January 3, 2005

ICC CODE TECHNOLOGY COMMITTEE
DRAFT MEETING MINUTES

MEETING #4

December 1-2, 2005
Excalibur Hotel & Casino
Las Vegas, NV
(702) 597-7777 [www.excalibur.com]

Thursday, December 1: **8:00 a.m. – 5:00 p.m.**
Friday, December 2: **8:00 a.m. - 5:00 p.m.**

1.0 Welcome and introductions - Chair Heilstedt

1.1 Call to order

Chair Heilstedt called the meeting to order at approximately 8:10 on December 2nd.

1.2 Introduction of committee/attendees

Members present: Shahriar Amiri, Carl Baldassarra (Vice Chair), Paul Heilstedt (Chair), Steve Jones, Ron Nickson, Robert Salvaggio, Jeff Tubbs (alternate to Meacham), Marsha Mazz

Members absent: Marty Conant

Staff liaison: Mike Pfeiffer

Attendees: A list of attendees is provided at the end of these minutes

2.0 Approve agenda

Motion/second/approved (unanimous)

3.0 Approve minutes of September 22-23, 2005 meeting

Motion/second/approved (unanimous)

4.0 Election of Chair/Vice Chair for 2006

Two motions/second/approved (both unanimous) for:
Chair: Paul Heilstedt
Vice Chair: Carl Baldassarra

5.0 Climbable Guards

5.1 Climbable Guards Study Group Presentation

CTC member Ron Nickson and chair of the study group briefed the CTC on the conference calls held in November: three study group conference calls; and two conference calls held by a task force of members of the study group. The study group was investigating potential code language that would identify design criteria for "climb resistant" guards. This was followed by a face-to-face meeting of the study group in Las Vegas on November 31st.

5.2 Working Meeting

Ron presented the following potential code changes (based on the upcoming 2006 IBC) to the CTC as a point of discussion:

1013.3 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of ~~34 inches (864 mm). From a height of 34 inches (864 mm) to~~ 42 inches (1067 mm) above the adjacent walking surface~~s, a sphere 8 inches (203 mm) in diameter shall not pass~~.

Exceptions: No change

1013.7 High elevation guards. Guards on the open sides of landings, walkways, balconies or porches, where the walking surface is more than 16 ft (4.8768 m) above the walking surface or grade below, measured within 42 inches (1067 mm) horizontal from the edge of the elevated walking surface, shall have a top inside edge with a minimum radius of 1-1/2 inches (38 mm) or a equivalently non-graspable profile or a minimum 5 inch (127 mm) inward horizontal offset, measured from the base of the infill to a point 42 inches (1067 mm) above the adjacent walking surface. No infill elements may break the plan of the angle that establishes the off set.

Exceptions:

1. Guards where the infill consist of only vertical infill balusters, starting from a horizontal point no higher than 4 inches (102 mm) above the walking surface and terminating at a point no lower than 39 inches (990 mm) above the walking surface. Solid surface and mesh infills are NOT exempt from Section 1013.7.
2. Guards in Group R-3 occupancies.
3. Guards on the interior of individual dwelling units in Group R-2 occupancies.
4. Guards in areas which are not open to the public within occupancies in Group I-3, F, H or S.
5. Guards in Section 1013.4 Screen porches.
6. Guards in Section 1013.5 Mechanical equipment
7. Guards in Section 1013.6 Roof access.

Issues raised with the proposed text:
- Basis for 16' threshold?
- Interpretation issues relative to measurement of the 5" offset
- What is meant by a solid surface guard in exception 1?
- Basis for occupancy exceptions

Ron noted that the study group felt that regardless of what is considered as proposed changes, that some form of testing is required to demonstrate the effectiveness of the guard configuration before any such language be considered. The study group was going to re-convene later in the day.

Elliott (Steve) Stephenson presented two handouts:
"An investigation of the performance of guards having various sizes of top rails projecting from a guard's accessible side"
This handout summarized an investigation of children climbing a guard with horizontal rails and a top rail of different larger size configurations to determine the impact on climbabilty such a top rail poses. The conclusion reached was that the top rail had no impact, the children could climb to the top of the guard.

"Proposed revisions of chapters 2 of both codes"
Included are proposed definitions for "foot holds" and 'climbable guards", with corresponding text limiting the locations of climbable guards based on occupancy and height above floor/grade.

Steve felt that the time was now to propose code changes and that the CTC should not wait. He further noted that the threshold in the proposed text should be 14', measured to the top of the guard, based on: 10' to underside of floor; 1' floor construction; 3' guard.

Doug Bracken with NOMMA presented 3 Power Point presentations, going back and forth between files:
"Studies on Falls"
This presentation cited specific studies dealing with falls and fall injuries.

"Railing Configurations"
Slides of numerous and varied guardrail configurations.

"Childhood Falls from Balconies and Railings- Media Research"

An investigation of news and web stories related to children falling balconies and railings.
Jake Pauls noted the absence of data typically yields a conservative approach to developing regulations. He felt that the effort lacked qualified experts in this field of study.

The CTC noted the need for the study group to bring a work plan back to the CTC. At this point in the CTC meeting, the CTC went on to the next agenda item and the study group reconvened their meeting. Upon conclusion of the study group meeting, the study group reported their findings to the CTC.

Ron Nickson reported that the study group concluded that there is a need for testing of guard configurations to determine which are climb resistant and that the study group will come back to the CTC with a plan.

Jake Pauls presented a Power Point presentation:
"Remarks by Jake Pauls, CPE, to ICC-CTC, December 2, 2005"
Jake's presentation is primarily in response to any proposed testing by the study group. He notes the need to have qualified ergonomists involved in any type of study that is to be undertaken. There needs to be an institutional review board (IRB). He also suggests that there may be less expensive ways to develop the needed data such as literature reviews by experts in the field - an analytical approach versus a physical approach.

A motion was made and seconded on the following:

> Limited physical testing to evaluate ideas to make guards more climb resistant, using configurations determined by the study group, to fabricate samples.
>
> Conduct testing by an independent third party and develop recommendations to report to the CTC.
>
> Basic categories of guards to begin with
> Flat surfaces
> Plain vertical
> Ornamental patterns
> Plain horizontal

An amendment was made a second as follows:

> ~~Limited physical testing~~ Encourage the creation of a plan to include a protocol, identification of researchers and goals associated with specific testing to evaluate….[remainder unchanged]

Issues brought up in discussion:
- Cost versus usefulness of resulting data
- Need a plan before we can proceed
- Issues of human subject testing and the need for an IRB
- Need goals and objectives to evaluate

After further discussion, the motion was withdrawn. The CTC directed the study group to come up with a plan to address this area of study.

6.0 Day Care/Adult Care/Assisted Living

6.1 Working Meeting

CTC facilitator Steve Jones presented a Power Point entitled "Day Care/Adult Care & Assisted Living Facilities – Objective Overview"

Steve noted the inconsistent use of terms in the IBC as well as the use of undefined terms in the IBC dealing with this subject matter. The genesis of the 16 person threshold in the IBC for Groups I-4 and R-4 seems to be have been based on an analysis that 98% of the US population has less than or equal to 16 occupants living in their home. The presentation included a comparative matrix for the IBC occupancies affected. Steve cited the need for the code to have and use a consistent set of discriminators in order to

regulate such occupancies. The discriminators noted were:
- Amount of time care was given (ie, less than 24 hours vs 24 hours)
- Age of occupants who were the recipients of the care
- Whether or not the occupants were capable of responding to an emergency
- Number of occupants

A study group was created, consisting of: Steve Jones (chair); Shahriar Amiri, Dave Collins; Marsha Mazz; and Paul Tellez. The focus of the study group being a refinement of the parameters listed above – not necessarily based on the current code provisions but rather how the issues should be addressed.

7.0 Balanced Fire Protection

7.1 Working meeting - code related specific subjects by interested parties, if any

Members in attendance voiced the concern that absent a methodology and well defined goals and objectives, it was difficult to bring forth a code issue as directed in the last meeting due to the fact that anyone wishing to bring something forward is not sure exactly what the CTC is looking for as far as documentation and how the documentation will be evaluated.

It was further offered that at the Detroit Final Action Hearings, testimony on certain code changes stated that the disposition of the code change should be held until the CTC had deliberated as the issue may fall under this area of study.

Examples of possible code issues that the CTC could investigate were recent code changes submitted by NASFM on select entries of the height & area table and roof vents.

A motion was made/seconded/ approved (7-2) to form a study group to evaluate the type of issues that need to be considered in a holistic balance fire approach. The study group was open to anyone who wanted to participate. It would be chaired by CTC member Brian Meacham. It was noted that this activity would still allow for anyone to bring forth a balanced fire protection code issue to the CTC even if the study group has not completed its objective.

8.0 Review of NIST WTC Recommendations (Time specific start – 8:00 am, Friday, 12/2)

8.1 Working Meeting (including participation from ICC Terrorism Resistant Building Committee)

Dick Bukowski with NIST offered a brief Power Point presentation. He cited the limits of NIST's authority and NIST's role in building regulations – specifically as a non-regulatory agency, NIST is required by statue to make recommendations for safety improvements to be considered by regulators. Then he went on to broadly speak to the WTC investigation and the NIST/NIBS "straw man".

Rich Schulte posed questions of;
- How this issue was being conveyed by members of Congress to the public and that their may be a perception that whatever comes out of the NIST investigation would be included in the codes.
- Basis for the recommendations. Is there a fire problem in high rises?

In response to the question of the impact of the NIST recommendations on the codes, it was noted that the results of this report will be treated no differently than any other code related issues relative to a submittal to the ICC Code Development Process.

Following the NIST presentation, each of the 30 items in Chapter 9 of the NIST WTC report were discussed. References are made to the November 29, 2005 "Strawman Code Change Proposal Prepared by NIST for the NIBS/MMC Committee to Translate the NIST WTC Investigation Recommendations for the Model Building Codes" ("NIST Strawman"). Reference to the "TRB" indicates the view of the ICC Ad Hoc Committee on Terrorism Resistant Buildings who met on December 1 and reported their findings to the CTC at the CTC meeting.

#1. Progressive collapse

Discussion: Section 1.4 of ASCE 7 includes performance language, however this language is vague. It was

noted that there is an ASCE committee studying this issue however an update of ASCE would not occur until around 2010 (5 year cycle after the 2005 edition).

NIST Strawman: An assessment of the language requires input from structural engineering community. Are there tools available to perform such an analysis?

Outcome: There is an opportunity to possibly submit something to the IBC in the interim while ASCE reviews the subject and possibly updates the standard. TRB will develop proposed text based on British practice. TRB to submit to CTC. In the interim, the definition of "Primary Structural members" may be of value in conjunction with NIST Rec #7.

Time frame: 06/07 cycle

#2. Wind tunnel test standard
Discussion: Status of completion of the ASCE standard needs to be determined. Depending on the size and shape of the building, prescriptive wind loads in the code may differ from the loads determined in accordance with tunnel testing by as much as 40%.

NIST Strawman: An assessment of the proposed thresholds for applicability of the wind tunnel test will require input from the structural engineering community.

Outcome: CTC will consider proposing a reference to the standard if the standard is completed in advance of the 2006 Code Development Hearing (Sept/2006). The mandatory/voluntary reference to the standard needs to be addressed.

Time frame: 06/07 cycle

#3. Tall building sway criteria
Discussion: Intent is to achieve additional structural robustness in the structural frame by limiting the drift. NCSEA is investigating.

NIST Strawman: An assessment of and the need for the proposed drift threshold of 1/300 will require input from the structural engineering community.

Outcome: Limiting wind drift, similar to that currently regulated in the IBC for seismic drift, is worth pursuing in the IBC. CTC will investigate, provided structural input is secured.

Time frame: 06/07 cycle

#4. Fire ratings and height & area
Discussion: IBC treats all high rise buildings basically the same in Section 403 with a minimum TOC of Type I. 2006 IBC includes more restrictive TOC for high rises over 420 based on G55-03/04. The code should differentiate between a 75' tall building and a 1000' tall building. This item is clearly related to the Balanced Fire Protection area of study- however, this needs to be looked at collectively as a high rise package and not singular code issues.

NIST Strawman: It was noted that it was not the intent to propose this table into the codes. It is more of a road-map, outlining related NIST recs dealing with high rises. The loss history does not warrant wholesale changes. Proposed text to 714.2.6 for spray applied should be considered within context of NIST Rec #6. Proposed bond strengths require justification. The fire ratings which are tied to evacuation time (buildings > 840') are related to the performance goal of burnout which is addressed in NIST Rec #8.

Outcome: See NIST Recs # 6 (spray applied fire resistive materials) & #8 (burnout relative to fire ratings). TRB to investigate Recs #6 and #8.

Time frame: Long term, except for #6 and #8

#5. Update ASTM E119
Discussion: Determination of reliability of fire test protocol is a standardization related issue.

NIST Strawman: See discussion

Outcome: No action to be taken by CTC

Time frame: None

#6. Spray applied fire resistive materials
Discussion: Fire protection contractor certification programs are being developed. Key issues are impact of primer or lack there-of on the adhesion properties and the accuracy of field inspections.

NIST Strawman: Consider proposed text to 714.2.6 in NIST Rec #4 in this recommendation.

Outcome: TRB to develop language to enhance the special inspection requirements related to sampling, frequency, timing (relative to other trades finishing their work and possibly affecting the in-place conditions of the spray applied fire proofing) and the like. TRB to submit to CTC.

Time frame: 06/07 cycle

#7. Fire rating of structural frame
Discussion: Table 601 coupled with footnote "a" addresses the structural frame rating requirements. As a footnote, the requirement lacks visibility in the code.

NIST Strawman: No strawman other than proposed definition in NIST Rec #1 ("primary structural members") which may have some application in the IBC within the context of NIST Rec #7.

Outcome: CTC to evaluate NIST #1 proposed definition and consider relocation/duplication of footnote from Table 601 to Section 714 and reformat the section.

Time frame: 06/07 cycle

#8. Burnout w/o collapse
Discussion: Related to NIST Rec #4 as far as fire ratings and the proposal that the fire ratings be tied to the evacuation time for buildings taller than 840'.

NIST Strawman: See high rise fire ratings in NIST Rec #4.

Outcome: TRB to develop language to address burn-out related to fire ratings and evacuation time. TRB to submit to CTC.

Time frame: 06/07

#9. Performance standards for real fire conditions
Discussion: Chapter 17 of the ICC performance Code addresses fire impact management. Development of standards to address real building fire conditions is a standard's related issue.

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#10. Develop new fire resistive coatings

Discussion: Development of new and innovative products is an industry issue. Any obstacles in the Codes should be identified and addressed.

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#11. Advanced high performance materials
Discussion: Evaluation of the performance of materials under fire conditions is an industry issue. Obstacles to the acceptance of new materials must be identified.

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#12. Performance and reliability of active fire protection
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

#13. Fire alarm and communication systems
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

#14. Control panel information
Discussion: See NIST Rec #13

#15. Off site emergency responder information
Discussion: See NIST Rec #13

#16. Occupant preparedness - public education programs
Discussion: IFC 404.2 mandates fire safety and evacuation plans. However, not all AHJ's adopt the IFC. The IBC should adopt, by reference, the emergency preparedness and planning provisions of the IFC. Public education is outside the scope of the codes.

NIST Strawman: None

Outcome: CTC to consider proposing a reference to the IFC from the IBC. CTC to investigate, in cooperation with the International Association of Fire Chiefs (IAFC).

Time frame: 06/07 cycle and long term

#17. Tall building egress/evacuation
Discussion: ASME is studying the issue of occupant evacuation via elevators in the ASME – A17 Task Group on Use of Elevators by Fire Fighters and A17 Task Group on Use of Elevators for Occupant Egress. Status of effort not certain. This recommendation in conjunction with #18 includes multiple issues, many of which can be evaluated individually – some in a more timely fashion than others. Separation of stair towers (not just separation of entrance doors to stair towers) is viewed as unique to terrorism and the possibility of something like a bomb taking both stair enclosures out of service. Code change E51-04/05 was submitted last cycle, proposing uniform provisions for marking of treads. It was noted this was not a mandate for marking of treads.

NIST Strawman: A position was noted that a 56 inch minimum stair width (1009.1) is an absolute minimum. It some cases, a wider stair is warranted. The 2 psi (approx 300 psf) stairwell hardening design load in proposed 1019.x requires substantiation.

Outcome: TRB to develop language to address counterflow – and the feasibility of requiring an extra stair for buildings of certain minimum heights. TRB to also investigate the feasibility of tread markings and the separation/hardening of stair towers. It was noted that separation/hardening of stair towers may be considered unique to iconic buildings, as such they may be pursued in a proposed appendix. TRB to submit to CTC. CTC to investigate the possibility of translating ASME work product to-date into possible code changes.

Time frame: 06/07 and long term

#18. Exits – remoteness, robustness, signage
See NIST Rec #17.

#19. Emergency information communication
Discussion: Communication between owners and emergency responders is not a code issue

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#20. Innovative emergency evacuation technology
Discussion: Proposals have been considered in the NFPA 5000 and 101 process. New York City is looking into innovative emergency evacuation technologies. This is an industry driven issue – CTC will offer an opinion on such technology, if asked.

NIST Strawman: None

Outcome: No action to be taken by CTC other than noted above

Time frame: None

#21. Hardened elevators
Discussion: Defer to the results of the ASME – A17 Task Group on Use of Elevators by Fire Fighters and A17 Task Group on Use of Elevators for Occupant Egress.

NIST Strawman: A dedicated elevator for exclusive use of the fire service may not be preferred as maintenance issues arise. However, an elevator which can be withdrawn from service for fire service use while others remain in service for evacuation needs review.

Outcome: CTC to review results of ASME when available.

Time frame: Long term

#22. Emergency communication systems
Discussion: Radio Signal Amplification Devices ("repeater systems") technology, installed in buildings which amplifies fire/police radio frequencies is available and in use by some jurisdictions.

NIST Strawman: There is the question of whether or not this is a building/fire code related issue.

Outcome: CTC to investigate the viability of a code change to either the IBC or the IFC.

Time frame: 06/07 cycle

#23. Emergency responder procedures
Discussion: Video cameras in stairs used for security and monitoring evacuation have been in use in England. Questions arose relative to the ethical use of such cameras relative to privacy as well as the possibility for building owner liability where the presence of the camera lead the occupant to believe that the monitoring function was intended to provide for occupant security while in the stair.

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#24. Command and control systems for large scale building emergencies
Discussion: Section 509 of the IFC includes requirements for fire command stations in high rise buildings.

NIST Strawman: None

Outcome: TRB to review IFC 509 to determine if it needs to include additional parameters, such as information transfer, monitoring, and location/hardening of the command center, to implement an effective command and control system. TRB to submit to CTC.

Time frame: 06/07

#25. Volunteer code compliance
Discussion: Not a code related issue

NIST Strawman: None

Outcome: No action to be taken by CTC

Time frame: None

#26. Egress and fire protection in existing buildings
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.

Time frame: 06/07 cycle

#27. Document retention over life of building
Discussion: Due to the nature of performance designs, some jurisdictions require this information for buildings designed using the ICC Performance Code. If there is a need to locate the design records, they can typically be secured without a code mandate.

NIST Strawman: The proposed language raises questions of enforcement and the ability of the AHJ to require the owner to maintain the records.

Outcome: No action to be taken by the CTC.

Time frame: None

#28. Clarify role of Design Professional in Responsible Charge
Discussion: Section 103.3 of the ICC Performance Code includes requirements which differentiate the responsibilities of: the owner; the design professional; and special experts. This is also an issue that is under the purview of state registration laws and practice acts.

NIST Strawman: None

Outcome: No action to be taken by the CTC.

Time frame: None

#29. Continuing education –cross training
Discussion: Not a code issue

NIST Strawman: None

Outcome: No action to be taken by the CTC.

Time frame: None

#30. Short course/web based training
Discussion: Not a code issue.

NIST Strawman: None

Outcome: No action to be taken by the CTC.

Time frame: None

9.0 Resume outstanding agenda items 5, 6, or 7 (if any)
None

10.0 Old business
None

11.0 New business
None

12.0 Review/Update CTC Work Plan
See agenda item 13.

13.0 Future Meetings

13.1 CTC Meeting #5: February 2-3, 2006 in Orlando, Florida
CTC Meeting #6: March 9 – 10, 2006 Chicago, IL
CTC Meeting #7: July 27 – 28, 2006 Washington DC
CTC Meeting #8: October/2006. Dates and location TBD. It was noted that the Inter-Jurisdictional Regulatory Collaboration Committee (IRCC) is meeting on October 16-18.
CTC Meeting #9: December/2006. Date and location TBD.

13.2 Identification of Meeting #5 agenda
Areas of study, in this order: Day Care; Climbable Guards; NIST WTC Recommendations

14.0 Adjourn

Chair Heilstedt adjourned the meeting at approximately 4:45 on Friday, December 2nd.

ICC Code Technology Committee

MEETING #4

December 1-2, 2005
Excalibur Hotel & Casino
Las Vegas, NV
(702) 597-7777 [www.excalibur.com]

List of Attendees

A.J. Cheponis, SMA
Allison Crowley, NASFM
Augie Sisco, NAATMM
Bill Connolly, Director, Division of Codes and Standards New Jersey Department of Community Affairs (TRB)
Bill Johnson, D.H.I.
Bob Lee, Town of Cave Creek
Bob Weber, R.D. Weber & Assoc.
Brian Maltby, IAFC
Dan O'Brien, Universal Building Systems, Inc.
Dan Smits, Calumet City Fire Dept. (TRB)
Dave Frable, GSA
David Cooper, Stairway Manufacturers Assoc.
David Dratnol, Isolatek International
Derek Horn, City of Phoenix (TRB)
Diana Hanson, NADRA
Doug Bracken, Wiemann Iron-NOMMA
Ed Estes, NAATMM
Edmund Goodfield, Building Inspection Underwriters Inc. (TRB)
Elaine Thompson, Allied Tube
Elliot Stephenson
Ernie Ralston, Feeney Wire Rope
Gabriel Palacio, Asian Ornamental Iron
Gene Garrett, Regency Railings Inc.
Hubert Dudley, NFCA
Jake Pauls, Consulting Services in Building Use and Safety
Jason Thompson, NCMA
Jeff Inks, NAHB
Jim Messersmith, PCA
Jimbo Schifiliti , Fire Safety Consultants, Inc. (TRB)
John Battles, ICC (TRB)
Kevin Conley, L.J. Smith Stair Systems
Kevin Kelly, NFSA
Lanny McMahill, City of Phoenix (TRB)
Larry Felker, Belimo Air Controls
Larry Perry, BOMA
Luke Woods, W.R. Grace
Mike Fischer, WDMA & Door Safety Council
Ozzie Mirkhah, IFAC-FLSS
Pat McLaughlin, McLaughlin & Associates
Ray Kechely, Ultra-Tec Cable Railings, The Cable Connection
Rich Bukowski, NIST
Richard Loyd, Steel Tube Institute of N.A.
Robert Polk, NASFM
Richard Schulte, Schulte & Assoc.

Rick Thornberry, The Code Consortium, Inc.
Robert Wills, AISI
Ruben Grijalua, California SFM/NASFM
Sam Francis, AF&PA
Sami Dahdal, Sams Iron Works
Stan Hathorn,, Vinyl Fence Deck Rail Assoc.
Steve Leady, SMA
Thomas Zuzik, Artistic Railings Inc.
Tim Moss, NOMMA
William Koffel, Koffel Associates Inc.