ICC CODE TECHNOLOGY COMMITTEE

DRAFT REVIEW OF FINDINGS ON THE NIST WORLD TRADE CENTER REPORT

January 30, 2006

In September/2005, the ICC Board assigned the Code Technology Committee (CTC) with an area of study entitled "Review of NIST WTC Recommendations". This review includes a review of the *Final Report on the Collapse of the World Trade Center Towers* by NIST. Included here is a draft of their findings. It should be noted that these findings do not address all the NIST recommendations but rather focuses on those determined by the CTC to be recommendations for possible consideration in the upcoming ICC 2006/2007 Code Development Cycle.

The findings of the CTC will be reviewed at the upcoming meeting of the CTC on February 2-3, 2006 at the Crowne Plaza Orlando Airport in Orlando, Florida [(407) 856-0100]. For more information on the activities of the TRB and CTC, see ICC's website at: www.iccsafe.org/cs/cc

The findings are subject to change at the CTC meeting. The findings are keyed to the recommendations included in Chapter 9 of the Final Report issued in September/2005 and, for some of the recommendations, are presented in ICC conventional code change language to the *International Building Code* (note code sections subject to change). The CTC findings are indicated on the pages noted below:

The CTC Task Groups noted in these findings are as follows:

CTC Task Group	NIST Recommendations
Structural	#1, #2, #3
Passive Fire Protection	#4, #5, #6, #7, #8, #9, #10, #11
Active Fire Protection	#12, #13, #14, #15, #26 (two task groups)
Egress	#16, #17, #18, #19, #20, #21, #26
Emergency Communications	#22, #23, #24
Administrative	#25, #26, #27, #28, #29, #30

NIST Recommendation #2
Wind tunnel testing
CTC Task Group: Structural

Recommendation:

1. Not moving forward at this time in recommending a Building Standard for conducting wind tunnel testing that result in repeatable and reproducible results among the testing facilities. The main reason for disapproval is that ASCE's wind tunnel test standard is not adopted yet and is presently in the public comment stage. Because this ASCE standard is addressing parameters of the test itself, more input is needed from the design community regarding a building's physical characteristics, such as building height, the height to width ratio, and a building's fundamental frequency which characterizes it as a dynamically sensitive structure.
2. A second reason for not recommending anything at this time into the IBC regarding wind tunnel testing for specific buildings is that the ACI is presently looking at performance based wind designs on concrete structures. That committee (Committee 375) is headed by Joe Bracci of the Texas A&M University, and to date has nothing to document on this topic. Because of these reasons I would recommend looking at this NIST recommendation at a future date.

NIST RECOMMENDATION #3
Tall building sway criteria
CTC Task Group: Structural

Recommendation:

No action at this time. The justification for limiting lateral deflection in non-seismic areas under lateral load design conditions is not clear. The life safety threats and current design methods needing this “complimentary” consideration should be identified. This seems to be a consideration which is practiced although not mandated by a code. The need for such a provision needs to be addressed by the standards community.

NIST RECOMMENDATION #7
Fire rating of structural frame
CTC Task Group: Passive Fire Protection

1. Add a definition to Section 202 to read as follows:

PRIMARY STRUCTURAL FRAME. Those structural members in a building that transfer gravity loads to the building's foundation (See Section 714.1.1).

2. Revise line 1, column 1 of Table 601 and delete Footnote a to Table 601 as follows:

Primary ~~Structural~~ structural frame[a] ~~Including columns, girders, trusses~~ See Section 714.1.1.

~~Footnote a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not part of the structural frame.~~

3. Revise Section 714.1 714.2, 714.2.1 and 714.2.2 as follows:

714.1 Requirements. The fire-resistance rating of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601 and shall be not less than the rating required for the fire-resistance-rated assemblies supported by the structural members.

Exception: (No change.)

714.1.1 ~~714.2~~ ~~Protection of~~ Primary structural frame ~~members~~. ~~Protection of columns, girders, trusses, beams, lintels or other structural members that are required to have a fire-resistance rating shall comply with this section.~~ The primary structural frame shall be the columns and other structural members including the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads.

714.1.2 Secondary members. The members of floor or roof construction which are not connected to the columns shall be considered secondary members and not part of the primary structural frame.

714.2~~.1~~ Individual encasement protection. ~~Columns, g~~Girders, trusses, beams, lintels, or other structural members that are required to have a fire-resistance rating and that support more than two floors or one floor and roof, or support a load-bearing wall or a non-load bearing wall more than two stories high, shall be individually protected on all sides for the full length, including connections to other structural members, with materials having the required fire-resistance rating.

714.2.1 Alternative protection. The structural members that are required to have a fire-resistance rating and are not required to be provided individual encasement protection according to Section 714.2 ~~Other structural members required to have a fire-resistance rating~~ shall be protected by individual encasement protection, by a membrane or ceiling protection as specified in Section 711, or by a combination of both. ~~Columns shall also comply with Section 714.2.2.~~

714.2.2 Column protection ~~above ceilings~~. Where columns are required ~~a~~ to be fire-resistance rated ~~rating~~, the entire column, including its connections to beams or girders, shall be provided individual encasement protection ~~protected~~ on all sides for the full column length. Where the column extends through a ceiling, the fire-resistance rating of the column shall be continuous from the top of the floor through the ceiling space to the top of the column.

Reasons: In September 2005, the ICC Board of Directors assigned an Area of Study and Investigation to the Code Technology Committee (CTC) which included the review of the NIST WTC Recommendations as contained in the since released Final Report on the Collapse of the World Trade Center Towers (NIST NCSTAR 1). In performing this work the CTC is coordinating their work with the ICC Ad Hoc Committee on Terrorism Resistant Buildings and cooperating with the NIBS/MMC Committee to Translate the NIST World Trade Center Investigation Recommendations for the Model Codes.

This proposal is intended to address the NIST Recommendation #7 which is summarized as "NIST recommends the adoption and use of the structural frame approach to fire resistance ratings." While the IBC currently contains this approach, the NIST team recommends that the concept be reinforced by incorporating text similar to that contained in Footnote a to Table 601 into the pertinent code text for a higher visibility and understanding by code users.

1. The proposed definition is fundamentally based on text suggested by the NIST team in conjunction with the NIST Recommendation #1 which is as follows:

PRIMARY STRUCTURAL MEMBERS. Those members in a building that transfer gravity and lateral loads over the height of a building (i.e. story to story) to the building's foundation.

The defined term was revised to more closely resemble the current terminology in line 1 of Table 601 which is "structural frame". Also the consideration of "lateral loads" was removed as inconsistent with current IBC intent. Finally, the text "over the height of a building (i.e, story to story)" was removed as unnecessary to define the term and perhaps confusing. It should be noted that that the NIST Recommendation #1 deals with progressive collapse and is not an issue which this proposal addresses. The intent in utilizing that definition as modified above is simply to reinforce a concept. Also note that the currently IBC utilizes "secondary members" in Footnote a to Table 601.

2. The proposed modification to line 1, column 1 of Table 601 is not intended to revise the intent but to incorporate the term defined in item 1 above. The laundry list of examples is limited and

reliance on the footnote and code text enables a better understanding of the requirements for the pertinent building elements.

Likewise, the modification to Footnote a is intended to retain the current intent. The incorporation of "other structural members" is to place reliance on the function of the member to determine its inclusion in the primary structural frame although a laundry list of commonly understood members is retained for understanding of the intent. The assemblies for floors and roofs are not consistently referred to as "panels" and the apparent intent is to deal with "floor and roof construction".

3. The modifications to the several subsections of Section 714 are intended to utilize the definition above and consolidate text into a more efficient format without a change in intent.

714.1 – The section is revised by incorporating the requirement that the fire-resistance rating of structural members is to comply with "this section" and "Table 601".

714.1.1 – Existing section 714.2 is not necessary and contains no particular requirements which are not contained in Section 714.1. The structural members named in the existing laundry list are included in the subsections which apply to such members. The proposed Section 714.1.1 is based on the first sentence of existing Footnote a to Table 601.

714.1.2 – This text is based on the second sentence of existing Footnote a to Table 601.

714.2 – The proposal utilizes the text and concept contained in existing Section 714.2.1. The inclusion of "encasement" in the section title is to enhance the focus of the section's intent. The proposed deletion of "columns" from the laundry list is to eliminate the implication that columns are not required to be individually protected to their full height when protected by Section 711 - Horizontal Assemblies. Individual protection for columns is required by existing Section 714.2.2. This is addressed in proposed Section 714.2.2. The connections of these elements to other structural members are required to be protected for the continuity of protection.

714.2.1 – The proposal is based on the text in the second sentence of the existing Section 714.2.1 and is addressing those structural members which are not required to be individually protected according to proposed Section 714.2. The last sentence of existing Section 714.2.1 is not needed as proposed Section 714.2.2 exclusively deals with columns.

714.2.2 – The proposal requires columns to be individually protected for the full column length and columns are not permitted to be protected by membrane protection.

Recommendation 12: Enhanced performance and reliability of active systems
CTC Task Group: Active Fire Protection

Regarding NIST Recommendation 12. NIST recommends that the performance and redundancy of active fire protection systems (sprinklers, standpipes/hoses, fire alarms, and smoke management systems) in buildings be enhanced to accommodate the greater risks associated with increasing building height and population, increased use of open spaces, high-risk building activities, fire department response limits, transient fuel loads, and higher threat profile.

Dec CTC Minutes:
Discussion: This item is related to the Balanced Fire Protection area of study.

NIST Strawman: Relative to secondary water supply, this is not the only potential solution. There are
alternatives and all must be examined in the context of balanced fire protection.

Outcome: CTC to evaluate with-in the context of Balance Fire Protection.

Time frame: Long term

PROPOSED CODE CHANGE:

Modify IBC and IFC Sec. 903.2 as follows:

903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in this section.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, and batteries ~~and standby engines~~, provided those spaces or areas are equipped throughout with an automatic fire alarm system and are separated from the remainder of the building by a wall with a fire resistance rating of not less than 1 hour and floor/ceiling assembly with fire-resistance rating of not less than 2 hours.

Purpose of change: The purpose of this proposal is to increase the protection provided by sprinklers in building spaces that are currently exempt in the codes (e.g., spaces containing standby generators) and that are susceptible to a failure mode that could produce an intense fire. It is proposed (1) that the specific exceptions to requirements for automatic sprinklers as described in the International Fire Code and International Building Code, Section 903.2 , be deleted.

Reason for change: There are only three reasons why a space should not or need not be sprinklered: the application of water would constitute a serious life or fire hazard; the room construction and its contents are wholly noncombustible; or an alternative automatic fire-extinguishing system as described in Section 904 provides a more effective/economic design solution. All three of these options are adequately covered even with the proposed deletions.

Cost Impact: There is a cost impact of this proposal, related to the fraction of all building spaces that are normally exempt under the provisions that have been deleted.

Analysis: Investigate whether or not any NFPA standards committees (i.e., 13, 72 or the high rise committee) are conducting a review of these items relative to the NIST WTC report. Review latest NFPA sprinkler reliability report to determine if conclusions can be drawn as to the reliability based on the occupancy (i.e., assembly, business, storage) and building type (single story vs multi story).

Task Group Comments: My understanding of the current data from NFPA on the performance of sprinklers is that these systems perform at a very high in all these circumstances. The implication by NIST that there is no cost impact is totally incorrect. Adding the secondary water supply in seismic design categories C, D, E and F was done based on significant data regarding losses and the potential hazard associated with sprinklered structures in these design categories. I do not find any justification for the change in the information provided by NIST nor any information in the NIST investigation of the WTC that indicates that the presence of a secondary water supply would have made any difference in that event. To place an additional burden on the public by requiring additional levels of protection for a potential hazard that is totally unknown seems irrational to me.

NFPA's high rise committee is an advisory committee whose recommendations would be processed through the code development process which will not be initiated until later this year. I have reviewed the current NFPA 13 and 72 changes and do not find any changes that address this subject.

NIST PROPOSED CODE CHANGE:

Modify IBC Sec. 903.3.5.2 as follows:

903.3.5.2 Secondary water supply. A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise building ~~in Seismic Design Category C, D, E, or F as determined by this code~~. The secondary water supply shall have a duration not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

Purpose of change: The purpose of this proposal is to increase the protection provided by sprinklers in portions of high rise buildings that do not rely upon a fail-safe gravity (or equivalent) secondary water supply. Paragraph 903.3.5.2, Secondary Water Supply, of the International Fire Code and International Building Code should be modified by deleting the following phrase from the first sentence: "...in Seismic Design Category C, D, E or F as determined by this code."

Reason for change: There are a number of possible scenarios less extreme than occurred on Sept. 11 where the city water supply could be disabled. The proposed change would require that a secondary water supply not rely upon the same upstream source as the primary supply.

Cost Impact: There is no cost impact of this proposal.

Task Group Comments: See previous comments.

Recommendation 13. Fire alarm and communication systems
CTC Task Group: Active Fire Protection

Regarding NIST Recommendation 13. NIST recommends that fire alarm and communications systems in buildings should be developed to provide continuous, reliable, and accurate information on the status of life safety conditions at a level of detail sufficient to manage the evacuation process in building fire emergencies, and that standards for their performance be developed.

CTC Dec minutes:
Discussion: Wireless technology is available.

NIST Strawman: None

Outcome: CTC to review within a package, including NIST Recs # 13 and #14.
Time frame: Long term

No strawman was specifically prepared for this recommendation.

Task Group Comments: See comments on Recommendation #12

Recommendation 14: Tactical decision aids
CTC Task Group: Active Fire Protection

Regarding NIST Recommendation 14. NIST recommends that control panels at fire/emergency command stations in buildings should be adapted to accept and interpret a larger quantity of more reliable information from the active fire protection systems that provide tactical decision aids to fireground commanders, including water flow rates from pressure and flow measurement devices, and that standards for their performance be developed.

CTC Dec minutes:
Discussion: See NIST Rec #13

No strawman was specifically prepared for this recommendation

Task Group comment: See comments on Recommendation #12

Recommendation 15: Black boxes and off-site information transmission for buildings
CTC Task Group: Active Fire Protection

Regarding NIST Recommendation 15. NIST recommends that systems should be developed and implemented for: (1) real-time off-site secure transmission of valuable information from fire alarm and other monitored building systems for use by emergency responders, at any location, to enhance situational awareness and response decisions and maintain safe and efficient operations; and (2) preservation of that information either off-site or in a black box that will survive a fire or other building failure for purposes of subsequent investigations and analysis. Standards for the performance of such systems should be developed, and their use should be required.

CTC Dec minutes:
Discussion: See NIST Rec #13

No strawman was specifically prepared for this recommendation.

Task Group Comments: See comments on Recommendation #12

NIST Recommendation #22
Emergency communications systems
CTC Task Group: Emergency communications

This recommendation focuses on the need for signal amplification systems("repeaters") in high rises. The task group looked at many jurisdiction's legislation to find out what those that have attempted to legislate any requirement for repeater systems have done. Most jurisdictions have amended either IBC or IFC to place a requirement for signal amplification systems. In general, there are three categories:

1. Jurisdictions that have a requirement for repeater systems and have left the technical parameters to local fire/police radio operators
2. Jurisdictions that have both a requirement and testing criteria within the legislation
3. Jurisdictions that have requirements for repeaters, testing criteria, and reception criteria for both in-bound and out-bound frequencies

At this time, the task group is undecided as to which approach is the most viable. In order to facilitate discussion on this subject, two examples illustrating approach 1 vs 2 are provided:

REPEATER SYSTEM REQUIRED – TECHNICAL BY OTHER

MONTGOMERY COUNTY, MARYLAND
AMENDMENT TO 2003 IBC

Add a new Section 3110 to read as follows:

Section 3110 In-Building Signal Amplification System.

Section 3110.1 General. The provisions of this Section shall apply to all newly-constructed below ground floors of a building, all floors in buildings greater than 25000 ft² per floor, and to all floors of buildings greater than 3 stories in height of Type I and II constructions.

Exception: The requirements of this section shall not apply to areas within an individual dwelling unit.

Section 1310.2 Where Required. Every floor area in a building or structures which can not achieve the required level of radio coverage as established by Montgomery County Department of Technology Services shall be provided with in-building signal amplification system.

Section 1310.3 Inspection and Testing. Radio coverage and in-building signal amplification systems must be tested, and inspected by approved individuals. The results of the testing and inspection shall be certified to the code official prior to issuance of an occupancy permit

REPEATER SYSTEM REQUIRED – TESTING CRITERIA INCLUDED

BOSTON FIRE DEPARTMENT
IN-BUiLDING RADIO SPECIFICATION

A. GENERAL

The Superintendent of Fire Alarm or Boston Fire Department (BFD) Fire Marshall under BOSTON FIRE DEPARTMENT, FIRE ALARM ORDER 93-1, has the authority to waive the "Fire Department communication system" and substitute a radio communications system to achieve effective Fire Department radio communications throughout the protected premise. Voluntary adoption of this alternative is subject to the specifications contained within this document.

B. RADIO COVERAGE

For purposes of this section, adequate radio coverage shall include all of the following:

1. A minimum signal strength of -95 dBm available in 95% of the area of each floor when transmitted from the Boston Fire Department.
2. A minimum signal strength of -95 dBm received at the FIRE DEPARTMENT SYSTEM from 95% of the area of each floor of the building.

C. AMPLIFICATION SYSTEM ALLOWED

Buildings and structures shall be equipped with any of the following, in order to achieve the required radio coverage: a radiating cable system or an internal multiple antenna system with FCC Type Accepted Bi-Directional UHF Amplifiers as needed to encompass BFD UHF frequencies 483/486 (Channels I through 4).The system shall be capable of operating on an independent battery and/or generator system for a period of at least twelve (12) hours without external power input. The battery system shall automatically charge in the presence of external power input. There shall be no connectivity between the amplification system and fire alarm system.

D. ACCEPTANCE TEST PROCEDURES

Acceptance testing for an in-building radio amplification system is required, upon completion of installation. It is the building owner's responsibility to have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 95%. Each floor of the building shall be divided into a grid of approximately forty (40) equal areas.

A maximum or two (2) nonadjacent areas will be allowed to fail the test. In the event that three (3) of the areas fail the test, in order to be more statistically accurate the floor may be divided into eighty (80) equal areas. In such event, a maximum of four (4) nonadjacent areas will be allowed to fail the test. After the eighty (80) area tests, if the system continues to fail, the building owner shall have the system altered to meet the 95% coverage requirement. Talk back testing from site to the Fire Alarm Office shall use a two (2) watt portable transceiver with speaker/microphone and flexible antenna. A spot located approximately in the center of a grid area will be selected for the test, then the radio will be keyed to verify two-way communication to and from the outside of the building through the Fire Alarm Office. Once the spot has been selected, prospecting for a better spot within the grid area will not be permitted. Field strength testing instruments are to be recently calibrated (1 year) and of the frequency selective type incorporating a flexible antenna similar to the ones used on the hand held transceivers.

The gain values of all amplifiers shall be measured and the results kept on file with the building owner so that the measurements can be verified each year during the 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.

A representative of the Boston Fire Department Radio Shop will oversee the acceptance test.

A Certificate of Occupancy will not be issued to any structure if the building fails to comply with this section.

E. ANNUALTESTS

When an in-building radio system is installed, the building owner shall test all active components of the system including but not limited to amplifier, power supplies, and back-up batteries, a minimum of once every twelve (12) months. Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Back-up batteries and power supplies shall be tested under load for a period of one (1) hour to verify that they will operate during an actual power outage. All other active components shall be checked to determine that they are operating within the manufacturers specifications for the intended purpose.

F. FIVE YEAR TEST

In addition to the annual test, the building owner shall perform a radio coverage test a minimum of once every five (5) years to ensure that the radio

system continues to meet the requirements of the original acceptance. The procedure set forth above shall apply to such tests.

G. QUALIFICATIONS OF TESTING PERSONNEL

All tests shall be conducted, documented, and signed by a person in possession of a current FCC GENERAL RADIOTELEPHONE OPERATOR LICENSE. Ail test records shall be retained at the inspected premises by the building owner and a copy submitted to the BOSTON-FIRE DEPARTMENT.

H. FIRE DEPARTMENT INSPECTIONS

Fire Department Radio personnel, after providing reasonable notice to the owner or his representative, shall have the right to enter onto the property to conduct field testing to be certain that the require level of radio coverage is present.

I. PROPERTY OWNER LETTER

At final acceptance the applicant shall supply a letter to the Superintendent of Fire Alarm, 59 Fenway, Boston, MA 02115, accepting the property owners responsibilities. These responsibilities are as follows: upgrades to system as directed by the Boston Fire Department, maintenance contract in place with name of contractor, who will provide a 24 hour by 7 day emergency response within two (2) hours after notification and contact personnel with phone numbers.

This letter is to be on company letterhead signed by the property owner or a legal representative.

J. REQUEST FOR WAIVER

A WAIVER from the Superintendent of Fire Alarm or Boston Fire Department Fire Marshall is required for radio equipment usage In lieu of a telephone system in high rise occupancies. The applicant shall make a formal request in writing to the Superintendent of Fire Alarm, 59 Fenway, Boston MA 02115. The request shall state address of property , property owner (responsible party), radio equipment vendor, contact personnel with telephone numbers, radio system drawings with technical parameters, and equipment specifications shall accompany the waiver request. Applicants will receive a written re[ply within thirty (30) days. This waiver is the initial step in this procedure and required before proceeding

Voluntary adoption of this specification for buildings not covered by under BOSTON FIRE DEPARTMENT, FIRE ALARM ORDER 93-1 also

requires a waiver.

K- REQUIRED FORMS

All required forms can be obtained from the Boston Fire Radio Shop,
59 Fenway, Boston, MA 02115, (617) 343-2875.
A. Initial Acceptance Ten
B. Annual Test
C. Five Year Test

L.. CABINET

The cabinet shall be a NEMA 4 painted steel cabinet. The color will be FIRE ENGINE RED and bear the lettering as follows: BOSTON FIRE DEPT. RADIO, 617-343-2875 in bright yellow. The cabinet will have a lock mechanism to keep the unit secure.

M. PRIMARY POWER

Connection to primary power can be done in two (2) manners. The first, a cord set with twist lock plug and receptacle or with metallic conduit. Each bi-directional amplifier shall be powered by its own twenty (20) ampere circuit.

N. SYSTEM MONITORING ALARM

Each amplifier unit will have a monitoring system that monitors amplifier operation and primary power. Upon failure a Sonalert audible warning device(90 dB minimum) will activate. Silencing of this alarm is the responsibility of the equipment maintenance contractor. The FIRE DEPT. is to be notified of any failures that extend past the two (2) hour time limit.

Recommendation 26: Egress and fire protection in existing buildings
CTC Task Group: Active Fire Protection

Regarding NIST Recommendation 26. NIST recommends that state and local jurisdictions should adopt and aggressively enforce available provisions in building codes to ensure that egress and sprinkler requirements are met by existing buildings. Further, occupancy requirements should be modified where needed (such as when there are assembly use spaces within an office building) to meet the requirements in model building codes.

CTC Dec minutes:

Discussion: The adoption and enforcement of the code is beyond the scope of the CTC and the I-Codes. As
noted in the NIST recommendations, the IEBC addresses conditions where the building is undergoing
repairs, alterations or a change in use. The IEBC does not include any retrospective requirements applicable
to existing buildings. Retrospective provisions, although limited in scope, are in the IBC and IFC.

NIST Strawman: None

Outcome: TRB is going to investigate the periodic inspection of fire proofing for existing buildings and
voice/alarm notification. TRB to submit to CTC.

No strawman was specifically prepared for this recommendation.

Analysis: The International Existing Building Code is applied for existing buildings undergoing a repair, alteration or change of occupancy. It is not a code with retrospective code requirements, such as sprinklers, for existing buildings. Such requirements would be located in the IFC. The IFC currently regulates means of egress in existing buildings (1026) and limited retrospective fire protection requirements – sprinklers (903.6), standpipes (905.11), and fire alarm and detection (907.3).

Task Group Comments: In addition to the answers provided regarding the IEBC and the IFC, there are criteria for mixed use in Chapter 3 that detail whether an assembly occupancy is an accessory or mixed use condition within a building. Changing from any type of occupancy is controlled in the IBC simply by a change in the application of the code.