that the elevators will be available during a fire emergency to serve their intended purpose of evacuating the occupants. Certainly,

the structural integrity of the elevator hoistway shaft enclosures should be required to have some reasonable degree of physical protection to assure that the hoistway shaft enclosures will remain in place when needed during a fire or other emergency.

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

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

ICCFILENAME: THORNBERRY-G5-3008.9

G174–09/10
3008.10

Proponent: Dave Frable, U.S. General Services Administration

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

Revise as follows:

3008.10 Water protection. ~~The occupant evacuation elevator hoistway shall be designed utilizing~~ An *approved* method to prevent water <u>from infiltrating into the hoistway enclosure</u> from the operation of the automatic sprinkler system ~~from infiltrating into the hoistway enclosure.~~ <u>outside the enclosed occupant evacuation elevator lobby shall be provided.</u>

Reason: The intent of this code change is to clarify the performance language in meeting the original intent of this section regarding providing a means to prevent water from an operating sprinkler system from infiltrating into the hoistway enclosure. The subject proposed language is similar to the proposed language in Section 3007.4 for fire service access elevators.

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

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

ICCFILENAME: FRABLE-G2-3008.10

G175–09/10
3008.10.1 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing the Smoke Safety Council

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

Revise as follows:

3008.10 Water protection. The occupant evacuation elevator hoistway shall be designed utilizing an approved method to prevent water from the operation of the automatic sprinkler system from infiltrating into the hoistway enclosure.

<u>3008.10.1. Water Intrusion.</u> <u>For elevators serving four or more stories in buildings equipped throughout with an automatic sprinkler system, hoistways and equipment shall be protected from the effects of water intrusion from openings into the hoistway. Protection shall comply with one of the following;</u>

1. <u>A 1 ½ inch raised threshold in front of the elevator opening with a slope of 2 percent or less;</u>
2. <u>Automatic dams or barriers that prevent the intrusion of water into the elevator shaft and are approved by the building official; or</u>
3. <u>Drains or grates across the elevator hoistway opening capable of removing water generated by a minimum of four fire sprinklers for the building.</u>

Reason: This is a revised proposal from last cycle which generated multiple discussions on the actual design of solutions indicating that there is a problem with water intrusion and there needs to be a definitive requirement in the code. Proposals by others also addressed this issue for the new classifications of elevators. The committee suggested an exception for buildings or elevators serving 3 or few levels and it is carried over with revised and more specific requirements.

Water intrusion into the elevator hoistway damages the electrical equipment that operates the elevator and potentially traps emergency personnel and occupants in the process of egressing.

This change recognizes three primary methods of protecting the opening. First, raising the threshold by 1.5 inches will direct the water to other lower areas of the floor. Setting the benchmark at 1.5 inches above the surrounding areas make a subtle rise in the floor possible while meeting the slope requirements found in Section 1010 while helping to direct water away from the opening.

Second, there are several commercially available automatic dams or barriers that can stop water intrusion. The qualifier that the AHJ must accept these systems that now have no definitive testing criteria allows for development of newer methods.

Third, the design of floor drains at the entrance to elevator hoistways is a viable method of controlling waterflow into buildings. The 4 sprinkler flow requirement is twice the expected flow based upon sprinkler operation data.

This change is submitted in three areas of Chapter 30-an overall general requirement or failing that then a requirement for newly established occupant evacuation elevators and fire service access elevators.

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

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

ICCFILENAME: CAHANIN-G1-3008.10.doc

G176–09/10
3007.4.3, 3008.11.3

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII)

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

Revise as follows:

3007.4.3 Lobby doorways. Other than the door to the hoistway, each doorway to a fire service access elevator lobby shall be provided with a ~~doorway that is protected with a~~ $^3/_4$-hour *fire door assembly* complying with Section 715.4. The *fire door assembly* shall also comply with the smoke and draft control door assembly requirements of Section 715.4.3.1 with the UL 1784 test conducted without the artificial bottom seal.

3008.11.3 Lobby doorways. Other than the door to the hoistway, each doorway to an occupant evacuation elevator lobby shall be provided with a ~~doorway that is protected with a~~ $^3/_4$-hour *fire door assembly* complying with Section 715.4. The fire door assembly shall also comply with the smoke and draft control assembly requirements of Section 715.4 3 1 with the UL 1784 test conducted without the artificial bottom seal.

Reason: The proposed new sentence to Section 3008.11.3 correlates with the lobby doorway requirements for fire service access elevators in Section 3007.4.3. The integrity and tenability of elevator lobbies used for occupant evacuation is just as critical as that provided for fire service access. The revision to the first sentence in both sections clarifies that the requirement for the rated doors applies to all doors into the lobby, except for the hoistway door. As currently written, the code could be interpreted to only require one door into the lobby to be a rated assembly, while any other door could be unrated.

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

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

ICCFILENAME: BLACK-G3-3008.11.3.doc

G177–09/10
3008.11.5, 1110.3

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

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

Revise as follows:

3008.11.5 Signage. An approved sign ~~indicating elevators are suitable for occupant self-evacuation~~ stating **PROTECTED ELEVATOR – USABLE IN EMERGENCIES** shall be posted on all floors adjacent to each elevator call station serving occupant evacuation elevators. Signage shall comply with visual character requirements in ICC A117.1 and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated.

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. through 6. (No change to current text)
7. At occupant evacuation elevators, signage shall be provided in accordance with Section 3008.11.5.

Reason: Exit signage should be consistent in all buildings that have protected elevators. 3008.11.5 requires such a sign but does not specify that wording for the sign. All required life safety signs that require words should clearly state the words, should be accessible in accordance with ICC A117.1, and should have illumination as required for exit signs. The proposed language is similar to 1007.9 for **AREA OF REFUGE** signs. The words **PROTECTED ELEVATOR – USABLE IN EMERGENCIES** is the same as recommended in the NFPA 101 Life Safety Code.

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

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

ICCFILENAME: MUNIZ-G1-3008.11.5

E1–09/10
1001.4 (New) (IFC [B] 1001.4 (New))

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Add new text as follows:

1001.4 Fire safety and evacuation plans: Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the *International Fire Code*. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the *International Fire Code*.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

This proposal is similar to E3-07/08 last cycle. However, based on fire service input, it has been expanded to include the reference to Section 401.2 of the IFC which states:

401.2 Approval. Where required by this code, fire safety plans, emergency procedures and employee traing programs shall be approved by the fire code official.

This added reference identifies the scope of responsibility of the evaluation of the plans.

The purpose of this code change proposal is to provide consistent requirements for jurisdictions regarding requirements for fire safety and evacuation plans. We feel fire safety and evacuation plans are important issues that impact occupant egress during an emergency and therefore meets the intent of the IBC and needs to be addressed. In addition, many jurisdictions across the country currently have adopted the IBC, however many of these same jurisdictions have not adopted the IFC. This reference will ensure that at least the fire safety and evacuation plans of the IFC are adopted by reference. Enforcement of the provisions is not an issue based on the reference to Section 401.2. The provisions are clearly within the scope of the IFC.

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

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

ICCFILENAME: Heilstedt-E2-1001.4

E131–09/10
1024.4 (IFC [B] 1024.4)

Proponent: Lee C. DeVito, PE, FIREPRO Incorporated, representing self

Revise as follows:

1024.4 (IFC [B] 1024.4) ~~Self-luminous and photoluminescent~~ Luminescent materials. Luminous egress path markings shall be permitted to be made of any material, including paint, ~~provided that an electrical charge is not required to maintain the required luminance~~. Such materials shall include, but are not limited to, self-luminous materials ~~and~~ photoluminescent materials and electroluminescent materials. Materials shall comply with either:

1. UL 1994; or
2. ASTM E 2072, except that the charging source shall be 1 foot-candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 millicandelas per square meter at 10 minutes and 5 millicandelas per square meter after 90 minutes.

Reason: Electrical systems provide the building management with more flexibility with the operation of the exit path marking systems.

Electrical systems do not need backup lighting which will allow building managers to control lighting. Furthermore, energy savings and Green/LEEDS requirements (for example thru the use of motion sensor lighting) may be further achieved with electroluminescent materials, as separate, continuously operational light sources are not required for charging purposes. A later section of this code, 1024.5 Illumination, requires means of egress illumination for photoluminscent exit path markings is required for at least 60 minutes prior to periods when the building is occupied. Electroluminescent exit path markings would not require this.

Electrical systems can be operated at any time as they have available power and they are protected with battery standby support. Therefore, the building management can utilize the electrical systems when ever there is an alarm activity or other situation in the building, whether the building power is available or not. Self luminous and photoluminescent materials only provide lighting when the background lighting is limited.

Electrical systems are supervised so the building management will know that there is a problem. Self-luminous materials and photoluminescent materials are not supervised, so they can be damaged or removed and no one is notified until a manual check is performed on the system. Whereas the systems are required in some high-rise buildings manual inspection will be time consuming and possibly burdensome, which may mean that self luminous or photoluminescent systems may not be inspected.

The building management can utilize the flexibility of electrical systems to provide further information on the availability or disruption of an egress path.

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

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

ICCFILENAME: Devito-E1-1024.4

S86-09/10
1609.1.1, 1609.1.1.2, Chapter 35

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

1. Revise as follows:

1609.1.1 Determination of wind loads: Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI 230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA/EIA-222 for antenna-supporting structures and antennas.
6. Wind tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.
7. Wind tunnel tests in accordance with ASCE/SEI 49, subject to the limitations in Section 1609.1.1.2.

1609.1.1.2 Wind tunnel test limitations. The lower limit on pressures for main wind-force-resisting systems and components and cladding shall be in accordance with Sections 1609.1.1.2.1 and 1609.1.1.2.2. The minimum design wind load shall not be less than the minimum prescribed in Chapter 6 of ASCE 7.

2. Add standard to Chapter 35 as follows:

American Society of Civil Engineers/Structural Engineering Institute
49-09 Wind Tunnel Testing for Buildings and Other Structures

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html Since its inception in April/2005, the CTC has held twelve meetings - all open to the public.

This proposed change is a follow-up to S81-07/08 which was a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes.

The reason this code change was not approved was due to the lack of completion/availability of the standard ASCE/SEI 49 entitled "Wind Tunnel Testing for Buildings and Other Structures". At the time this code change is submitted, the standard has gone through the requiste comment process and the standard is under appeal. As such, this proposal is submitted in anticipation of the standard being completed by the Final Action Hearings.

This proposal is intended to address NIST recommendation 2. For this specific proposed change, CTC is working in cooperation with the NIBS/MMC Committee to Translate the NIST World Trade Center Investigation Recommendations for the Model Codes. The CTC notes in their investigation that many of the recommendations contained in the NIST report require additional information for the CTC to further investigate. As such, CTC intends to continue to study the other NIST recommendations.

NIST Recommendation 2 recommends that nationally accepted performance standards be developed for: (1) conducting wind tunnel testing of prototype structures based on sound technical methods that result in repeatable and reproducible results among testing laboratories; and (2) estimating wind loads and their effects on tall buildings for use in design, based on wind tunnel testing data and directional wind speed data.

The IBC requires that wind loads be determined in accordance with Chapter 6 of ASCE 7, with specific exceptions depending on the size, configuration and location of the building. Section 6.1 of ASCE 7-05 provides three procedures to determine design wind loads: Method 1- Simplified Procedure; Method 2- Analytical Procedure; and Method 3- Wind Tunnel Procedure. Due to unique wind load considerations for certain building configurations and locations, Section 6.5.2 of ASCE 7 - 05 further mandates compliance with either the wind tunnel procedure of Section 6.6 of ASCE 7 or requires the design to be based on recognized literature documenting the wind load effects. Section 6.6 of ASCE does not currently prescribe specific wind tunnel test procedures. These are being developed by an ASCE Wind Tunnel Testing standard committee.

The purpose of this change is not to mandate wind tunnel testing in the IBC, but rather to achieve uniformity in results where the design involves wind tunnel testing – either as required by ASCE 7 or where the designer determines that wind tunnel testing is to be used to determine the wind loads.

The proposed revision that stipulates that the minimum design loads can not be less than the minimums of ASCE 7 (10 psf) is in response to the committees concern stated in the reason for disapproval of S16 -06/07. It is CTC's understanding that the standard will have been completed by the 2009 Baltimore Code Development Hearings.

References:
Interim Report No. 1 of the CTC, Area of Study – Review of NIST WTC Recommendations, March 9, 2006.
National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

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

Analysis: A review of the standard(s) proposed for inclusion in the code, ACSE49-09, 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 September 24, 2009.

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

FILENAME: HEILSTEDT-S1-1609.1.1

F23–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Joe McElvaney, Phoenix, AZ, representing self

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. ~~Status indicators and controls for air distribution systems~~.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: The IFC and IBC have smoke and fire dampers, smoke detection for the air distribution systems, automatic fire sprinkler system throughout. All these reduce and/or limit the travel of smoke. Today energy management system /computers that are used on air distribution system, turn on or off air distribution system items (i.e. fans, damper) If some that do not have knowledge of the air distribution system and start to turn on/off fan or open/close damper one can cause major damage to the air handling units and duct. If the goal of this item is to be used after a fire (to move smoke form one area to another area and to limit damage) then this can be done with energy management system with the help of the building engineer. Additional panel is not need. If the building has a smoke control system then a panel with be still require by item 6 of this section

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

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

ICCFILENAME: MCELVANEY-F1-508.1.5.DOC

F24–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Joe McElvaney, Phoenix, AZ, representing self

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. ~~Fire pump status indicators.~~
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: The current IFC and NFPA 20 do not have a list of items that shall have their status indicated. NFPA 72 does have a section that lists items that should be monitored where required by another code. If an alarm system is installed and the fire pump is monitored per NFPA 72 via the fire alarm panel, there is no need to have another panel on the wall that has the fire pump status. The fire alarm system can do all of this. Also, Section 508 does not tell us what type of fire pump status we need to have monitored.

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

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

ICCFILENAME: MCELVANEY-F2-508.1.5-2.DOC

F25–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features.

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighters control panel required by Section 909.16 for smoke control systems installed in the building.

7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans, including a Building Information Card approved by the fire department, which shall provide building statistics including address, height, width and type of construction; stairway access, designation, floors served, pressurization, standpipe availability; elevators bank designation, car numbers, and floors served; ventilation details, including HVAC zones, location of mechanical equipment rooms, and offsite emergency phone numbers; utilities, fuel oil tank locations, gas service locations, electrical service locations; fire protection systems details, including standpipe locations, valve locations, pump room locations; hazardous materials and locations; and, contact phone numbers for building engineers, managers and fire safety directors. The Building Information Card shall also indicate ~~indicating~~ the typical floor plan and detailing the building core, means of egress, fire protection systems, elevator locations, firefighting equipment and fire department access and the location fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: This proposal is a revised follow-up to a similar proposal defeated last cycle. It is part of a package of submittals generated by the ICC's Ad Hoc Committee on Terrorism-Resistant Buildings. The proposal seeks to slightly modify and revise an existing provision of the IBC and a parallel provision in the IFC related to fire command centers in high-rise buildings.

The scope of the proposal has been reduced to simply codifying Item #12 of the list of required fire department support features in the center. There is a need to provide complete, yet concise information to the responding fire service to assist in assessment and management of the rescue and fire fighting efforts.

The Final Report on the Collapse of the World Trade Center contained 30 key recommendations compiled by the National Institute of Standards and Technology designed to address the building vulnerabilities learned in that tragedy. Three of those thirty recommendations (Items #15, 23 and 24) embrace increasing situational awareness and emergency communications of first responders in large-scale emergencies. In fact, the command center was recently doubled in size, and now also contains additional elevator control switching, a relatively new enhancement.

The proposed Building Information Card in #12, as utilized by the NYFD, puts critical response information in a user-friendly format and medium. A simulation of the Building Information Card used in New York City follows:

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The Ad Hoc Committee anticipates no additional cost to construction resulting from this proposal as the bulk of this information must already be provided based on the current code.

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

ICCFILENAME: LEWIS-F1-508.1.5.DOC

F27–09/10
510, 502.1, Appendix J, 105.7.12 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Revise as follows:

SECTION 510
EMERGENCY RESPONDER RADIO COVERAGE

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the *building code official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved*

radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

~~**510.3**~~ **510.2 Emergency responder radio coverage in existing buildings**. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

~~**J101.2**~~ **510.3 Permit required.** A construction permit ~~is required~~ for installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.12. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.4 Technical requirements. Systems, components, and equipment required to provide emergency responder radio coverage system shall comply with Sections 511.4.1 through 511.4.2.5.

~~**510.2**~~ **510.4.1 Radio signal strength.** The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections ~~510.2.1~~ 510.4.1.1 and ~~510.2.2~~ 510.4.1.2.

~~**510.2.1**~~ **510.4.1.1 Minimum signal strength into the building**. A minimum signal strength of -95 dBm shall be receivable within the building.

~~**510.2.2**~~ **510.4.1.2 Minimum signal strength out of the building**. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

~~**J103.1**~~ **510.4.2 System design.** The emergency responder radio coverage system shall be designed in accordance with Sections ~~510.3.2.1~~ 510.4.2.1 through ~~510.3.2.5~~ 510.4.2.5.

~~**J103.1.1**~~ **510.4.2.1 Amplification systems allowed.** Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters, or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.

~~**J103.1.2**~~ **510.4.2.2 Technical criteria.** The *fire code official* shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

~~**J103.1.3**~~ **510.4.2.3 Secondary power.** Emergency responder radio coverage systems shall be provided with an *approved* secondary source of power. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least 12 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.

~~**J103.1.4**~~ **510.4.2.4 Signal booster requirements.** If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type water proof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA4-type water proof cabinet.
3. The ~~system shall include automatic alarming of malfunctions of the~~ signal booster system and battery system~~. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72~~ shall be electrically supervised and monitored by a supervisory service, or when approved by the *fire code official*, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC Certification prior to installation.

~~**J103.1.5**~~ **510.4.2.5 Additional frequencies and change of frequencies.** The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or

additional frequencies are made available by the FCC.

~~**J103.2**~~ **510.5 Installation requirements.** The installation of the public safety radio coverage system shall be in accordance with Sections ~~J103.2.1~~ 510.5.1 through ~~J103.2.5~~ 510.5.5.

~~**J103.2.1**~~ **510.5.1 Approval prior to installation**. No amplification system capable of operating on frequencies licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the *fire code official*.

~~**J103.2.3**~~ **510.5.3 Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead installation personnel shall include:

1. A Valid FCC issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

The agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

~~**J103.2.4**~~ **510.5.4 Acceptance test procedure**. When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
3. A maximum of two nonadjacent areas will be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas will be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.
5. A test location approximately in the center of each grid area will be selected for the test, then the radio will be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area will not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test will be conducted at time of installation and subsequent annual inspections.

~~**J103.2.5**~~ **510.5.5 FCC compliance.** The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations, including but not limited to, FCC 47 CFR 90.219.

~~**J103.3**~~ **510.6 Maintenance.** The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections ~~510.5.1~~ 510.6.1 through ~~510.5.3~~ 510.6.3.

~~**J103.3.1 Maintenance.** The public radio coverage system shall be maintained operational at all times.~~

~~**J103.3.2 Permit required.** A construction permit, as required by Section 105.7.5 of the *International Fire* Code, shall be obtained prior to the modification or alteration of the emergency responder radio coverage system.~~

~~**J103.3.3**~~ **510.6.1 Testing and proof of compliance**. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section ~~J103.2.4~~ 510.5.4.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.

3. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing a report which shall verify compliance with Section ~~J103.3.4~~ 510.5.4 be submitted to the *fire code official*.

~~**J103.3.4**~~ **510.6.2 Additional frequencies.** The building *owner* shall modify or expand the emergency responder radio coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

~~**J103.3.5**~~ **510.6.3 Field testing.** Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field-testing to verify the required level of radio coverage.

~~**J102.1 Definitions.** For the purpose of this appendix, certain terms are defined as follows:~~

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.

AGENCY. Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement.

2. Add new text as follows:

105.7.12 Radio coverage system. A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

(Renumber subsequent sections)

3. Delete Appendix J without substitution:

~~**APPENDIX J**~~
~~**EMERGENCY RESPONDER RADIO COVERAGE**~~

Reason: This proposal takes the requirements for emergency responder radio coverage made last code cycle and finishes the process. Appendix J was included in the 2009 edition and contains the installation and testing criteria for the emergency responder radio coverage system. In this proposal, the entire appendix is relocated into the code. This action is the result of a request by the Code Development Committee last cycle and can be seen in their Reason Statement in Report on Hearings.

As the appendix is relocated into the code, some minor clarifications occurred. The following revisions are made:

1. 510.1 – the term "new" is included to clarify the difference between Section 510.1 (new construction) and 510.2 (existing construction)
2. 510.3 – this section has been relocated and includes three sections from the appendix which dealt with permits. Sections J101.2, J103.2.2 and J103.3.2 all referenced permits. This revision will provide a single section which covers permits for these systems.
3. 105.7.12 – this permit requirement is added to Chapter 1. Since the appendix is deleted, the permit requirement also needs to be located within the code. This is editorial.
4. 510.4.2.4 – Item 3 is revised to correlate with the new wording used in other sections of the code when referencing monitoring of systems. 510.6 – The two sections from the Appendix J103.3 and J103.3.1 have been combined into one section for simplicity.

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

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

ICCFILENAME: LARIVIERE-F33-510.DOC

F28–09/10
510.1, 510.3, 510.4 (New), 510.5 (New), 502.1; Appendix J103.2.3, J103.2.4

Proponent: A. Keith Brown, North Metro Fire Rescue District, representing Fire Marshal's Association of Colorado

1. Revise as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with FCC certified signal boosters, or other system *approved* by the fire code official in order to achieve the required radio coverage. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. ~~Where it is determined by the *fire code official* that the radio coverage system is not needed.~~ One- and two-family dwellings.

510.3 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Wherever existing wired communication system cannot be repaired or is being replaced, or where not a*pproved* in accordance with Section 510.1, Exception 1.
2. Within a time frame established by the adopting authority.

Exception: One- and two-family dwellings.

2. Add new text as follows:

510.4 Inspection, testing and maintenance. Emergency responder radio communication systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective or degraded.

510.4.1 Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions, alterations, or remodels that could materially change the original field performance tests. At the conclusion of the testing, a report verifying compliance with Sections 510.4.2 and 510.4.3, as applicable, shall be submitted to the *fire code official*.

510.4.2 Annual tests. Within one year of issuance of the certificate of occupancy, and annually thereafter, the building owner of any building for which an emergency responder communication radio system is installed shall test all active components of the system, including, but not limited to, amplifiers, power supplies, supervisory signals and backup batteries. Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies shall be tested under load for a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period, in the opinion of the testing technician, the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the testing technician confirms the integrity of the battery. All other active components shall be checked to determine that they are operating within the manufacturer's specifications for the intended purpose. If the communications appear to have degraded or if the tests fail to demonstrate adequate system performance, the owner of the building or structure is required to remedy the problem and restore the system in a manner consistent with the original approval criteria.

510.4.3 Five year tests. In addition to the annual test, the building owner shall perform a radio coverage test a minimum of once every five years to ensure that the radio system continues to meet the requirements of the original acceptance test. The procedure set forth in 510.4.2 shall apply to such tests.

510.4.4 Field testing by emergency response agencies. Emergency response agencies are authorized to conduct annual tests on all systems. If communications appear to have degraded or if the tests fail to demonstrate adequate system performance the owner of the building or structure shall remedy the problem and restore the system in a manner consistent with the original approval criteria.

510.4.5 Degradation due to building, additions, remodels or alterations. If the degradation to the system is due to building additions, remodels or alterations, the owner of the building or structure shall remedy the problem and restore the system in a manner consistent with the original approval criteria in order to obtain a final inspection for occupancy.

510.4.6 Degradation due to system failure. Any system degradation or failure not related to the performance of the owner's on site system shall be the responsibility of the appropriate emergency service agency.

510.4.7 Qualifications of testing personnel. All annual and five year tests shall be conducted, documented, and signed by a person in possession of a current FCC license, or a current technician certification issued by the Associated Public Safety Communications Officials - International or the Personal Communications Industry Association. All test records shall be retained on the inspected premises by the building owner and a copy submitted to the *fire code official*.

510.5 Additional frequencies. The building owner shall modify or expand the emergency responder radio coverage system, at no expense to the emergency response agency, in the event frequency changes are required by the FCC, additional frequencies are made available by the FCC, or frequency changes are initiated by the emergency response agency. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

3. Revise as follows:

502.1 ~~J102.1~~ 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.

EMERGENCY RESPONSE AGENCY. Any of various public safety agencies such as fire departments, emergency medical services and law enforcement ~~emergency responder department~~ within the jurisdiction that utilizes radio frequencies for communication. ~~This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement~~.

510.2.2 Minimum signal strength out of the building. A minimum signal strength of -100 dBm shall be received by the emergency response agency's radio system when transmitted from within the building.

J103.2.3 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include:

1. A valid FCC-issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization or school or a certificate issued by the manufacturer of the equipment being installed.

The emergency response agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

J103.2.4 Acceptance test procedure. When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the emergency response agency talking through the emergency response agency's radio communications system.
3. A maximum of two nonadjacent areas shall be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be

divided into 40 equal areas. A maximum of four nonadjacent areas shall be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90-percent coverage requirement.

5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications to and from the outside of the building through the ~~public~~ emergency response agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at time of installation and subsequent annual inspections.

4. Delete without substitution:

~~J103.1.1 Amplification systems allowed.~~
~~J103.3 Maintenance.~~

Reason: The purposes of the proposed code change are:
Item 1:

1. Clarify that Section 510.1 does not require the addition of a radio-coverage system where approved radio coverage exists;
2. Delete the existing Section 510.1 Exception 2 that allows a vital requirement to be eliminated for any arbitrary and capricious reason and without providing an equivalent level of safety for emergency responders;
3. Except one- and two-family dwellings from all requirements of Section 510;
4. Ensure the continuing operability of radio coverage systems, where required, even in the event of frequency changes;
5. Establish documentation requirements for inspection and testing of radio coverage systems.

The existing, charging language of Section 510.1 implies, or could easily be construed to require, that some sort of public-safety radio-amplification system is required in all new buildings regardless of existing signal strengths, especially when Exception 1 (referencing an in-building communication system) is considered. The proposed language, which inserts Section J103.1.1, makes clear that Section 510.1 applies only to buildings and structures that do not already support the required level of radio coverage. Where acceptable emergency responder radio coverage is lacking, the new language (again from J103.1.1) identifies the allowable amplification systems that may be used to achieve required radio coverage.

The existing Exception 2 of Section 510.1 may be unique in the IFC in that no criteria or logical nexus is stated or implied to provide a reasonable basis for eliminating radio coverage for emergency responders, a fire service feature vital to firefighter safety. If Exception 2 was intended to mean that a radio coverage system is not needed when a building is shown to support acceptable radio coverage without such a system, then the language used is, at best, imprecise and, at worst, outrageously broad so as to violate the long-established principles of equivalent effectiveness elucidated in IFC Sections 104.8 and 104.9

The proposed exceptions to Section 510.1 and 510.3 for one- and two-family dwellings constructed under the IBC (e.g., where the IRC is not adopted) are intended simply to clarify that radio coverage systems will not be required in such buildings, thus preventing potential overzealous application of Section 510. Note that the proposed language references "dwellings," the definition of which (IFC Chapter 2) explicitly excludes townhouses as well as condominium/apartment buildings containing more than two dwelling units. Thus, even though each condominium in a Group R-2 high rise may itself be a single dwelling unit, the proposed exceptions for one- and two-family dwellings would not preclude requiring a radio-coverage system in said high rise. Because IFC Section 105.7 does not presently require a permit for the installation or modification of emergency responder radio coverage systems, dwellings constructed pursuant to the IRC are not impacted by the proposed change, per IFC Section 102.5 Item 1.

Item 2: The proposed Section 510.4 provides requirements for on-going maintenance and recurring testing of installed radio-coverage systems, similar to inspection, testing, and maintenance requirements for other systems (see IFC Sections 901.6, 604.3, 2703.2.6, et al.). Section 510 in the 2009 IFC lacks any such explicit requirements. Absent local adoption of Appendix J, assurance of dependable radio coverage necessary for the safety of emergency responders would appear to rest wholly on the general provisions of IFC Sections 106 and 107, which sections prescribe neither the frequency of testing (see Section 107.2) nor the qualifications of personnel competent to execute the highly technical testing of radio-amplification systems.

Section 510.5, as proposed, both mandates that radio coverage systems be upgraded as needed to accommodate frequency changes and makes such upgrades the responsibility of the building owner. The proposed language stems from Section J103.3.4.

Item 3: The purpose of this portion of the proposed code change is to define and clarify in the body of the code a foundational term used within the context of IFC Section 510 and Appendix J - Emergency Responder Radio Coverage. The proposed text stems from the definition contained in IFC Section J102.1.

Item 4: The content of the noted appendix sections was moved into Section 510. Deletion of those appendix sections eliminates the potential for conflicts between Section 510 and Appendix J.

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

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

ICCFILENAME: BROWN-F2- 510.1~REVISED.DOC

F29–09/10
510.1

Proponent: Ronald Marts, Telecordia, Qwest Communications, AT&T

Revise as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In telecommunications buildings, where emergency responder radio coverage is required and such systems, components or equipment required may have a negative impact of radio frequency interference (RFI) on local, regional and/or national telecommunications functions of the facility, it shall be permitted to provide a function switch for the activation of the internal emergency responder radio system. The location of the function switch shall be approved by the fire code official.

Reason: This specific activation of the facilities internal emergency responder radio system will limit potential inference with the vital telecommunications operations of the facility to 24/7 exposure to these signals. The potential for interference with the operations of the telecommunications facility operations is unique to each space and operation of the facility and places in direct risk emergency services, national security and defense, and other critical telecommunications functions of the facility.

To date, studies have suggested that RFI from these transmitters may affect telecommunications equipment and thus telecommunications service.

Cost Impact: The code change proposal will have a small impact on construction cost

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

ICCFILENAME: MARTS-F1-510.1.DOC