International Code Council

<u>CONSENSUS COMMITTEE ON HURRICANE RESISTANT CONSTRUCTION</u>

(IS-HRC)

Meeting #4 – May 2-3, 2004

The Westin Atlanta Airport – Atlanta GA.

MINUTES

I. CALL TO ORDER

The Chairman called the meeting to order at 8:00 AM. The Chairman welcomed everyone and self-introductions were made. An attendance list was provided for the committee and guests to sign.

The committee had a moment of silence in memory of Jim Delahay who passed away on April 16, 2005. He was an Alternate Member representing the Structural Engineers Association of Alabama. Jim was a valuable member of this committee and his leadership, contributions and friendship will be missed.

II. APPROVAL OF AGENDA

The agenda contains two item **VI.** The second item **VI** is to be renumbered to **VII** and the subsequent items renumbered. The meeting agenda was approved unanimously with the changes as noted.

III. ATTENDANCE

<u>May 2</u>

The review of the signed attendance list showed that a quorum was present. Seventeen committee members, ten guest and two ICC staff members were present.

<u>Members present:</u>

Charles Anderson
Sheila Blake
Ralph Dorio
Bradford Douglas
Fayez Fanik
Dennis Graber
Dale Greiner
Eric Haefli
Marcelino Iglesias
Joseph Knarich
Medard Kopczynski
Stephen Skalko
Eric Stafford
Gary Walker
George Wiggins
Robert Wills
Frank Zuloaga

<u>Guests present:</u>

Ronald Barnett
Katherine Berkenbile
Tommy Hagood
Joe Hetzel
Edward Keith
Bob Kelly
Robert Lutz
Frank O'Neill
Randall Shackelford
Jason Smart

<u>ICC Staff present:</u>

Larry Franks-Secretary
Dave Bowman – Manager of Codes

May 3
The review of the signed attendance list showed that a quorum was present. Fifteen committee members, nine guest and two ICC staff members were present.

Members present:	**Guests present:**	**ICC Staff present:**
Charles Anderson	Ronald Barnett	Larry Franks-Secretary
Sheila Blake	Katherine Berkenbile	Dave Bowman – Manager of Codes
Ralph Dorio	Tommy Hagood	
Bradford Douglas	Joe Hetzel	
Fayez Fanik	Edward Keith	
Dennis Graber	Robert Lutz	
Dale Greiner	Frank O'Neill	
Eric Haefli	Randall Shackelford	
Joseph Knarich	Jason Smart	
Medard Kopczynski		
Eric Stafford		
Gary Walker		
George Wiggins		
Robert Wills		
Frank Zuloaga		

IV. MEMBERSHIP

The Secretary announced that the committee is unbalanced at 24 members.

Ms. Judith Stickley, representing the Structural Engineers Association of Alabama, has resigned. Jim Delahay was the Alternate. At this time the Structural Engineers Association of Alabama is not represented on this committee.

We now have 8 General, 7 User, and 9 Producer voting members.

There are several Alternate and Member applications pending which will be considered at the next ICC Standards Council meeting.

V. APPROVAL OF MEETING #3 MINUTES – FEBRUARY 12-13, 2005

Under **Task Group Reports –Fenestrations – Dale Griener (Chairman)**
In the second line, change "….rain driven wind…" to read "…wind driven rain…"
In the fourth line, change "requirement" to "requirements".

The minutes of the meeting #3 – February 12-13, 2005 was approved unanimously with the corrections as noted.

VI. MATERIALS

A. Discussion/update on materials format issue. – Dave Bowman (See Attachment A)

Dave Bowman, ICC Manager of Codes, facilitated a discussion of use of material developed by industry and includes in individual standards.

The committee was asked to provide the ICC Standards Council an explanation of the material format conflicts and to request guidance from the Standards Council.

The committee decided that four options were available and to request guidance from the Standards Council as to which option this committee should pursuer.

See **Attachment A** for a summary of the discussion and the committee actions.

VII. DEVELOP DRAFT STANDARD

A. Review and comment on Working Draft Version 1.0

The committee reviewed and commented on the Working Draft Version 1.0. The comments by the full committee will be utilized by each task group for inclusion into Draft Version 1.1.

The committee decided the definitions within the standard will be in Chapter 1 and should be correlated with the IRC and IBC definitions. A section is to be added to section 104 to state that roof coverings are to be designed based on wind pressures in Zone 3.

Additional information is needed in Chapter 2, Loads. Clarification is needed for the units in the tables. Also, the component and Cladding tables should address large effective areas. The table should address areas large enough for garage doors. The table in ASCE 7 has ranges from 10 – 500 square feet for walls and 10 -100 square feet for roofs.

The foundation task group is having difficulty developing a reasonable foundation design for wind speeds 120 mph and higher. Dennis Graber stated that Jim Harris of ASCE 7 wind committee has offered to work with Kelly Cobeen to assist in solving this problem. The committee decided to allow internal shear walls to be considered for the foundation designs.

The roofing chapter needs to add reference standards to the metal accessory section and some corrections needs to be made to Table 908.5.1.

The comment on the fenestration chapter was for the task group to review and delete any items already covered by the IRC.

The committee adjourned at 5:00 pm on May 2. The committee reconvened at 8:00 am on May 3. There were fifteen members, nine guests and two staff members present.

B. Breakout - (8:00 am – 10:00 am) Task Groups to continue work, review assignments/progress, and make new assignments as required.

It was decided that only the General, Foundations, Masonry, Fenestration and Roofing Task Groups would need the breakout session. The remaining Task Groups will assist the others as needed.

C. Report to full committee- Discuss and Review work from breakout session.

Task group Reports

General – George Wiggins (Chairman)

Task group meeting participants included: George Wiggins and Sheila Blake.

The General Task Group amended the draft of Chapter 1 to include the main committee's comments.
(See Attachment B)

Foundations - Shelia Blake for Kelly Cobeen (Chairman)

The task group made progress toward development of a reasonable foundation size for high wind. A reasonable foundation size for wind speed of 120 mph, exposure C has been achieved.
(See Attachment C)

Masonry – Dennis Graber (Chairman)

Task group meeting participants included: Dennis Graber, Ron Barnett, Katherine Berkenbile, and Tommy Hagood.

The task group needs input for connectors to the other materials. Randall Shakelford of Simpson Strong Tie and Robert Lutz of USP Structural connectors have joined this Task Group to help in this area.

The masonry chapter will only include wall design and the connections to other materials. Interface with other materials will be by reference to the appropriate material sections.

Ron Barnett will develop requirements for ACC to be included in the standard.
Chip Clark is developing the clay masonry requirements.

We are proceeding based on referencing the TMS Standard. We have an outline developed and should have something for review by the next meeting.

Fenestrations – Dale Griener (Chairman)

(See Attachment D)

Roofing – Gary Walker (Chairman)

(See Attachment E)

VIII. REVIEW WORK PLAN

The work plan was reviewed and no changes are to be made at this time. The target date of March 2006 to submit proposal(s) to the I – codes will remain regardless of the Standard Council's decision. If the decision is to update the IRC, the technical work to achieve must continue on schedule. The work plan will need to be revised to reflect this.

IX. NEXT MEETING / LOCATION

Previously, the committee had voted to have the July meeting in Puerto Rico. However, due to the cost of travel and budget constraints the committee will not meet in Puerto Rico.

Several locations were suggested and it was decided that staff would check with ICC travel Services for locations that meets the committee's criteria of low cost, ease of travel and ground transportation. Staff will poll the committee to determine the next location.

The next meeting will be the week of July 15.

X. ADJOURN :

Chairman Kopczynski adjourned the meeting at 10:30 am on Tuesday, May 3.

ATTACHMENT A

IS-HRC Committee Meeting
May 2 & 3, 2005

Agenda item VI: Discussion of use of materials developed by industry and included in individual standards

Background: The IS-HRC committee was formed for the purpose of writing an ANSI complying consensus standard for prescriptive requirements for construction of residences in high-wind regions (above 110 mph). Essentially, the committee was asked to update existing SBCCI Standard SSTD10 to reflect current wind load criteria and current technology. The committee therefore had 2 parameters to follow:

1. Provide a standard that gave comprehensive requirements for construction in high wind regions, providing a "one-stop shop" for homebuilders.

2. Update the technical requirements for wind to reflect current wind load criteria.

The IS-HRC committee has been dealing with an overarching concern from the very beginnings of the committee regarding how the standard content will be composed with respect to existing and developing separate materials standards that deal with prescriptive methods for residential construction.

At the outset, the committee has attempted to meet its charge, and still meet the request from industry that it should not "reinvent the wheel" and construct technical requirements that have already been completed by the materials groups. ICC expressed its desire that the committee accomplish this by extracting portions of the various materials standards and placing them in the standard, assuming that appropriate copyright releases and permission to use this work could be obtained by ICC from the respective materials groups (i.e. AF&PA, AISI, Masonry, Concrete). Thus, the committee would only need to develop new technical information for construction not covered by the separate materials standards, including roof coverings, fenestration, building appurtenances, interface between different materials, and foundations.

Attempts to excerpt portions of the materials standards in the HRC have proven to be problematic for the committee. Therefore, each of the materials task groups have proposed that the HRC standard simply reference the other materials standards for requirements for design and construction of those respective materials. The committee, however, was concerned that such an approach would not allow the committee to provide the comprehensive, one-stop standard that it was originally charged to write. With this in mind, the HRC committee was asked by ICC staff to provide to the ICC Standards Council an explanation of the conflicts that it has been dealing with, and ask the Standards Council for Guidance. At this time, the HRC committee feels that four options are available to ICC regarding prescriptive requirements for construction in high-wind areas. Following is a list of the options available, and the committee's input regarding the "pros" and "cons" of each of these options.

Discussion of Options
Materials Format/Use

Option 1: Standard technical requirements for wood, steel, masonry done by excerpting provisions from standards.

PROS	CONS
-Work already complete - Accomplishes one stop shop, and IAC recommendations to not reinvent the wheel -Speed in developing the standard, and accuracy of technical requirements -Gives opportunity to customize the ICC std -Provides consistency with industry standards -Cover voids in technical requirements -Usability of document -Separates high wind technical requirements and facilitates utilization of most conservative requirements for wind vs. other loads	- Coordination problems would continue between actions of the committee and the individual standards committee -possible diverging actions in each process -cycles / coordination between cycles - Coordination problems caused by differences in material standards approaches in each document - Technical feasibility–will need to take more from the standard than is apparent at first blush–difficulty in identifying all necessary pieces from the material standard -The material standards cover other loads (snow, eq, etc.) and therefore cannot accurately extract all information – will probably lose some technical requirements and may unintentionally modify original intent – Most legally complex option – Inconsistent application of different material requirements will make the standard a confusing document to use -Different scope of materials documents will make for confusion in writing and application of this standard – Inefficiency in use of person power in developing technical requirements

Option 2: Standard technical requirements for wood, steel, masonry done by referencing provisions from standards.

PROS	CONS
-Provides consistency with industry standards -Speed of standard development and addition of technical advances in the future - More efficient use of person power in development of technical standards - Leave technical aspects of the specific material standard in the hands of most capable individuals - Accomplishes 100% consistency with industry standards - Will fill the voids (foundations, etc.) - Eliminates copyright issues -More efficient for users (i.e a wood frame contractor only needs WFCM and our standard -Will not reinvent wheel/meets IAC request -Standard itself smaller, more affordable - Eliminates scope conflicts and conflicts in technical requirements– will assure that the desires of different materials groups are met -Less intimidating set of requirements -Easier to keep up with different change cycles of each material group	-NOT comprehensive, not one stop shop (We would be departing from the original intent of SSTD10 which was to provide a simple, single document for the common, every day applications) -Concerns that the correct standards are being used - Inconsistency in the audience addressed in each standard/conflict in use - Limited purpose of this standard–why do this instead of simply updating the IRC and referencing the materials standards as the IRC already does (i.e Option 3)? -Duplicative with IRC references already in code. – Could still create conflicts–references will have needed modifications. – Would allow conflicts to continue in areas where multiple materials are intended to be used. – Difficulty of enforcement community professionals to keep up with different technical requirements

Option 3: Abandon development of standard, give the HRC committee a new task to write new IRC provisions to reference material standards, and provide the missing pieces (foundations, etc).

PROS	CONS
-More efficient us of committee–all technical information is already out there. - Fills the missing technical voids -Least legal complexity -Gives individual materials groups the most flexibility (Eliminates the variable for this standard development) -Opportunity to pull together IRC to be comprehensive for all loads -Eliminates a level of interpretation processing -Allows work to be done in stages, if time runs out on work to be completed, the committee could still move forward with much needed upgrades to the IRC	-Fails to provide the one-stop shop accomplished by individual standard -Risky that the committee will be able to accomplish all technical needs in the IRC development process – brings in more political variables – Will require a significant number of changes to IRC – Adds something to IRC that applies to a small geographic part of the country

Option 4: Standard technical requirements for wood, steel, masonry done by creating new tables, requirements.

PROS	CONS
-One stop shop, comprehensive covers all materials -Would allow this committee to adequately address the audience intended – Force standardization of the scope, and tabular basis for requirements	-More work, Duplication of person resources for development that takes time away from development of new work needed -Expertise does not reside within this committee -Invariably, will still need to borrow technical information and will still have copyright issues -Inconsistencies with other standards -More difficulty, more work in updating and still need to coordinate with materials -Introduces conflict with ANSI -Becomes a competing standard.

Additional Suggestion:

The committee also discussed and offered a suggestion that, In conjunction with options 1, 2, or 3, that ICC write a guide–basically to pick up pieces of material standards in a guide that is not referenced in the IRC, this guide would be written in handbook format, providing a discussion of code and standards requirements for each type of material construction.

PROS	CONS
-Would provide a single source/one stop shop -Guide language could be more user friendly for the non-engineering audience -Provides a building safety marketing tool for ICC and materials groups – Fills missing gap in IRC with option 3, and still accomplish that single document source.	-More work, adding another document -More confusion -Not enforceable

The committee does not offer a specific recommendation to the ICC Standards Council, but does offer the order of its preference for each of these options as follows:

1 Option 3, abandon the writing of the standard, and work to update the IRC.
Since this was the committee's first choice, the committee outlined what it thinks the revisions needed to the IRC would be. That outline is attached.

2 Option 1, excerpt materials from other materials standards.

3 Option 2, reference other materials standards.

4 Option 4, create technical requirements for materials anew.

See attached for further development of Option 3.

In addition, the committee voted in favor of the suggestion to recommend that the ICC develop a guide for use in high wind resistant residential construction.

Finally, the Committee voted to recommend to the ICC Council and the ICC Board of Directors that, if the development of the HRC standard is discontinued, that a permanent committee to continue to deal with high wind issues in the codes be formed, to ensure that ongoing changes to ASCE 7 and technology advances are monitored and appropriately incorporated into the IBC and IRC.

Regarding Option 3:

What is needed in IRC?

1. Update for high winds for several systems including :

   a. Foundations
   b. Roof coverings
   c. Fenestration products
   d. Roof components (i.e. vents, penetrations)
   e. Soffits, other architectural attachments/embellishments
   f. External mechanical equipment

2. Combinations of building types – clarify requirements for connections between different materials.

3. Fix code logic that limits use to 110 mph (R301.2.1.1)

4. Add requirements for attached structures

5. More detailed requirements in IRC existing sections to coordinate with referenced standards.

6. Requirements related to open or partially enclosed structures.

7. Review connections requirements and possible update.

8. Step by step design checklist/worksheet to be placed in an Appendix.

ATTACHMENT B

__DRAFT 2

CHAPTER 1
GENERAL REQUIREMENTS
Amended 5/3/05

101 GENERAL

101.1 SCOPE
The prescriptive methods presented in this standard provide wind resistant designs and construction details for one-, two and **three-story** residential buildings of conventional **wood-framed**, concrete, ~~or~~ masonry, **two-story** ~~**cold-formed**~~ **steel frame** construction sited in high wind regions. The requirements are deemed to satisfy the wind load provisions of ~~Section~~ ~~**R301.2.1 of**~~ **the 2006 International Residential Code and 2006 International Building Code** subject to the limitations in generic building geometry, siting location, materials and wind climate set forth herein.

101.2 LIMITATIONS
101.2.1 The provisions of this standard are directed toward insuring structural integrity for resisting wind loads. They do not address requirements for ~~earthquake~~ **seismic** loads, flood loads or gravity loads (other than those specified in Appendix B), or any other, possibly more stringent, design considerations. Where specific construction requirements are not given, appropriate requirements of the **International Residential Code** or International Building Code shall prevail.
101.2.1.1 This standard provides prescriptive wind design requirements for structure types identified in 101.1 which are ~~located~~ geographically located in regions with basic wind speeds up to150. ~~**In determining basic wind speed, local jurisdiction takes precedence over the IRC or IBC.**~~ **Structures located geographically by the IRC or IBC as having a basic wind speed greater than 150-mph shall be designed for wind loads according to ASCE 7.** *(Reason – to identify the limitations to the wind speeds agreed to at an earlier meeting.)*
101.2.2 For buildings outside the range of design parameters, design load criteria, and materials and methods of construction set forth in this standard, the design shall be structurally reviewed for wind resistance by a registered engineer or architect when required by the building official. **Add matrix of limitations based on materials.**

101.3 INTEGRITY OF BUILDING ENVELOPE
Individual elements of a building not in strict compliance with or addressed by this standard may be engineered without requiring engineering for the entire building. Elements which maintain the structural integrity of the building envelope shall comply with **Section R301.2 of the International Residential Code or Section 1609 of the International Building Code**. [Windows and doors that are not addressed in Chapter 6 shall be designed for components and cladding loads of **Section R301.2 of the International Residential Code or Section 1609 of the International Building Code.]** Move bracketed text to Chapter 6.

101.4 ALTERNATE MATERIALS AND METHODS
It is recognized that a large number of alternatives are available to a designer for providing wind resistance. The provisions given are not intended to prevent the use of such alternate materials or methods permitted by **Section R104.11 of the International Residential Code or Section 104.11 of the International Building Code.**

101.5 ITEMS NOT ADDRESSED
Elements and assemblies not specifically addressed by this standard shall be designed in accordance with **Section R301.2 of the International Residential Code or Section 1609 of the International Building Code**.

101.6 DESIGN CONCEPTS

____**101.6.1 Roofs, Ceilings, and Suspended Floors.** These are designed as diaphragms to receive lateral loads from exterior walls (assuming the wind blows from any direction) and to transfer those loads to diaphragm edges where they will be resisted by shearwalls.
101.6.2 Exterior Walls. These are designed to resist wind forces and transfer the lateral loads to diaphragms and to the ground. Exterior walls and foundations are designed to restrain uplift loads received from the roof by means of connected dead loads.

102 DESIGN PARAMETERS

102.1 GENERIC BUILDING GEOMETRY [The general committee agreed that a matrix would be needed to accurately provide details for this section]

AFPA (Jeff Stone & Brad Douglas) submitted the following for inclusion:

If ICC is to used or be in conformance with the prescriptive provisions of ANSI/AF&PA Wood Frame Construction Manual for a new SSTD-10, then the General Building Geometry needs to be updated to reflect the following limitations of the WFCM:

- *Mean Roof Height: 33 ft.*
- *Number of Stories: 3*
- *Building Aspect Ratio: 1:4 and 4:1*
- *Roof Slope: Flat - 12:12*
- *Maximum Building Dimension: ~~80~~ **40** ft.*
- *Wind speed*

The provisions of this **Standard for Residential Structures in High Wind Areas** apply to one-, and, two-story, wood framed, **steel frame,** concrete, masonry and insulated concrete form (ICF) walled residential buildings having the geometry shown in Figures 102A and 102B and **three-story wood-framed**, **steel frame,** concrete or masonry residential buildings having the geometry shown in Figure 102C. They include buildings on pile, stemwall, and slab foundations. They apply to buildings having rectangular and **a combination of rectangular shapes** (Section 105) plan shapes and meeting the following requirements:

1. The building widths are 12'-0" to **40’** ~~60'-0~~" for one-story buildings and 18'-0" to **40’** ~~60'-0"~~ for two-story buildings. Building widths are 18'-0" to **40’** ~~60'-0~~" for three-story concrete or masonry buildings.
2. The maximum building lengths permitted depend on the shear capacities of the roof, ceiling, and floor (two-story buildings) diaphragms.
3. The laterally unsupported floor-to-ceiling height (sidewall height) of each story is limited to a maximum of 20'-0" for concrete or masonry construction and a maximum of 10'-0" for wood-framed, **steel framed** and insulated concrete form (ICF) wall construction. Ceiling height for the first story need not be the same as the second story. Maximum eave height shall be 30'-0" above grade.
4. The roof shape shall be gabled or hipped. Roof framing may be either rafters or metal plate connected wood trusses **steel trusses**. Roof slopes shall be as follows:

Wall Construction Type	Building Geometry	Allowable Roof Slope
Concrete, Masonry, or ICF	Enclosed Building	10° (2:12) - 45° (12:12)
Wood	Enclosed Building	10° (2:12) - 30° (7:12)
Steel	Enclosed Building	**14° (3:12) - 45° (12:12)**
~~Concrete, Masonry, or ICF~~	~~Unenclosed Portions of Building~~	~~10° (2:12) - 45° (12:12)~~
~~Wood~~	~~Unenclosed Portions of Building~~	~~10° (2:12) - 30° (7:12)~~
~~Concrete, Masonry, or ICF~~	~~Unenclosed Attached Structures~~	~~0° (flat) - 30° (7:12)~~
~~Concrete, Masonry, or ICF~~	~~Open Unattached Structures~~	~~0° (flat) - 25° (6.6:12)~~
~~Wood~~	~~Open Structures on Piles~~	~~5° (1:12) - 25° (6.6:12)~~
~~Wood~~	~~Unenclosed Attached Structures~~	~~5° (1:12) - 25° (6.6:12)~~
~~Wood~~	~~Open Unattached Structures~~	~~5° (1:12) - 25° (6.6:12)~~

5. **(a) For wood construction**, eaves at sidewalls may project 4'-0" maximum. Eaves at gable endwalls may project 1'-0" maximum. Eaves of hipped roofs at endwalls may project 4'-0" maximum.

(b) For steel construction, eaves at sidewalls may project 2'0" maximum. Eaves at gable endwalls may project 1'0" maximum. Eaves of hipped roofs at endwalls may project 2'0" maximum.

6. Open structures (carports, porches, and canopies) shall be considered as in one of the three following categories: Under review by a separate task group.

102.2 FOUNDATIONS

102.2.1 **The requirements of this standard apply to buildings supported on the following types of foundations**

(see Figures 102A, 102B, and 102C):

1. **Slab-on-grade foundations,**
2. **Stem wall foundations, cripple wall foundations, crawlspace foundation walls and basement foundation walls, and**
3. **Piles and other foundation types, if an engineered design is provided in accordance with the requirements of Section 310.**

[Note: Other information from 102 moved to 302]

CONCRETE COVER - protective covering of concrete over reinforcing steel.

CONTINUOUS (REINFORCING STEEL) - refers to lengths of reinforcing steel spliced together to act as a single unit, providing an uninterrupted connection capable of developing the full strength of the bar.

DESIGN WIND SPEED - basic wind speed in mph (~~fastest-mile~~**3 sec gusts**) for 50-year mean recurrence interval given in Figure ~~104A~~ [cite accurate wind map in IRC]or as specified by the building official or other authority having jurisdiction.

DIAPHRAGM - a flat structural unit acting like a deep thin beam.

DRAG STRUT - a structural member that transfers axial loads between adjacent shear resisting elements. Bond beams, top plates, joists, girders, and truss chords may be used as drag struts, provided connections at each end of the drag strut are capable of transferring loads (See Section 105).

ENDWALL - exterior wall of a building perpendicular to the roof ridge and parallel to roof rafters or trusses (See Figure 103A).

FACE SHELL - side wall of a hollow masonry unit.

GROUP II, III, and IV WOOD SPECIES - classifications of wood species by specific gravity for the purpose of fastening design. Specific gravities of various species are provided in the American Forest and Paper Association's (AF&PA) National Design Specification for Wood Construction.

Group II Species: species with a specific gravity of 0.49 or greater (Douglas Fir, Southern Pine, etc.)

Group III Species: species with a specific gravity of 0.42 or greater and less than 0.49 (Hem Fir, Spruce Pine Fir, etc.).

Group IV Species: species with a specific gravity less than 0.42 (California Redwood, Western Cedars, etc.)

GROUT - a mixture of cementitious material and aggregate to which water is added to provide desired slump.

COARSE GROUT - a mixture of portland cement, sand, pea gravel and water.

FINE GROUT - a mixture of portland cement, sand and water.

HEADER - see LINTEL.

INSULATED CONCRETE FORM (ICF) - a concrete forming system using stay-in-place forms of rigid foam plastic insulation, a hybrid of cement and foam insulation, a hybrid of cement and wood chips, or other insulating material for constructing cast-in-place concrete walls.

INTERIOR SHEARWALL - a shearwall located in the interior of the building; i.e., not an endwall or sidewall.

LINTEL - a beam placed over an opening in a wall.

MASONRY - a form of construction composed of concrete masonry units or clay masonry units laid up unit by unit and set in mortar.

MASONRY COVER - protective covering for reinforcement consisting of masonry units, grout, or mortar or a combination thereof.

104 DESIGN CRITERIA [NEEDS UPDATE]

104.1 WIND LOADS

The wind loads used in the development of the prescriptive requirements of the standard are based on the ~~Standard Building Code~~ **International Residential Code**, Sections 1606.1 and 1606.2 (Buildings less than 60 ft high). In keeping with Section 1606, the loads used in the design of the various structural systems and elements of the buildings are separated into:

1. the overall (or global) forces used in the design of the MAIN WIND FORCE RESISTING SYSTEMS (MWFRS), and
2. those loads appropriate for the design of fasteners, cladding and elements of the building which must resist the much higher loadings induced over relatively small areas. The latter loads are designated COMPONENT AND CLADDING Loads (C&C).

In Appendix B, Sections B-1 and B-2, each structural system and its components are defined in terms of this classification scheme. For C&C loads, assumed tributary areas are given. Appendix B, Section B-3, discusses the load combinations used in the design of structural assemblages which were designed to resist both MWFRS and C&C loads simultaneously.

104.2 OTHER DESIGN LOADS AND ASSUMPTIONS

See Appendix B.

104.3 DESIGN WIND SPEEDS AND USE FACTORS

This Standard provides prescriptive requirements and other details of construction for buildings sited in ~~three~~ wind ~~climates~~ **regions with wind speeds over 100 mph.**: ~~90, 100 and 110 mph~~. The appropriate minimum design wind speed to be selected for a particular geographical location shall be based on the WIND SPEED MAP given in Figure 104A or as specified by the authority having jurisdiction. In developing the provisions of the Standard, a USE FACTOR of 1.0 was used throughout (~~See Table 1606 of SBC-1994).~~[**Insert appropriate reference in IBC or IRC**]

104.4 Roof coverings – zone 3.

ATTACHMENT C

ICC Consensus Committee on Hurricane Resistant Construction
Foundation Task Group Discussion 5/2/05 & 5/3/05

Task group meeting participants included: Sheila Blake, Marcel Iglesias, Brad Douglas, Bob Lutz, and Joe Knarich

1) **Format for proposed IRC inclusion:** Information should be formatted similar to seismic – incremented by wind speed (versus zones)
2) **Calculations for foundation sizes:** Calculation basis was reviewed, questions discussed. Issues included sources of resisting loads including soil weight and friction or suction, foundation demands due to global overturning behavior versus moment couples at the base of shear walls. Investigation of sources of resistance not currently considered in calculations will be pursued.
3) **ASCE 7 Wind load basis:** Return period of design wind event and use of 0.6 factor on resisting dead load were discussed. Current practice may work if 0.6 factor is backed out. Performance goals under design loads were discussed (no lives lost, keeping roof attached to walls, or avoiding failure).
4) **Need for varying design base on wind speed was decided.** Recommended increments for foundation requirements:
    1. **Standard design 0-**100 & 100-110
    2. **High wind 110 –**120, 130-140, 140-150
    3. **Exposure C 25-**40 degrees excluded from scope
5) **Expected Material Use:** Typical building materials in the highest wind zones were discussed. It was questioned whether wood light-frame is built in 150 mph zones. Special foundation types in high-wind areas were noted (piles, etc.). Slab on grade foundation common up to 120 mph? 150 mph is not an issue with masonry, but requires reinforcing.
6) **Conclusions & assignments:**
    a. Can live with use of 0.6 factor on dead load
    b. Ed Keith will look into soil resistance information
    c. Over 30 foot building width, interior shear wall should be required
    d. Typical plan dimensions 24' by 40' or 24' by 50'
    e. At 140, 150 mph, limit to 2 story
    f. Try to set standard foundation up to 120 mph, exposure C
    g. Repackaging of foundation information is needed to avoid misunderstandings

ATTACHMENT D

FENESTRATION TASK GROUP

Members in attendance:
Dale Greiner—Chair
Eric Haefli
Joe Hetzel
Charles Anderson

Meeting started at 8:30 AM on Tuesday, May 3, 2005.

Discussion and review, requested by the full committee, of the current document incorporated in the ‘working draft’ revealed that the data provided is totally covered by the International Residential Code (IRC).
The task group recommends to the full committee that the focus of the task group be redirected to identifying any perceived holes or missing areas in the IRC with respect to fenestration.
The task group has identified doors and protection in high wind areas as two perceived areas that might be addressed.
The task group will await direction from the full committee based on future direction from ICC and stands ready to contribute.

The task group meeting was adjourned at 9:30 AM.

ATTACHMENT E

Walker Engineering, Inc.

833 Rockingham Road
Birmingham Alabama 35235-2625
205-854-0160
205-854-0160 (Fax)

International Code Council
CONSENSUS COMMITTEE ON HURRICANE RESISTANT CONSTRUCTION
(IS-HRC)

Tentative Minutes for Task Group – Roofing
May 2nd – 3rd, 2005
The Westin Atlanta Airport – Atlanta, Georgia

I. Roofing Task Group

Gary Walker, P.E. – Chairman, Walker Engineering, Inc.
Edward Keith, P.E., American Plywood Association
Jason Smart, Institute for Business & Home Safety
Frank Zuloaga, Miami-Dade Code Compliance Office

II. IS-HRC Direction

After a preliminary review of the 2nd draft of the roof covering chapter, the IS-HRC committee made the following decisions:

1. Develop the prescriptive requirements for Section 501.2.1 **Gutters and leaders**. The proposed table does not provide prescriptive criteria. The prescriptive criteria for gutters and leaders may be deleted. The Task Group has not been successful in getting any information on gutters and leaders to develop prescriptive criteria.
2. Clarify in Section 502.1 that the criteria for roof sheathing is based on minimum required for the roof covering and needs to be verified that the minimum is adequate for the where the basic wind speed the building is located.
3. Provide additional information for Section 504 **Flashing**. If possible include minimum dimensions and drawings.
4. Clarify that Section 506.2 **Structural underlayment** applies to roof coverings that use adhesive or mortar to secure the tile to the building. Since the load path is through the underlayment, the underlayment must serve two functions (1) weather barrier and (2) structural component.
5. Complete the prescriptive criteria for asphalt shingles (Section 507).
6. Clarify in Section 508.4.3 **Mortar attachment** is restricted to the installation of concrete and clay roof tiles on hips and ridges. Limit the installation of the roof tiles

immediately adjacent to hip/ridge tiles installed using the mortar attachment method is to be installed using an adhesive attachment system. This is to limit the movement of the field tiles immediately adjacent to the hip/ridge tiles. The movement of these field tiles may create localized forces on the hip/ridge tiles. These localized forces could break the mortar bond on individual hip/ridge tiles causing at the minimum a failure of that hip/ridge tile. The failure of a single hip/ridge tile may cause the failure of adjacent hip/ridge tiles.

7. Contact Mr. Bob McClure, Metal Construction Association, about information on the prescriptive criteria for metal roof coverings (Sections 509 and 510).
8. The prescriptive criteria for Section 511 **Slate Shingles** may be eliminated. Slate roofing is not a typically used roof covering. Slate roofing is normally used on expense residential construction that will probably be designed. Mr. Gary Walker will contact the slate roofing industry for information before making a recommendation to the IS-HRC committee.
9. Revise Section 512.3.4 **Allowable uplift resistance** to indicate a basic wind speed for wood shingles instead of an allowable uplift pressure.
10. Revise Section 513.3.4 **Allowable uplift resistance** to indicate a basic wind speed for wood shakes instead of an allowable uplift pressure.
11. Coordinate the use of "approval" to insure that "approval" clearly indicates that this is the function of the local jurisdiction.
12. Clarify that wood battens are to be a minimum #2 grade wood that is either decay resistant or pressure treated.
13. Investigate establishing criteria for the attachment of mechanical equipment
14. Clarify that corrosion protection for ferrous fasteners is G85 modified when used with asphalt materials and products and that ferrous fasteners not in contact with asphalt material and products have to pass the salt-spray test (See TAS 114).
15. Clarify that non structural metal roofing is to comply with UL 580.
16. Place test procedures into a separate section for test procedures.
17. The design of roof coverings is to be based on wind pressures in Zone 3. The three roof zones for the typical building covered are not sufficiently large enough to justify the use of three separate installation criteria for each roof.

III. IS-HRC Direction

The Roofing Task Group needs the IS-HRC committee to determine the detail of the design tables. The design tables can be based on ASCE 7 format of exposure and mean roof height or simplified. Below is an example of the ASCE 7 format and one simplification.

ASCE 7						
Exposure B						
Mean Roof Height (ft)	Basic Wind Speed (mph)					
	100	110	120	130	140	150
0-30						
40						
Exposure C						
0-15						
20						
25						
30						
40						

Simplified						
Exposure B						
Mean Roof Height (ft)	Basic Wind Speed (mph)					
	100	110	120	130	140	150
0-40						
Exposure C						
0-40						