CODES & STANDARDS FORUM

INTERNATIONAL CODE COUNCIL®

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In Memoriam
William J. Tangye
1945–2002

William J. (Bill) Tangye, 57, Chief Executive Officer of the International Code Council and of the Southern Building Code Congress International, passed away on June 1.

Mr. Tangye was named the first ICC CEO in September 2001. He had been CEO of SBCCI since 1982. He served as BOCA's Director of Field Engineering from 1970 to 1975. He earned a bachelor's degree in civil engineering from California State Polytechnic University, Pomona, in 1967, as well as graduate degrees from University of Southern California and California State University, Long Beach. Among his many honors was a 1987 appointment to the Architectural and Transportation Barriers Compliance Board (ATBCB) by then-President Ronald Reagan. He was then elected chairman of the ATBCB in May 1988.

A news release announcing Mr. Tangye's appointment as ICC CEO said "His knowledge of corporate management, paired with his expertise in engineering, code development and implementation services, gives him a solid background to lead ICC into the future as the world's leading developer of comprehensive, consistent performance-based and regulatory tools for the built environment."

Mr. Tangye is survived by his wife, Elaine B. Tangye; three sons, James Cole Tangye, William Patrick Tangye and Benjamin McKean Tangye; daughter, Cayce Belle Tangye; mother, LaRue McKean; and sister, Jeri McMillan.

The family requests memorials be sent to the William J. Tangye Scholarship Fund at Southern Building Code Congress International, 900 Montclair Road, Birmingham, Alabama 35213 or to the Lance Armstrong Foundation (www.laf.org).

2002 ICC Code Development Hearing Review

The following is a list of significant proposed changes that were considered at the public hearings in Pittsburgh, Pennsylvania on April 8-19, 2002. This includes changes that were both approved and disapproved with disapproved changes noted accordingly.

INTERNATIONAL FIRE CODE® Changes

Information on the permit (Proposed code change F13-02)

The proposed change addresses the technologies available to jurisdictions in issuing permits. With the revision, a computer-generated document could be accepted as a building permit without a signature.

Overcrowding (Proposed code change F28-02)

The proposal provides a definition for a condition that occurs in assembly and other occupancies.

Group R-2 (Proposed code change F120-02)

The proposal identifies that a manual fire alarm system is required in Group R-2 occupancies when the thresholds are met.

Motor Fuel Dispensing Facilities (Proposed code change F164-02)

The proposal replaces the term service stations with motor fuel dispensing facilities. The proposal correlates the IFC®, IBC®, IMC®, IFGC®, and IZC® to separate the occupancy requirements for the service/repairing of

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The I-Codes and Building Safety

by
John R. Battles, PE, CBO, Southern Building Code Congress
and
Beth A. Tubbs, PE, International Conference of Building Officials

After the attack on the World Trade Center Twin Towers on September 11, 2001, engineers, code officials, and emergency responders have asked themselves if something could have been done differently, either before or during the disaster. Similar questions arose after events such as Hurricane Andrew and the Northridge Earthquake; however the focus of these events was different since they were related to natural hazards versus an intentional act. Regardless, the focus after major disasters has always been on minimum loads and requirements and how to improve upon them.

We cannot change the past, but we can learn from it. In the aftermath of the World Trade Center attack, attention will likely be directed towards structural performance, fireproofing of steel members, evacuation of occupants and emergency responder needs.

Have we learned anything from the past? The *International Code Council* (ICC)® shows it has. It has developed and made available an impressive collection of International Codes™, which includes the *International Building Code* (IBC)® and the *ICC Performance Code for Buildings and Facilities* (ICCPC)™.

What is the purpose of the codes? Simply speaking, the codes establish minimum requirements to safeguard public health, safety and general welfare. The IBC accomplishes this by providing prescriptive provisions and addresses the following issues: maximum building height and area, minimum type of construction, fire-resistance rating of construction, fire protection systems, means of egress, and structural design. Many of the provisions in this code are based on past experiences such as fires and natural disasters, but much of it is also linked back to a more technical approach, e.g., structural design.

The ICCPC accomplishes this through a different method. By definition, a performance code details the expectations of how a building or structure should react during and after a significant event. It also details how a building should perform with everyday use. A performance code typically addresses the same issues as the traditional, prescriptive building codes, but instead uses concepts such as design performance levels, objectives, functional statements, and performance requirements. In this type of code the focus moves away from "minimums" to what is "acceptable." A performance code, however, will usually allow the use of the prescriptive codes to demonstrate compliance.

The intent of the ICCPC is to provide an acceptable level of health, safety and welfare, and to limit property damage in events that are expected to impact buildings and structures. The code intends for buildings and structures to provide for the following, among others:

1. An environment free of unreasonable risk of death and injury from fires.
2. A structure that will withstand loads associated with normal use and severity associated with the structure's location.
3. Means of egress: an access for normal and emergency circumstances.
4. Limited spread of fire both within the building and to adjacent properties.

The design performance level concept creates a framework to better understand the acceptable level of damage or losses based upon a particular design load or "magnitude of event." In order to accomplish this, it places buildings into performance groups. Performance groups are similar to the importance factors used in earthquake design, e.g., more important or significant buildings are placed in higher groups. These factors help determine how a building or facility is expected to perform in terms of tolerable limits under varying load conditions.

Even though the ICCPC addresses all aspects of buildings and facilities, code officials and engineers have focused on specific issues since the World Trade Center attack. The following are a few applicable statements found within the body of the performance code.

STABILITY

The objective is to provide a desired level of structural performance when structures are subjected to loads that are expected throughout their intended lifetime. The structures are to be designed and constructed to prevent injury to occupants and loss of property caused by the loading of a structural element or system consistent with the design performance level. Structures shall be designed to sustain local damage, with the structural system as a whole remaining stable and not damaged to an extent disproportionate to the original local damage. The structures are to be designed and constructed taking into account all expected loads, and combination of loads, associated with the event magnitude that would affect their performance.

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The I-Codes and Building Safety *(continued from previous page)*

MEANS OF EGRESS

The objective is to protect people during egress and rescue operations. The structure is to be designed to enable occupants to exit the building, facility and premises, or to reach a safe place appropriate to the design performance level. The construction, arrangement and number of means of egress, exits and safe place for buildings shall be appropriate for the travel distance, number of occupants, occupant characteristics, building height and safety system and features.

EMERGENCY RESPONDER SAFETY

The objective is to protect the emergency responders from unreasonable risks during emergencies. Emergency responders are to be provided with information regarding hazards present in the building or premises, protected against unanticipated structural collapse, and provided with appropriate communications capability. The buildings and structures are to be designed, constructed, loaded and maintained so that the potential for structural collapse is predictable based on the construction method, building condition and fire size, location and duration.

It has been debated both publicly and privately as to how the Trade Center towers collapsed and whether the collapse could have been prevented. The prevailing opinion seems to be that the impact of the planes alone was not enough to bring down either tower. Ultimately, it was likely the combination of structural damage, damage to the fire proofing, and the fires that led to the collapse due to the weakening of the structural steel. Another factor is that the impact of the planes may have heavily damaged the sprinkler system, and, even if in place, the system may have had difficulty performing as designed because of the size of the fire. As the heat increased and the structural system got weaker, "progressive collapse" took place. These issues will likely be clarified with continued investigations into the incident.

As stated earlier, prescriptive codes address "minimum" loads while performance codes address "anticipated/expected" loads and events. Today, the design community, standards developers (such as ASCE), and ICC must look carefully at both what the "minimum" should be and what loads are "anticipated and expected." It is important to understand that not all buildings will likely need to be designed to such extreme loads, but providing a framework to better understand the needs of a particular building is necessary.

The following is a quote from the Executive Summary of the World Trade Center Building Performance Study:

> "During the course of this study, the question of whether building codes should be changed in some way to make future buildings more resistant to such attacks was frequently explored. Depending on the size of the aircraft, it may not be technically feasible to develop design provisions that would enable all structures to be designed and constructed to resist the effects of impacts by rapidly moving aircraft, and the ensuing fires, without collapse. In addition, the cost of constructing such structures might be so large as to make this type of design intent practically infeasible.
>
> Although the attacks on the World Trade Center are a reason to question design philosophies, the BPS Team believes there are insufficient data to determine whether there is a reasonable threat of attacks on specific buildings to recommend inclusion of such requirements in building codes. Some believe the likelihood of such attacks on any specific building is deemed sufficiently low to not be considered at all. However, individual building developers may wish to consider design provisions for improving redundancy and robustness for such unforeseen events, particularly for structures that, by nature of their design or occupancy, may be especially susceptible to such incidents. Although some conceptual changes to the building codes that could make buildings more resistant to fire or impact damage or more conducive to occupant egress were identified in the course of this study, the BPS Team felt that extensive technical, policy, and economic study of these concepts should be performed before any specific code change recommendations are developed. This report specifically recommends such additional studies. Future building code revisions may be considered after the technical details of the collapses and other building responses to damage are better understood."

The ICC sees the need to push ahead and provide tools for regulations which fit the needs of both the present and the future. It is ICC's hope that the family of I-Codes™ and the pursuit of performance-based regulatory issues will provide those tools.

ICC was established in 1994 by Building Officials and Code Administrators International, Inc. (BOCA)®, International Conference of Building Officials (ICBO)®, and Southern Building Code Congress International, Inc. (SBCCI)® as a nonprofit organization dedicated to

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vehicles from the occupancy requirements for the dispensing of fuels into motor vehicles. The change in terminology helps to delineate the use in vehicle-related occupancies.

Hydrogen Motor Fuel Dispensing and Generation Stations (Proposed code change F176-02)

This proposal introduces provisions for the storage, use, and handling of hydrogen fueling systems as a fuel for motor vehicles. This provides requirements for new technologies that are not presently in the code, but which are needed to provide guidance on how these types of fueling facilities should be addressed.

Weather Protection (Proposed code change F245-02)

This proposal provides the specific information that when weather protection is provided the structure supports and walls shall not obstruct more than one side or 25 percent of the perimeter of the storage or use area.

Intent of the IFC (Proposed code change F2-02)

Although the proposal was disapproved, it is worth noting because it proposes to add language for firefighter and emergency responder safety during emergency operations. Code change G2-02 was Approved As Modified by the IBC General Code Committee which proposed to put similar language in the IBC.

ICC PERFORMANCE CODE CHANGES for Buildings and Facilities

There were only 14 code changes submitted for this document. All of the items were disapproved. The following are summaries of the two most heavily debated issues.

Emergency responder safety (Proposed code change PC1-02)

The issue of whether to add specific language to highlight emergency responders within Section 101.2, Intent, of the ICCPC was debated. The concern with adding this specific language was the way in which Section 101.2 was originally drafted. It was argued that the current code language would already include all people. Therefore, a specific reference to emergency responders would not be necessary. Others on the committee saw the potential need for specific language to highlight the protection of emergency responders but were not happy with the proposed language. It should be noted that there are two chapters within the ICCPC that specifically address both emergency responder safety and also access, facilities and notification for emergency responders (Chapters 20 and 21).

Appendices references (Proposed code changes PC2-02, PC4-02 through PC8-02 and PC14-02)

There were a series of code changes submitted by the Code Correlation Committee to establish how the appendices were to be addressed within the ICCPC. Currently, the ICCPC is unique in that appendices are specifically referenced within the body of the code. These code change proposals provided three options to address these inconsistencies, which included the following:

1) Provide a new section within Chapter 1 which would note the appendices as being guidance only,

2) Simply remove direct references from the body of the code but keep the appendices, or

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The I-Codes and Building Safety *(continued from page 3)*

developing a single set of comprehensive and coordinated national model construction codes. ICC has developed and now offers an impressive inventory of International Codes, including:

International Building Code
ICC Performance Code for Buildings and Facilities
International Fire Code
International Fuel Gas Code®
International Mechanical Code®
International Plumbing Code®
International Private Sewage Disposal Code®
International Residential Code®
International Property Maintenance Code®
International Zoning Code®
International Energy Conservation Code®
ICC Electrical Code Administrative Provisions™

All of these codes are comprehensive and coordinated with each other to provide the appropriate package for adoption and use in the 21st Century.

Any interested individual may submit a code change proposal and participate in the public hearings in which it is considered. This open debate and broad participation before a committee comprising representatives from across the construction industry, including code regulators and construction industry representatives, ensures a consensus of the construction community in the decision-making process.

For more information about ICC, you can contact them at 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, (703) 931-4533, staff@intlcode.org or visit the ICC website at www.intlcode.org.

3) Delete the appendices and all references.

Options 1 and 2 could be combined to a certain degree. However, there was a concern that the appendices were critical to the application of the code. Although the concern of the correlation committee was understood, several of the appendices were considered necessary for the application of the code and should not be strictly advisory. Another alternative that was discussed was the concept of moving the more critical appendices into the body of the code. The correlation committee had not provided this option as it would have constituted a technical change, which is outside its scope as a committee.

INTERNATIONAL EXISTING BUILDING CODE - FINAL DRAFT® CHANGES

Structural frame (Proposed code change EB13-02)

This proposal deletes the definition of "Structural Frame" from Section 202 of Chapter 2 so that its application is consistent under the IEBC and the IBC.

Seismic repair design (Proposed code change EB31-02)

This proposal revises the original Section 407.3.2.1.1 to require the repair design to comply with the seismic design forces based on the larger of the forces determined in accordance with the building code at the time the building was constructed and the reduced IBC level seismic forces as specified in Section 407.1.1.3.

Door swing in alterations level 2 (Proposed code changes EB56-02 and EB58-02)

These proposals will expand the application of the exceptions to Sections 605.4.2 and 605.4.3 to include means of egress within or serving tenant spaces that are entirely outside of work areas to not be required to comply with door swing requirements where the work area exceeds 50 percent of the floor area for the floor under consideration.

Means of egress lighting (Proposed code change EB63-02)

This proposed change will expand the application of the exception to Section 605.7.2 to include means of egress within or serving tenant spaces that are entirely outside of work areas to not be required to comply with means of egress lighting requirements where the work area exceeds 50 percent of the floor area for the floor under consideration.

Continuity of dwelling separations through concealed spaces in alterations level 3 (Proposed code change EB72-02)

This proposal changes Section 703.2.1 to require the existing fire-resistance separation between dwelling units in alterations level 3 be continued through concealed spaces to the roof deck except for instances where alterations do not result in removal of wall or ceiling finishes exposing the structure.

Historic buildings in flood hazard areas (Proposed code change EB102-02)

This proposal eliminates the current text of Section 1001.4 and adds new text to require historic buildings undergoing substantial improvement to comply with Section 1612 of the IBC, unless the historic building continues to be an historic building after the improvements. Historic buildings for this section are more narrowly defined compared to the definition in Chapter 2.

Accessibility (Proposed code changes EB40-02, EB109-02, EB110-02 and EB117-02)

These changes were introduced to make the IEBC more consistent with the proposed final draft of the ADAAG. Similar code change proposals had been submitted to the IBC and IRC.

INTERNATIONAL BUILDING CODE STRUCTURAL CODE CHANGES

Simplified wind provisions updated (Proposed code change S23-02)

This proposal will make the IBC simplified wind provisions identical to those of ASCE 7-02. While the loads remain virtually the same, the procedure has been made clearer.

Replacement of IBC seismic load provisions with references to ASCE 7 seismic load provisions (Proposed code changes S40-02, S41-02, S43-02, S57-02, S60-02, S64-02, S73-02 & S83-02)

This series of proposals replaces significant portions of the seismic load provisions in Chapter 16 of the IBC with references to the corresponding provisions in Chapter 9 of ASCE 7-02, while retaining basic scoping provisions in the IBC. S40-02 and S41-02 replace the IBC provisions for building configuration and analysis procedures, respectively, with ASCE 7 references. S43-02 deletes most of IBC Section 1617 in favor of references to ASCE 7. S57-02 replaces the dynamic analysis procedures of IBC Section 1618 with a reference to ASCE 7. S60-02 substitutes a reference to ASCE 7 for the structural component design and detailing requirements currently in IBC Section 1620. S64-02 replaces the nonstructural component design requirements in IBC Section 1621 with a reference to ASCE 7. S73-02 substitutes the nonbuilding structure provisions of ASCE 7 for those of IBC Section 1622. S83-02 replaces the seismic isolation provisions of IBC Section 1623 with a reference to ASCE 7.

Latest edition of ACI 318 adopted (Proposed code change S115-02)

This proposal adopts ACI 318-02 as the basis for concrete design and construction under the IBC. Numerous

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revisions to the IBC concrete provisions are made for consistency with this latest edition of ACI 318. In addition, the anchorage design provisions of IBC Section 1913 are replaced by a reference to Appendix D of ACI 318 which contains nearly identical requirements.

Latest editions of ACI 530/ASCE 5 /TMS 402 and ACI 530.1/ASCE 6 /TMS 602 adopted (Proposed code change S122-02)

This change adopts the 2002 editions of ACI 530/ASCE 5 /TMS 402, Building Code Requirements for Masonry Structures and ACI 530.1/ASCE 6 /TMS 602, Specification for Masonry Structures. Numerous revisions to the IBC masonry provisions are made for consistency. Since ACI 530/ASCE 5 /TMS 402 now contains strength design provisions for masonry, these are now referenced and the majority of IBC Section 2108 will be deleted.

Reorganization of steel chapter (Proposed code change S160-02)

This reorganization of IBC Chapter 22 provides a more user-friendly format. The proposal also introduces perforated shear wall provisions for use with cold-formed steel-framed walls. In addition new AISI standards for cold-formed steel framing are adopted by reference.

Hazardous locations for glazing (Proposed code changes S187-02 and S193-00)

The ICC Ad Hoc Glazing Committee was formed to consider the issue of glazing in hazardous locations. Its formation was prompted by the ongoing debate of wired glass limitations at previous code hearings. Code change proposals S187-02 and S193-02 were the result of the committee's deliberations. S187-02 reorganizes the safety glazing provisions of Section 2406 and, more importantly, requires all glazing in Group E occupancies to comply with CPSC 16 CFR 1201. The net effect of this change is that wired glass complying with ANSI Z97.1 would no longer be an acceptable alternative in fire doors, fire windows and view panels in fire-resistant walls in a Group E occupancy. S193-02 reorganizes Section 2408 and adds language making it clear that these provisions apply to gymnasiums, basketball courts and similar athletic facilities.

INTERNATIONAL BUILDING CODE FIRE SAFETY CODE CHANGES

Buildings on the same lot (Proposed code change FS8-02)

Code change FS8-02 clarifies the intent of the provisions in Section 704.3 relative to the required exterior wall rating for buildings on the same lot. In the 2000 edition, the text inferred a requirement that courts associated with a building would be required to be separated from the building, treating the court walls as exterior walls. As stated by the proponent of the change, this approach goes "against the basic philosophy of the code that you cannot protect a building from itself." The approved change resulted in the text for courts being deleted from the section.

Elevator lobbies (Proposed code changes FS 24-02 through FS 30-02)

Numerous code changes were submitted to Section 707.14.1, Elevator lobby, ranging from: revising the required separation from a fire barrier to a fire partition (FS 24-02; approved); to changing the thresholds which trigger the lobby provisions (FS25 through FS27; all disapproved); to deleting the lobby provisions in their entirety (FS30-02; disapproved).

Shaft penetrations (Proposed code change FS61-02)

The current text of the IBC, in Section 715.3.1, requires both a fire damper and smoke damper at duct penetrations into the shaft, with exceptions where the fire damper can be omitted. Code change FS61-02, approved as modified, adds exceptions for the smoke damper: in Group B occupancies for bath exhaust ducts; ducts part of a smoke control system; and shafts in parking garages.

Roof structures (Proposed changes FS104-02 and FS106-02)

Roof structures, such as towers and spires, are allowed up to 85 feet above grade where they are constructed of materials with a fire-resistance rating that mirrors the building upon which they are erected. Beyond 85 feet, they must be constructed of noncombustible materials. These revisions increase the threshold beyond the 60-foot current limitation based on FS104-02, which was approved as modified. The current 40-foot limitation for noncombustible construction above the roof was increased to 60 feet in accordance with FS106-02.

ICC ELECTRICAL CODE CHANGES

Nonmetallic sheathed cable (Proposed code changes EL1-02, EL4-02, EL5-02 EL6-02 and EL7-02)

All of these code change proposals, in one manner or another, attempted to delete the ICC *Electrical Code* text that allows Type NM cable wiring methods to be used without limits on the height or number of stories of a building. All were disapproved, as have been similar proposals in past cycles. The committee believes: that its action is consistent with what the ICC membership has voted in the past; that there is no technical support for the claim that Type NM cable is an unacceptable risk factor in building construction; that if Type NM cable were actually an unsafe wiring method in buildings more

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than three stories, it would not have been allowed in any building; and that regulating construction materials in relation to building height and stories is appropriate in an ICC document.

The NEC (NFPA 70) 2002 edition now addresses Type NM cable in a similar manner and no longer places a story restriction on the use of Type NM cable. Instead, it states in Section 334.10 that Type NM cables are permitted to be used in any dwellings, single through multiple-family, that are of construction Type III, IV or V and in any occupancy of Type III, IV or V construction if the cables are protected by a 15-minute or greater thermal barrier. The limits on building height and number of stories are now linked to the IBC's provisions for the construction type of the building. This could allow Type NM cable in buildings up to six stories, depending on the construction type, occupancy and fire suppression system. It is noteworthy that the NEC text states where Type NM cable is permitted to be used but does not state that Type NM cable is prohibited in buildings other than those specified in Section 334.10.

ICC *Electrical Code* (Proposed code change EC2-02)

EL2-02 was recommended for disapproval thus sending the message to the ICC Board of Directors that the committee believes that the ICC *Electrical Code* should remain as a distinct ICC document rather than merging it with the IBC. The sole purpose of EL2-02 was to allow the membership to speak its mind relative to the future of the ICC *Electrical Code*. If EL2-02 had been recommended for approval, the message to the Board of Directors would be that the committee wished to discontinue publication of the code and relocate its contents into the body of the IBC.

INTERNATIONAL BUILDING CODE GENERAL CODE CHANGES

Fire-fighter safety (Proposed code change G2-02)

Although the intent of the current code text is that fire fighters and other emergency responders are included in the stated intent of the IBC as expressed in Section 101.3, this proposed code change would add specific language to that section stating that it is the intent of the code to provide safety to fire fighters and other emergency responders. The IBC General Code Development Committee modified the proposal to delete text which has the potential to cause inconsistent enforcement by being overly broad in nature.

Covered mall anchor building separation (Proposed code change G44-02)

This proposed code change would clarify the type of separation required between anchor buildings and covered mall buildings where an anchor building is classified in an occupancy group that is not permitted as a portion of the covered mall building. This proposed code change would clarify that such an anchor building would be required to be separated from the covered mall building by fire walls constructed in accordance with Section 706. It would also help resolve the issue that existing malls constructed in compliance with the provisions of the *Standard Building Code* (which did not require a fire wall separation between anchor stores and the covered mall) or the *Uniform Building Code*™ (which required an area separation wall not required to have structural independence as required by Section 706) from being in violation of current IBC provisions.

Covered mall kiosk construction (Proposed code change G137-02)

This proposed code change provides an expanded list of combustible materials to be allowed in the construction of combustible kiosks within the mall and is intended to provide additional flexibility in the construction of these kiosks, recognizing the fact that these materials are presently being used but without specific guidance in the code. The performance criteria being proposed are comparable to those presently required for the allowable use of fire-retardant-treated wood and would not introduce any more significant a fire safety hazard within the mall if such combustible materials are used.

Frontage increase width limits (Proposed code change G141-02)

This proposed code change would make the building area increases allowed for open frontage more logical and appropriate. Group A-4, B, E, F, M or S occupancies are all permitted to be unlimited in area by Section 507.2. The current provisions limit the increase to $W/30 = 1.0$, which is an increase to the tabular area in Table 503 of 75 percent. Any additional open perimeter beyond 30 feet will not provide any benefit to the building until it reaches 60 feet at which point it will be allowed to be unlimited. This is inconsistent with the principle that separation between buildings results in increased safety. This proposed code change will continue to allow the same percentage of increase beyond the 30-foot limit up to 60 feet and will eliminate the arbitrary restriction on area increases that exist between 30 feet and 60 feet. Because of the $W/30$ portion of the equation, it is a straight-line relationship, allowing an increase up to 150 percent when the open space is at the 60-foot threshold for unlimited area buildings. There is nothing about the difference between 59 feet and 60 feet that justifies restricting a building to a 75 percent area increase when the next foot will allow it to be unlimited.

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INTERNATIONAL BUILDING CODE MEANS OF EGRESS CODE CHANGES

Chapter 10 reorganization (Proposed code change E80-02)

Proposal E80-02 would reformat Chapter 10 such that it has 25 separate sections to assist code users to locate easily and remember the location of the major means of egress topics. The new numbering system would make conversations regarding the code sections and their requirements easier. It is more convenient for items that are commonly referenced to have their own sections that would be listed in the Table of Contents.

Doors (Proposed code changes E25-02 and E28-02)

The problem of keeping water from coming under doors and into a dwelling will be helped by the approval of code change E25-02. The threshold height limit would be increased for those exterior doors that are not a component of the required means of egress and are not on an accessible route.

Proposal E28-02 would reorganize and refine the provisions for door operations in current Section 1003.3.1.8 of the 2000 IBC Supplement. The requirements for door handles, pulls, latches, locks and other operating devices on doors that are required to be accessible would be included in the new text.

Safe dispersal outside buildings (Proposed code change E33-02)

The "safe dispersal" area provisions for educational use school grounds would be deleted by E33-02. The "3 square-foot area per occupant" requirement in the current text was viewed as inadequate and it does not provide adequate space for disabled persons. The current 50-foot minimum required distance from the building to the dispersal area is not sufficient for safety during a building fire. Also urban schools do not have adequate room for dispersal areas.

Travel distance (Proposed code change E43-02)

Proposal E43-02 would add text that clarifies how travel distance is to be measured where unenclosed exit ramps or stairways are part of the means of egress in a Group A-5 occupancy. The travel distance would not be limited for these exit elements in an outdoor facility. This is similar to how travel distance is addressed in open parking garages.

Exits and exit discharge (Proposed code changes E60-02 and E64-02)

Proposal E60-02 would add exterior ramps to the exterior exit stairway requirements such that the code requirements would be the same for both. Exterior exit ramps are not currently addressed by the exit provisions.

Provisions for the exit discharge of stairways in open parking structures would be defined by E64-02. Such stairways would be allowed to egress through the open parking structure at the level of exit discharge.

Bleachers and grandstands (Proposed code change E68-02)

Proposal E68-02 would add a reference to a new ICC standard entitled "ICC Standard on Bleachers, Folding and Telescopic Seating and Grandstands." Text revisions to sections in Chapters 2, 10, 16 and 34 would be made for compatibility with the new standard.

Emergency escape (Proposed code change E74-02)

New text that requires an emergency egress and rescue opening in each sleeping room of a basement would be added by E74-02. Adjoining areas of the basement would not be required to have any additional emergency egress and rescue opening.

ACCESSIBILITY CODE CHANGES

A series of amendments were presented at the hearings in Pittsburgh with the goal of harmonization with the current draft of the proposed Americans with Disabilities Act Accessibility Guidelines (proposed ADAAG). As part of this package, a 19-point amendment was proposed to be added to E81-02. The question was split into two items for purposes of discussion. While the published proposal, Item 1, was disapproved, 13 of the 19 points in Item 2 were approved. Modifications for harmonization were also proposed to E84-02, E94-02, E95-02, E103-02, E108-02, E111-02, E112-02, E113-02, E114-02, E115-02, E116-02, E117-02, E119-02, E121-02, E123-02, E124-02, E129-02 and E130-02. In evaluating these changes, it is important to look closely at the Report to the Public Hearings to see how the proposed code changes were modified. Topics addressed in the modification to E81-02 are throughout Chapter 11, Section 3408 and Appendices E and J. (Note: Appendices E and J were originally intended for information only. They include items that are in the proposed ADAAG, that cannot be addressed through the building code enforcement process, but are necessary for compliance with ADAAG.) Proposals in E81-02 included: adding standby power for platform lifts that are utilized as part of a means of egress; new requirements for detention and correction facilities; additional exceptions for levels to be connected by an accessible route; and additional exceptions for operable parts.

Proposal E84-02 expanded the requirements for employee work areas.

Exceptions for areas where containment of hazardous chemicals or sterile environments were provided were added by proposal E85-02.

Accessible parking and passenger loading zone requirements were clarified by proposals E97-02, E99-02, E100-02 and E101-02.

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Special requirements for accessibility in Group I-3 facilities and in judicial facilities were added by proposals to E81-02, E103-02 and E117-02.

Proposal E104-02 included requirements for accessible dwelling and sleeping units in congregate-type living arrangements such as boarding houses, dormitories, fraternity houses and sorority houses. These are coordinated with the proposed ADAAG.

Proposals E108-02, E111-02, E112-02 and 113-02 were modified as a package to offer coordination with both the proposed ADAAG and the new approach to accessible seating offered in the ICC A117.1-2003. Some of the resulting changes were a reduction of the number of wheelchair spaces required in large facilities; access provided to special boxes and suites; and the deletion of the cluster concept in favor of the proposed ICC A117.1-2003 requirements. Proposal E114-02 clarified requirements for assistive listening systems in assembly spaces.

Dining area requirements were modified by proposals E115-02 and E116-02.

In accordance with proposals E122-02, E123-02 and E128-02, platform lifts shall be installed in accordance with ASME A18.1 with A18.1a-2001; and will be permitted as part of the accessible routes to additional locations, such as to speaker's platforms, in assembly seating to meet dispersion requirements and where exterior site constraints make a ramp or elevator infeasible.

INTERNATIONAL PROPERTY MAINTENANCE CODE CHANGES

Referencing the *International Existing Building Code* (Proposed code change PM1-02)

A recommendation for approval was submitted to add the reference *International Existing Building Code* to the intent and application of this code for repairs, alterations, additions and change of occupancy in existing buildings.

Definitions (Proposed code changes PM5-02 202 and PM6-02 202)

Three new definitions were submitted for approval that would define the following terms: inoperable motor vehicle, easement and public way. The definition for an inoperable motor vehicle would include, but not be limited to, being unlicensed, wrecked, abandoned, in a state of disrepair or incapable of being moved. Defining the term easement would be that portion of land or properly reserved for present or future use by a person or agency other than the legal fee owner(s) of the property. Lastly, defining public way would include any street, alley or similar parcel of land essentially unobstructed from the ground to the sky, which is deeded, dedicated or otherwise permanently appropriated to the public for public use.

Swimming pools, spas and hot tub enclosures (Proposed code change PM10-02)

A recommendation for approval was submitted to add enclosure requirements for swimming pools, spas and hot tubs and delete existing text which dealt with the maintenance of required self-closing and self-latching gates. Private swimming pools, hot tubs and spas would be required to be surrounded by a fence or barrier at least 48 inches in height and include a self-closing and self-latching door or gate. In addition, where the self-latching device is less than 54 inches above the bottom of the gate, the release mechanism must be located on the pool side of the gate

Building security, doors, windows and basement hatchways (Proposed code change PM13-02)

A proposed code change was submitted to add building security requirements for occupants of dwelling units that are rented or leased. The purpose of this section is to provide doors, windows or hatchways with devices designed to provide security for the occupants and property. These provisions would coordinate the *International Property Maintenance Code* with HUD housing quality standard requirements for rental properties.

Handrails and guardrails (Proposed code change PM15-02)

A proposed code change was submitted to add height requirements for existing handrails and guardrails. Existing handrails would need to be not less than 30 inches high or not more than 42 inches high measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. Guards would need to be not less than 30 inches high above the floor of the landing, balcony, porch, deck, or ramp or other walking surface. However, an exception was added that such guards are not required where exempted by the adopted building code.

INTERNATIONAL ZONING CODE CHANGES

Accessible parking spaces and passenger loading zones (Proposed code change Z4-02)

A proposed code change was submitted and approved to add a new section for accessible parking spaces and passenger loading zones. This would provide correlation with the *International Building Code* and reference to ICC A117.1 for the design and construction of such spaces.

Screening of parking areas (Proposed code change Z5-02)

A recommendation for approval was submitted to add requirements for the screening of parking areas with five or more parking spaces. The proposed code

(continued)

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change would require a landscaped screen a minimum of 5 feet in width of shrubs maintained at a height of 30 inches and a tree planted every 25 lineal feet within this strip. In addition, a definition for screening would be added which is defined as a method of reducing or shielding the impact of one use to another or reducing the impact of features within a development to surrounding areas.

INTERNATIONAL ENERGY CONSERVATION CODE CHANGES

Air leakage requirements (Proposed code change EC18-02)

Two new standards for determining air leakage of fenestration products, NAFS-1 and NFRC 400, were recommended for approval in this proposed code change. The intent of the exception for commercial entrance doors was clarified in a new Section 802.3.2.

Steel frame cavity insulation (Proposed code changes EC19-02 through EC23-02, EC29-02, EC30-02, EC38-02 and EC39-02)

Several code changes were recommended for approval to add insulation requirements for cavities in cold-formed steel framed buildings.

Climate zones (Proposed code change EC25-02, Part 1)

The committee recommended for approval a code change adding to several tables the climate zones corresponding to the Heating Degree Days listed in the tables with the intent of making the tables more user friendly. The Part 2 correlating change for the IRC was also recommended for approval by the IRC B/E committee.

Sunroom additions (Proposed code change EC33-02)

The proposed revision to footnote "e" of Table 502.2.5 was recommended for approval. It provides greater geographic diversity by requiring different *R*-values for the opaque ceilings and walls of sunroom additions in locations having more than 6,000 HDD and those having less than 6,000 HDD.

Interior lighting power (Proposed code change EC74-02, Part 1)

The proposed code change adds several new building or area types to Table 805.5.2 to allow more buildings to use the "entire building" method of calculating interior lighting power. This proposed code change was recommended for approval.

INTERNATIONAL RESIDENTIAL CODE BUILDING/ENERGY CODE CHANGES

Membrane penetrations (Proposed code change FS35-02, Item 2)

This proposal adds the separation requirements for listed nonsteel electrical outlet boxes on the opposite sides of a fire rated wall. The proposal will allow use of listed putty pads to protect steel and nonsteel outlet boxes on opposite sides of a fire rated wall.

Automatic garage door openers (Proposed code change RB50-02)

This proposed new section will require automatic garage door openers, if provided, to conform to the entrapment protection requirements of UL 325.

Emergency escape and rescue openings (Proposed code change RB51-02)

This proposal will delete the requirement that basements with habitable spaces have an emergency escape and rescue opening.

Landings for stairways (Proposed code change RB54-02)

This proposed change will add the requirement that a flight of stairs be limited to 12 feet between floor levels or landings. The current code would permit a straight run to extend up to three stories with no intermediate landings.

Stair treads and risers. Circular stairways. Winders (Proposed code changes RB53-02, RB60-02 and RB61-02)

These proposals redefine a winder as a tread and delete the circular stairway and winder requirements. Redefining a winder as a tread and placing it in the stair treads and riser section eliminates the need for circular stairway provisions since circular stairs are comprised of winder treads.

Design and design criteria (Proposed code changes RB26-02 and RB28-02)

These proposals add a new cold-formed steel framing standard as an alternate to the prescriptive requirements in the code and as a requirement for high wind and high seismic. The cold-formed steel framing high wind and high seismic requirements are deleted from the code and replaced by the new reference standard.

Protection against decay (Proposed code change RB72-02)

This change will require sills or plates that rest on concrete or masonry exterior walls to have decay protection regardless of distance from exposed ground. Currently decay protection is required only if the sill or plates are less than 8 inches above the exposed ground.

Foundation anchorage in Seismic Design Categories C, D_1 and D_2 (Proposed code change RB82-02)

This proposal adds additional foundation anchorage for townhouses in SDC C.

Floor cantilevers (Proposed code change RB95-02)

This proposal adds prescriptive requirements for cantilevered floor joists supporting an exterior balcony. The cantilevers range from 29 inches up to 72 inches depending on the ground snow load.

(continued)

Insulating concrete form wall construction (Proposed code change RB122-02)

This proposal expands the applicability limits for ICF walls to include maximum design wind speed of 150 mph and SDC D_1 and D_2.

Weather-resistant sheathing paper (Proposed code changes RB125-02 and RB126-02)

These proposals will require weather-resistant sheathing paper to be applied over studs or sheathing of all exterior walls. The current code contains exceptions that would permit omission of the paper. These changes delete those exceptions.

Masonry veneer anchorage (Proposed code change RB131-02)

This proposal reduced the maximum wall area that masonry or stone veneer wall ties are permitted to support from 3.25 square feet to 2.67 square feet.

INTERNATIONAL RESIDENTIAL CODE PLUMBING AND MECHANICAL CHANGES

Third-party test and certification for plumbing products and materials (Proposed code change RP11-02)

A proposed code change was recommended for approval to add a new section for products and materials requiring third-party testing and third-party certification. This would provide correlation with the *International Plumbing Code* and ease of use for the code official for enforcement of such products and materials.

Backflow protection applications (Proposed code changes RP22-02 and RP23-02)

Two proposed changes were recommended for approval to add a new table and update specific code sections regarding installation, standards and application of backflow prevention devices to provide further clarification to the user. This language already exists in the *International Plumbing Code*.

Shutoff valves for individual fixtures (Proposed code change RP28-01, Part 1)

The proposed change was modified by the committee to require an individual shutoff valve for each fixture except bathtubs and showers. Previously, only water closets were required by the IRC to have shutoff valves. The Part 2 correlating change was also recommended for approval in the IPC without the modification to exempt bathtubs and showers.

Valves (Proposed code change P68-02 Part 2)

A proposed change was recommended for approval that would require valves located in the potable water supply to comply with NSF 61. The Part 1 correlating code change was submitted to the IPC Committee and disapproved.

Intake and exhaust openings (Proposed code change RM1-02)

The committee recommended for approval three new sections to provide requirements for outside air intake and exhaust openings. These requirements were copied from the IMC to provide consistency between the codes.

Duct system design (Proposed code change RM9-02)

The prescriptive requirements for sizing and designing ducts were proposed to be deleted from the code and replaced with the design requirements of ACCA Manual D. This proposal was recommended for approval.

INTERNATIONAL PLUMBING CODE CHANGES

Location of plumbing fixtures in adjacent buildings (Proposed code change P24-02)

A code change to delete Note b in Table 403.1 was recommended for approval. The note was deemed to be unenforceable because the code official has no control over when adjacent buildings under the ownership or control of a church are open.

Separation of water service and building sewer (Proposed code changes P60-02 and P61-02)

Two proposed new exceptions were recommended for approval which would permit the installation of the water service pipe to be located in the same trench with the building sewer and provide an alternative method of installation where the water service would cross a sewer pipe. The first application would permit the water service to be located in the same trench with a building sewer provided the sewer is constructed of materials listed in Table 702.2 (underground building drainage and vent piping). This language already exists in the *International Residential Code*. The second application would permit the water service to cross a sewer pipe without the required separation distance provided the water service pipe is sleeved to at least 5 feet horizontally from the sewer pipe centerline, or both sides of such crossing with pipe materials listed in Tables 605.4, 702.2 and 702.3. The Part 2 correlating code change for the *International Residential Code* was also recommended for approval.

Water service pipe, water distribution pipe and pipe fittings (Proposed code changes P64-02 and P66-02)

A recommendation for approval was made to add Type 304/304L, stainless steel pipe for water service pipe, water distribution pipe and pipe fittings to Tables 605.4, 605.5 and 605.6 and Polyethylene/Aluminum/Polyethylene (PE-AL-PE) composite pipe for water distribution pipe to Table 605.5. A Part 2 correlating code change was

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submitted for the IRC to include stainless steel pipe and disapproved however, PE-AL-PE was recommended for approval for water distribution.

Combination drain and vent system (Proposed code change P92-02)

A proposed new application for combination drain and vent systems was recommended for approval. It would permit single fixtures of the type specified in Section 912.1, connected separately to the building drain a minimum of ten pipe diameters downstream from the base of any stack that would not require a dry vent. A Part 2 correlating code change was submitted for the International Residential Code and recommended for approval.

Pretreatment systems (Proposed code change P106-02)

A proposed code change was recommended for approval to add a new section for pretreatment systems. This section would provide criteria for the sizing, application and installation of pretreatment systems designated a pretreatment or discharge water quality compliance strategy. This system is designed to provide the reduction of the amount of pollutants, the elimination of pollutants or the alteration of the nature of pollutant properties in waste water released to a treatment facility.

Water pipe sizing method (Proposed code change P112-02)

A recommendation for approval was made to add an additional water pipe sizing method to Appendix E. This water pipe sizing method is a simple, prescriptive approach consistent with other water pipe sizing methods utilized. This method is also utilized in the *International Residential Code*.

INTERNATIONAL MECHANICAL CODE CHANGES

Hydrogen generation and refueling (Proposed code change M7-02, Part 1)

The committee recommended for approval a new section with requirements for the installation of hydrogen-generating appliances and refueling systems and the ventilation of spaces containing such appliances and systems. These requirements would apply to systems that use hydrogen to generate electricity in a fuel cell as well as systems that generate hydrogen to be used to refuel vehicles. The Part 2 correlating change for the IRC was disapproved by the IRC P/M committee with a successful assembly motion for approval.

Energy recovery ventilation systems (Proposed code change M22-02)

The committee recommended for approval a new section with requirements for the installation of energy recovery (ERV) systems which conserve energy by recovering energy from exhaust air and transferring the energy to the incoming outside air.

Grease duct and makeup air duct materials (Proposed code change M33-02)

This code change proposed to differentiate between the material requirements for grease ducts serving Type I hoods and makeup air ducts serving Type I hoods. Two new subsections for the different ducts were added to Section 506.3.2 and recommended for approval.

Capture and containment tests (Proposed code change M54-02)

A proposed code change was recommended for approval which adds new requirements for a field test to verify the exhaust system properly captures and contains the smoke and grease-laden air generated in the cooking process.

Foam plastic insulation in plenums (Proposed code change M62-02)

The committee recommended for approval a new section with requirements for the approval of foam plastic materials used as wall or ceiling finish in plenums.

Refrigerant classifications (Proposed code changes M79-02 through M84-02)

This series of proposed code changes updates Table 1103.1 by adding new refrigerants and revising refrigerant classifications and TLV-TWA quantities to the latest industry standards.

INTERNATIONAL FUEL GAS CODE CHANGES

Hydrogen fuel cells (Proposed code changes FG2-02, FG15-02, FG41-02 (part 1) and FG48-02)

These code change proposals are all products of the efforts of the ICC Hydrogen Ad Hoc committee and were all recommended for disapproval by the IFGC committee because of concerns about: technical flaws, omissions and deficiencies in the proposed hydrogen coverage; the lack of hydrogen expertise on the IFGC committee; and the appropriateness of such technology in a code that was created for coverage of traditional fuel gases. The committee also believed that because of the major differences in technology and the need for hydrogen-specific expertise, hydrogen should be covered in a separate code or as a separate chapter in the IFC. It was apparent that the committee and the majority of the hearing attendees were in favor of providing hydrogen coverage in an ICC document, however, the issue to resolve is which ICC document is appropriate for such coverage: the IFC, the IFGC or a new ICC hydrogen code?

2001 ICC Performance Code for Buildings and Facilities Overview

by
Brian Meacham, Robert Weber, Beth Tubbs and John Battles

The current buzzword in the world of building codes is "performance" (although it should be noted that several countries have been using performance-based codes for well over a decade). The main reason for the present trend can be attributed to trade pressures, deregulation and the advancement of engineering disciplines such as fire protection engineering. Performance-based building codes are also widely believed to encourage innovation.

The International Code Council (ICC) has just released the 2001 *ICC Performance Code for Buildings and Facilities* (ICC Performance Code)—the first broad-based performance code available in the United States The code stands alone from all other I-Codes and is available for adoption, but even if a jurisdiction has not adopted the code it can still be used as a tool for designers and code officials. It is intended that the current prescriptive codes be used as supporting documents.

This article is intended to provide a brief overview of how the ICC Performance Code relates to other I-Codes and review its overall structure and content. This will include a discussion of risk and how this new code provides a structured mechanism for better addressing hazards such as earthquakes, fires and hazardous materials releases, and possibly intentional acts such as arson and terrorism.

Background

ICC currently publishes a full set of "prescriptive" codes—codes that provide fairly specific solutions to achieving code compliance. "Performance" simply means that instead of providing a single solution or limited number of solutions, the focus is on the end result. In other words, a performance code focuses upon what is expected from a building during and after an emergency (or simply during normal use). A performance-based code describes the minimum level of losses that are tolerable; what results higher performance levels can achieve; and what functions the building needs to provide, such as accessibility. This approach is intended to force a review of a building and its location as a whole. How is the building being used? Do its occupants have unique characteristics? Is the building of special significance to the community?

The majority of current codes give building officials the authority to allow designs that do not meet the letter of the code if they can be shown to be equivalent with regard to ensuring the public safety. A performance code is based on this concept but takes it to another level. The major difference is that a performance code will provide more detailed guidance on the intent of the code and the necessary administrative process as well as a more substantial approach to determining whether a design is acceptable.

Structure

The ICC Performance Code is divided into four sections:

- I – Administrative Provisions,
- II – Building,
- III – Fire, and
- IV – Appendices

These sections reflect the fact that the code was created by two committees—a building committee and a fire committee. Part I includes provisions that were common to both committees. Part II is specific to the building committee and Part III to the fire committee.

The building and fire provisions were kept separate so that only parts of the code may be adopted if necessary. As a result, the building and fire sections contain some necessary areas of overlap. For example, the bulk of the code's means of egress provisions appear in Chapter 19, but there is a reference in Section 701 so that the provisions are available if a fire department adopts only Parts I and III.

I – Administrative Provisions

This section contains administrative, a method for the determination of design performance levels, and addresses reliability and durability; it is made up of the following chapters:

- Chapter 1 – Administrative Provisions,
- Chapter 2 – Definitions,
- Chapter 3 – Design Performance Levels, and
- Chapter 4 – Durability and Reliability.

The most important features of Section I are found in Chapters 1 and 3, both of which will be discussed in greater detail later in this article.

II – Building and III – Fire

These sections provide basic intent statements regarding the majority of subjects addressed within the

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2002 ICC Performance Code for Buildings and Facilities Overview *(continued from page 13)*

I-Codes. The statements contained in these sections are given in the following format.

Objectives are intended to reflect as closely as possible what society demands of buildings. In other words, what and who are the prescriptive codes trying to protect and from what? This section clarifies the intent and scope of the code for policymakers.

Functional statements describe how the building or facility needs to be designed and operated in order to achieve the objectives. They are general statements given without numerical values and serve as a transition from the objectives into something measurable.

Performance requirements break the functions of the building and facility down into more detail. Generally, there will be several performance requirements for each functional statement. For example, a functional statement may be that a building shall resist fire long enough for people to exit or relocate and for rescues to be undertaken. One of several performance requirements might state that building elements provide an appropriate level of fire resistance.

IV – Appendices

The appendices are provided solely for guidance. Although not considered appropriate for inclusion in the code proper, it was deemed important enough to provide along with the code document.

The appendices are provided as support for several portions of the code. In particular, Appendices A, "Risk Factors of Use and Occupancy Classifications," and B, "Worksheet for Assigning Specific Structures to Performance Groups," assist in the understanding of the use and occupancy of a building, and, as a result, aid in determining a structure's appropriate performance group for the purposes of applying Chapter 3.

Appendix C, "Individually Substantiated Design Method," provides a mechanism which allows the use of design methods that have not received widespread review and consensus by peers and industry. It provides some guidelines on the level of scrutiny needed before such methods should be allowed. This appendix relates to Section 104, pertaining to "Acceptable Methods."

Appendix D, "Qualification Characteristics for Design and Review of Performance-Based Designs," provides some additional guidelines to help determine if design team members, including reviewers, are appropriate. The qualifications needed to undertake performance-based designs, in many cases, are considered to be beyond the basic state registration laws. The guidance within this appendix focuses on relevant experience and general competence in certain subject areas, and relates back to Section 103 as it applies to qualifications.

Similarly, Appendix E, "Use of Computer Models," focuses upon the qualifications of modelers and the presentation of appropriate documentation relative to the limitations and application of a model. Computer models may be used for a variety of aspects of design, including but not limited to fire, structural and energy. This appendix provides some guidance for reviewers as to what should be included and addressed when such models are employed. The appendix relates back to Section 103 with regard to qualifications, review and documentation.

The Administrative Process

One of the most important aspects of the ICC Performance Code is not technical but is related to the administrative process for addressing performance-based designs—a feature not included in the "alternative materials, design and methods of construction" sections of the other I-Codes. Section 103 of the ICC Performance Code addresses the entire process, beginning with the design and following through to the long-term maintenance of the building (see Figure 1).

Responsibility

A common problem with design and construction today is a lack of communication and coordination among design team members, and one of the more important issues addressed by Section 103 is responsibility. The code clearly places responsibility upon the building or facility owner to obtain the leadership of a "Principal Design Professional." This specifically means one person is responsible for the project. The design professional need not work alone, but a single leader ensures a systematic execution of the project.

Qualifications

Along with responsibility comes qualifications. Although states have minimum requirements for the registration and certification of design professionals, performance design may demand higher and/or more specific requirements. The systematic approach of performance-based design is generally more complex than looking at a series of unrelated components, so the intent of the code is simply to stress that each member of a design team should possess the appropriate knowledge to undertake a particular design. For example, a fire protection engineer who specializes in sprinkler design would likely be an inappropriate choice for the design of a smoke control system, unless he or she has the assistance of someone with that expertise.

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2002 ICC Performance Code for Buildings and Facilities Overview *(continued from previous page)*

Documentation

One element not included in Figure 1 is the need for documentation. Section 103 requires several reports prior to the completion of a performance-based project: a conceptual report, a design report, and an operations and maintenance manual.

The conceptual report is to be submitted during the preliminary stage of a design and sets out basic information about the project's scope and objectives, providing a means for getting all of the stakeholders on the same page. It generally addresses qualifications, building and occupant characteristics, the extent to which the design will be performance-based in nature, and the site and building layout.

The design report contains all of the technical design work, including calculations and detailed specifications. It serves to identify critical design elements and provides a history that future design professionals can look to when making changes to the building or facility.

A prescriptive operations and maintenance code will need to be drafted for the particular building. Although the design report will contain information about critical design elements and the necessary required maintenance, it may not be appropriate for those using and maintaining the building. For instance, it would be unreasonable to expect a fire inspector to determine if an atrium had a potential fire size larger than 5000 kilowatts. Instead, criteria like "no more than two kiosks or two couches" would be more reasonable. The better such information is communicated, the more likely that pertinent issues will be observed and addressed.

Design Performance Levels

One of the features of the ICC Performance Code is the concept of design performance levels. Chapter 3 of Section I was developed to address certain restrictions in the prescriptive code such as those on height, area and types of construction. This led to a broader discussion on the differences in requirements for various occupancies and the need to understand the differing requirements. There are many complex reasons for these differences, but some include occupant characteristics (are people sleeping? are occupants familiar with the building? what are their physical and mental abilities?) and building use characteristics (will the facility be essential after a disaster? what is its importance to the community?).

Prescriptive codes inherently define the level of damage that can be tolerated after various events in terms of defined minimum requirements. Such information also needs to be understood before an event in a performance-based environment. After a major earthquake, for example, it may be required that a hospital still be capable of providing services or that a school can be reoccupied within a short period of time following a fire. By taking an up-front approach to assessing building performance after an event, a building owner or code official can review the stated (minimum) level of tolerable performance for a building and, considering the event and its possible impacts, opt for a higher level of performance if desirable.

This chapter makes an attempt at listing several damage levels and what they mean. These are generally broken into the following categories:

•Structural damage,

(continued)

Figure 1

2002 ICC Performance Code for Buildings and Facilities Overview *(continued from page 15)*

- Nonstructural damage,
- Occupant hazards,
- Overall extent of damage and
- Hazardous materials.

Varying types of events may warrant allowances for varying levels of impact. For instance, the tolerance for death when it comes to fire events is very low regardless of the size of the event, while nonstructural damage may or may not be an important criterion. Thus, larger variations in performance may be found with the extent of damage to property based on the size of a fire.

This chapter forces one to think about what should be expected after an event versus waiting to react after one has occurred. It also takes the focus away from minimum compliance and may encourage some owners to look beyond to objectives such as business continuity. Chapter 3 is also an excellent communications tool for communities, allowing them to vary the levels of performance expected of particular buildings within their jurisdictions. This may be a very relevant issue in the wake of recent events such as the attacks on the World Trade Center. We can no longer design and construct buildings in the United States based solely on the occupancy classification and related requirements found within the prescriptive codes. The location and significance of a building are also very important considerations with regard to the types of events that could potentially impact that building.

Energy Department Awards $2 Million to 22 States to Update and Implement Building Energy Codes

The Department of Energy (DOE) is awarding $1.989 million to 22 states to update and implement building energy codes, which will save consumers millions of dollars in energy bills and increase national energy security.

"These grants will enable states to improve the energy efficiency of new and renovated buildings by upgrading building codes, and will provide energy code training to more than 2,000 architects, builders, code officials and engineers," said Secretary of Energy Spencer Abraham. "The Department of Energy's Building Energy Codes Program contributes to President Bush's goal of improving the energy efficiency of buildings, as outlined in his National Energy Plan."

DOE is providing funding through State Energy Program special project competitive grants and will make the awards before the end of this fiscal year. State energy offices and state code authorities will administer the awards.

The department has also provided technical assistance to several states to upgrade their building energy codes. New York, for example, recently adopted a building code, which will go into effect in July and is expected to save $46 million in energy costs per year.

Improving the energy efficiency of new and renovated homes, commercial and institutional buildings saves consumers and the government money and decreases business operating costs.

DOE's investment in upgrading building energy codes has improved the energy efficiency of nearly three billion square feet of new commercial floor space and nearly four million households, and saved consumers an estimated $4.2 billion, enough to provide the energy requirement of more than three million homes for a year. For every dollar spent, the Building Energy Codes Program yields more than $105 in annual energy savings.

For a list of the grants being awarded, information on the State Energy Program and for state energy office contacts, please visit http://www.eren.doe.gov/buildings/state_energy/ or call 1-800-DOE-3732.

ANSI and ICC Partner on Distribution of International Codes

The American National Standards Institute (ANSI) and the International Code Council (ICC) announced the signing of an agreement that granted ANSI the rights to distribute ICC's International Codes via the ANSI Online Electronic Standards Store (webstore.ansi.org) beginning in May 2002.

Initially, ANSI will offer a total of 14 ICC codes and standards in PDF format for users to purchase and download from the ANSI site. This number will increase with ICC's release of new codes and standards. The offering includes such titles as the 2000 *International Building Code*, 2000 *International Residential Code for One- and Two-Family Dwellings*, 2000 *International Plumbing Code*, 2000 *International Fire Code* and the new 2001 *ICC Performance Code for Buildings and Facilities*.

"ANSI is committed to the delivery of timely, value-added products and services to both private- and public-sector interests in the standards community. We are pleased to partner with member organizations such as the ICC to make their standards more widely accessible. Our goal is to offer all facets of the building industry the documents that they need and use most often," states Bob Feghali, ANSI vice president of business development and chief information officer.

For more information, visit the ANSI webstore at http://webstore.ansi.org.

ICMA Supports ICC Efforts

The following is a letter written by board members of ICMA's Governmental Affairs and Policy Committee to its members after a meeting with representatives from NFPA and ICC. The meeting was in regards to proposed building code standards.

Dear Members:
In January 2000, the International Code Council (ICC) released its model building code. The National Fire Protection Association (NFPA) has drafted a building standard (NFPA 5000) that will go to an advisory vote before the NFPA membership in late May. If NFPA 5000 receives a majority vote of NFPA members assembled, it will then go to the NFPA Standards Council for final action in July 2002.

Earlier this spring, representatives of ICC and NFPA appeared before ICMA's Governmental Affairs and Policy Committee (GAPC) to compare and contrast their respective efforts in the area of building codes. Based on the discussion—and previous discussions individual GAPC members had with the building officials in their communities—the members of the GAPC reached a consensus to support the efforts of the ICC. The GAPC did so for a number of reasons. Key among these was that ICC's model building code was developed primarily by the building officials and code enforcement officers employed by cities and counties. GAPC members believed that, as public servants under the general direction of city/county managers, local building officials have as their primary concern the broad general interest of local governments and the citizens they serve. In contrast, GAPC members expressed concern that the NFPA process was more susceptible to being shaped by narrow special interests.

It is important to recognize that model building codes or standards can be referenced in state legislation, state regulations, etc., and can create mandates on local governments. Thus, GAPC continues to urge managers to discuss this issue with their chief building officials. We also continue to encourage ICMA members to bring this issue to their local elected officials, state municipal leagues, state county associations, and national organizations representing local governments.

Kevin O'Rourke	Tom Fountaine
Chair, GAPC	Vice-Chair, GAPC
City Manager	Borough Manager
Fairfield, Calif.	Hollidaysburg, Pa.

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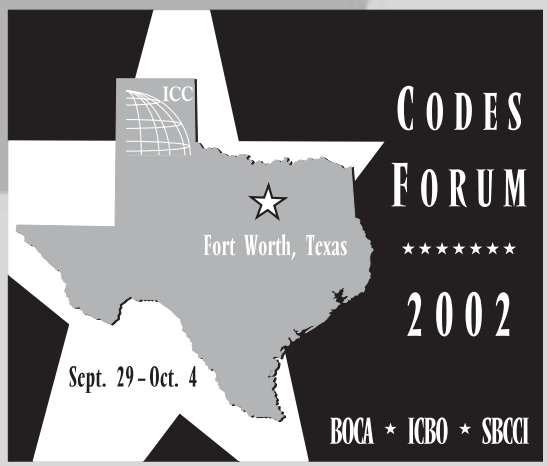

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ASHRAE Encourages Adoption of Standard 90.1 In Model Energy Codes

ANSI/ASHRAE/IESNA 90.1-2001, Energy Standard for Buildings Except Low-Rise Residential Buildings, which provides the minimum requirements for the design of energy efficient buildings, incorporates 34 new addenda. The standard is written in mandatory language and is intended for code use.

To promote the widespread use of its energy standard, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is working with several organizations to encourage its adoption in model energy codes. "ASHRAE's policy is to work on a non-exclusive basis with all recognized code organizations to have ASHRAE standards used as widely as possible," Bruce Hunn, ASHRAE's director of technology, said.

Standard 90.1-2001 is expected to be referenced in the 2003 *International Energy Conservation Code* (IECC). The IECC is a model code that may be adopted by code jurisdictions either in the United States or internationally. At the April 2002 code change hearings of the International Code Council (ICC), ASHRAE's proposal that the IECC update its reference from Standard 90.1-1999 to the 2001 standard was approved by the IECC Code Development Committee. ASHRAE also has asked that wording in the "Design by Acceptable Practice for Commercial Buildings" chapter of the IECC be consistent with the 2001 standard. Final action on this proposed change will take place at ICC Code Hearings this fall.

Earlier standards have been referenced for years in the CABO *Model Energy Code* (now known as IECC) and have been adopted by reference by many code jurisdictions. In addition to IECC, ASHRAE is working with other organizations to encourage and facilitate the adoption of the 2001 standard into model energy codes.

"Standard 90.1 is the only commercial building energy standard or code developed under American National Standard Institute consensus procedures," Hunn said. "It also is established as the commercial building reference standard for state building energy codes under the federal Energy Policy Act of 1992."

The DOE currently is evaluating whether to adopt Standard 90.1-1999 as the reference for state energy code stringency. Standard 90.1-1989 is the current referenced standard. In addition to supporting the adoption of its energy standards in model energy codes, ASHRAE urges the direct adoption, by reference, of these standards by state and local code jurisdictions.

ASHRAE, founded in 1894, is an international organization of 55,000 persons. Its sole objective is to advance through research, standards writing, publishing and continuing education the arts and sciences of heating, ventilation, air conditioning and refrigeration to serve the evolving needs of the public.

2002 Calendar of Events

August

18-22	ASCE The World Congress on Natural Disaster Reduction, Washington, DC
20	Publication Date of Public Comments "Final Action Agenda"
23-25	International Association of Fire Chiefs/Fire Rescue International 2002, Kansas City, MO
26-30	ASCE World Congress on Disaster Reduction, Washington, DC

September

9-11	Access Board Meeting, TBD
22-26	IAPMO 73rd Annual Business and Education Conference, Denver, CO
23-24	NMHC Fall Quarterly Meeting, Washington, DC
25-29	NAHB Fall Board of Directors Meeting, Anchorage, AK
29-Oct. 4	ICC Joint Meeting of BOCA, ICBO & SBCCI/ Public Hearings for "Final Action Consideration," Fort Worth, TX

October

1-3	MetalCon International 2002, Rosemont, IL
6-8	PMI 2002 Fall Meeting, Washington, DC
6-8	IFMA's World Workplace 2002, Toronto, Ontario, Canada
11-15	Access Board Meeting, Anchorage, AK

(continued)

2002 Calendar of Events *(continued from page 19)*

20-23 NCSBCS 36th Annual Conference, Louisville, KY
26-31 ASPE Convention & Technical Symposium, Dallas/Ft. Worth, TX
27-30 NAHRO National Conference and Exhibition, Seattle, WA
29-Nov. 2 American Association of Code Enforcement Conference, Chicago, IL
31-Nov. 2 The Remodelers' Show, Indianapolis, IN

November

3-6 ASCE 150th Anniversary Celebration Civil Engineering Conference and Exposition 2002, Washington, DC
9-13 APHA Annual Meeting, "Putting the Public Back into Public Health," Philadelphia, PA
10-11 NEMA Annual Meeting & Leadership Conference, Chicago, IL
11-13 Access Board Meeting, TBD
12-15 International Conference on Disaster Management, Las Vegas, NV
16-20 NFPA Fall Educational Conference, Atlanta, GA

December

3-7 NLC Congress of Cities, Salt Lake City, UT
5-8 CSG 2002 Annual Meeting and State Leadership Forum, Richmond, VA

Codes & Standards Forum is a publication of the International Code Council. *Codes & Standards Forum* appears bimonthly in publications offered by the three members of the ICC: BOCA, ICBO and SBCCI. The International Code Council, established in 1994, is a nonprofit organization dedicated to developing a single set of comprehensive and coordinated national codes.

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