WINDOW WALL WORKGROUP

REPORT TO THE FLORIDA BUILDING COMMISSION

June 15, 2009

Gainesville, Florida

Facilitation, Meeting and Process Design By

CONSENSUS SOLUTIONS

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FLORIDA BUILDING COMMISSION

WINDOW WALL WORKGROUP REPORT

Overview and Project Scope

Raul L. Rodriguez, AIA, Chair of the Florida Building Commission, at the request of industry convened a Window Workgroup, charged with representing their stakeholder group's interests, and working with other interest groups to develop a consensus package of recommendations for submittal to the Florida Building Commission. The original scope and purpose of the Workgroup was to provide recommendations on how to provide building officials with needed information for conducting field inspections to ensure windows comply with the relevant wind pressure Code requirements. In addition, the workgroup was charged with considering issues related to window installation and water intrusion. The Workgroup developed consensus on a package of recommendations primarily related to the components and format for a supplemental label, to function as an inspection label, at the May 2006 meeting, and subsequent to the May meeting, window industry stakeholders requested an additional meeting and opportunity to reconsider the package of recommendations. The Chair agreed to reconvene the Workgroup and charged them with reviewing and deciding on the consensus recommendations, which were finalized in November of 2006 and delivered to the Commission in December of 2006, and implemented through the 2007 Code Update Cycle. In April of 2007, the Workgroup's scope was expanded to evaluate and develop consensus recommendations for a template for installation instructions submitted for product approval submittals. The Workgroup completed and delivered their consensus recommendations to the Commission in April of 2007.

At the April 2009 Commission meeting, Chairman Rodriguez announced that the Window Workgroup was renamed to the Window/Wall Workgroup, with the expanded scope of evaluating and developing recommendations regarding the window-wall interface (installation and water intrusion).

Window/Wall Workgroup Members

Robert Amoruso, Chuck Anderson, Joe Belcher, Bob Boyer, Rusty Carrol, Jaime Gascon, Dale Griener, Jim Gulde, Jon Hill, C.W. Macomber, Dave Olmstead, Craig Parrino, Roger Sanders, Jim Schock, Jeff Stone, Steve Strawn, Jim Stropoli, Jim Westphal, Dick Wilhelm, and Dwight Wilkes.

REPORT OF THE JUNE 15, 2009 MEETING

Opening and Meeting Attendance
The meeting started at 9:00 AM, and the following Workgroup members were present: Chuck Anderson, , Bob Boyer, Bill Dumbaugh as alternate for Rusty Carrol, Dale Griener, C.W. Macomber, Dave Olmstead, Roger Sanders, Jim Schock, Jim Stropoli, Jim Westphal, Dick Wilhelm, and Dwight Wilkes.

Members Absent
Robert Amoruso, Joe Belcher, Jaime Gascon, Jim Gulde, Jon Hill, Craig Parrino, Jeff Stone, and Steve Strawn.

DCA Staff Present
Rick Dixon and Mo Madani.

Meeting Facilitation
The meeting was facilitated by Jeff Blair from the FCRC Consensus Center at Florida State University. Information at: http://consensus.fsu.edu/

Project Webpage
Information on the project, including agenda packets, meeting reports, and related documents may be found in downloadable formats at the project webpage below:
http://consensus.fsu.edu/FBC/wwg.html

Agenda Review and Approval
The Workgroup voted unanimously, 12 - 0 in favor, to approve the agenda as presented including the following objectives:

- ✓ To Approve Regular Procedural Topics (Agenda)
- ✓ To Review Workgroup Procedures, Guidelines, and Decision-Making Requirements
- ✓ To Hear an Overview of the Workgroup's Scope and Charge, and Task Development Strategy
- ✓ To Hear and Discuss UF Research Relevant to Windows and the Window/Wall Interface
- ✓ To Identify Issues and Options Regarding Windows and the Window/Wall Interface
- ✓ To Discuss and Evaluate Level of Acceptability of Proposed Options
- ✓ To Consider Public Comment
- ✓ To Identify Needed Next Steps: Information, Assignments, and Agenda Items for Next Meeting

Review of Commission's Subcommittee Meeting Guidelines, Consensus-Building and Decision-Making Process, and Sunshine Requirements

Jeff Blair, Commission Facilitator, reviewed the Workgroup's process, decision-making procedures, and applicability of the Sunshine Law and answered member's questions. The relevant documents were provided on pages 4 – 7 of the meeting agenda packet.

Review of Window/Wall Workgroup Scope

Rick Dixon, FBC Executive Director, provided members with an overview of the project scope and answered member's questions. Rick explained that the scope of the Workgroup is to evaluate and develop recommendations regarding the window-wall interface (installation and water intrusion). The goal is to provide the Commission (after review by the relevant TAC) with proposed Code modifications for the 2010 Code Update process to eliminate water infiltration at the interface.

Identification of Issues Regarding Windows and the Window/Wall Interface to be Addressed in the 2010 Florida Building Code

Members were asked to identify and discuss relevant issues regarding water infiltration and the window/wall interface. Following is a summary of the discussions:

Overview of Discussion:

R.Dixon: would like for industry to provide perspective on accomplishments since the 2004 Code regarding decreasing water intrusion through window wall interface.

J.Westphal: we (industry) are not proactive by inclination, need to be aware of the specifics of failures. Code requirements for installation requirements should be clarified (i.e. curtain walls are listed under garage doors and hat provides confusion).

R.Dixon: need criteria for different technologies, not lump together into one set of criteria.

R.Dixon: wind and rain damage investigations after 2004/2005 indicated there had been long-term damage to sheathing (not from the storms only). Is technology of the actual product problem or the assembly (installation). Installation details are needed to match the requirements for specific products, and the problem grows with large product lines where one size does not fill all.

C.Anderson: is there any 2004 data indicating whether products meeting the 15% static test failed (for certified products).

R.Dixon: you already know the answer is no, its too expensive without funding for research.

C.Anderson: field testing was started before the storms and we had no complaints on the product, installation seems to be the problem. Since 2004 Code, industry has created awareness regarding window/wall interface to improve quality of installation. Installation is the key to resolving the issue, and correcting improperly manufactured/designed products.

D.Olmstead: since 2004 tracked millions of windows for water intrusion problems. 81% of water intrusion calls were directly related to installation issues. Installers rarely seek education/training. May need licensure program for installers.

D.Wilkes: agree that there is a need to review and expand Code sections dedicated to proper installation of systems/products. Need installation standards on this issue and to organize them better within Code. Should also separate two issues: water intrusion due to improper installation (i.e., flashing), and 15% design pressure requirement should be evaluated for efficacy/validity.

D.Wilhelm: industry has accepted the challenge to improve consensus standards for window installation.

FMA/WDMA/AAMA have developed consensus standards for exterior doors (AAMA 100 and 200). They should be reviewed for inclusion in the Code. Industry is working to develop standards for the Code: proper installation is key. Need to work with the installers when developing standards, and use their expertise in the process to ensure what is developed works in the field. Industry is working hard on a systems approach to the issues.
J.Schock: installation is the biggest problem we have seen. City of Jacksonville created a stucco installation bulletin for the jurisdiction to ensure proper installation. Provided a double drainage plane; now Phase II bulletin being developed to address bands and penetration of stucco walls by windows.
Involved industry with bulletin: received push-back from contractors/installers on Phase I, so need to work with installers to ensure buy-in. Working on fenestration requirements for stucco walls and problems faced.
R.Sanders: there is now more engineering design for single family construction today to ensure structures can tolerate storms and serve as shelter. Inspectors are using a detailed checklist to ensure installation is being done correctly and to the Code.

Presentation on Window Installation in Stucco Wall Systems
Josh Gideon, City of Jacksonville, provided members a PowerPoint presentation on issues regarding window installations in stucco wall systems, and answered member's questions. Josh identified two primary issues:
1. How to seal the stucco to the window
2. How should the connection between stucco veneer and windows be achieved.

Josh indicated that the standards are clear and generally accepted regarding sealing the stucco to the window, but there is no consistency in opinion between the standards and installation practices for achieving the connection between the stucco veneer and windows. On balance, correct installation practices involve ensuring the stucco veneer does not come into contact with any portion of the fenestration product, there is an adequate gap between the stucco and window frame to provide for a casing bead at the stucco edge, and a backer rod and sealant should be applied in the gap between the stucco veneer and window frame.

Overview of Discussion:
J.Westphal: the J-channel problems is communication issue and can be redesigned to correct if the message is conveyed back to the manufacturer. Need properly designed products that are installed correctly. Its a two-way street: installer and manufacturer need to communicate regarding issues and correct them. Manufacturer have become reactive and not proactive. Need quality installers too.
D.Greiner: should change design of problem products and provide proper installation. Next steps should be ensuring repair and maintenance by owners is addressed. The issue of maintenance and repair requirements could be addressed in the Existing Building Code.
J.Schock: I agree, we can get installation correct and 10 years later there are problems due to poorly designed/improper products and lack of proper maintenance.
D.Wilkes: homes with more coats of paint have proved to help keep water out. Need to consider maintenance on the Existing Code. The owner has to take responsibility at some point to ensure system is maintained. Lathe manufacturer's, are designing products to address problems. Aesthetic problems are used as an excuse not to correct problem installations, also cost is used as an excuse why contractor's can't comply with the proper installation requirements. There is still a resistance to providing expansion joints.
C.Anderson: the design community has not addressed these issues either, need to include them as stakeholders in the process. In the residential market manufactures have product lines adaptable to different applications and lack the accessory products required to install some of the systems correctly.

Possible code changes:
Requires soffit connection to wall surface. Require a stucco stop to keep stucco off window frame.
R.Sanders: in installation details should provide the correct detail regarding not having stucco in contact with window frame. Installation requirements should include ensuring there are good options to trim and service the system later.

The full PowerPoint Presentation is available at the project webpage as follows:
http://consensus.fsu.edu/FBC/wwg.html

Relevant UF Research Regarding Windows and the Window/Wall Interface Review and Discussion
Forrest Masters, Assistant Professor of Civil and Coastal Engineering, provided members with an overview of current UF research projects being conducted by the UF Hurricane Test Lab regarding water infiltration and the window/wall interface. Forrest reported that UF is preparing to conduct tests during the week of June 22, 2009 on mulled window units installed in stucco walls. Following is the research strategy:

Testing Metrics

- An infiltration will be defined as ANY liquid water observed from the interior of the test specimen to have pervaded the moisture/air barrier of the window wall assembly
- When an infiltration is observed during testing the time into the test, pressure, location, and a brief description will be recorded
- All tests will be documented with pictures as well as video footage
- Data sheets will then be compared for each wall and conclusions will be drawn from these pressure results

Future Research

- UF is funded through the end of the year
  - NSF, 8/15/2009
  - FSU, 12/31/2009
- Next topics prioritized
  - Secondary Water Resistance of Impact Resistant Products
  - Water Resistance of Doors
  - Pre-Storm Water Management Techniques
- Suggestions? Feedback

Overview of Discussion:

D.Wilhelm: FMA will be conducting a workshop on water intrusion for exterior doors.

C.Anderson: mull bars used in the testing should be longer to replicate real world deflection factors. Need over 60".

F.Masters: we can use higher pressures to help compensate for the shorter mull bars.

D.Olmstead: FHBA report stated mulled windows leak 100% of time. There was no accounting for field-mulled units and/or improper installation practices. The report painted mulled window units with a broad brush and research will show that properly designed and installed mulled window units will function well.

The full PowerPoint Presentation is available at the project webpage as follows:
http://consensus.fsu.edu/FBC/wwg.html

Identification, Discussion and Evaluation in Turn of Options

Rick Dixon asked members to identify ideas for Code amendments for the 2010 Code Update process regarding reducing water infiltration from the window wall interface, and send them to Jeff Blair for compilation. In addition, members should identify research/study needs for water infiltration from the window wall interface.

Overview of Discussion:

R.Dixon: we need to get wall contractors involved the process to ensure their perspective is included in the development of Code amendments. Need ideas for how to seal walls better, and to factor in water loading factors.

C.Anderson: a document is in development, AAMA 520 regarding pulsating water test for windows. It won't be ready for 2010 Code update process. The amount of water used in testing has large tolerances, and needs to be adjusted. Economy is hurting the effort. Need replication of tests to ensure efficacy of results. Validity of testing requires replication of tests and correlation of results. Need calibration device for labs to use in testing, to ensure tests and results are valid and accurate.

R.Dixon: need to identify issues for research to solve problems regarding window/wall interface and water infiltration. To minimize water leakage, need to consider the window types used vs. only installation details. Awning and casement may be best performing units in high wind pressure and water events.

C.Anderson: there is a preference by designers/specifiers for single/double hung units. Also window sizes are large in Florida and that favors mulled single/double hung units. it is a marketing issue and marketing drives consumer choices.

R.Dixon: how can we provide incentives for the consumer to change window styles for those that perform best.

D.Olmstead: tie in with organizations like FLASH, for effective public outreach. Contact design professional associations like the AIA.

R.Dixon: need a rating system to provide consumer with information to help drive their decisions.

D.Wilhelm: there are different types of builders and some track builders provide no options for consumers.

R.Dixon: then we need to get lead builders to change window styles so market will change. AAMA test procedure and rating systems are being developed. Government could assist in promoting these as an incentive to industry.

F.Masters: a Florida hurricane rating system is being developed.

C.Anderson: insurance companies could provide incentives/discounts for better window choices.

F.Masters: there is a wind incentive premium program for insurance companies, and blueprint for safety (FLASH). Rating programs do exist.

R.Dixon: need to provide incentives for the insurance companies too so they will participate.

J.Westphal: need qualifications for installers in order to maintain quality of installations. Need a licensing program for installers.

C.W.Macomber: in the field, contractors and job site supervisors believe that quality of workmanship issues and not a code requirement, would have to add provisions to the Code to address this. Installation instructions are hard to generalize for Code purposes. Product Approval submittals should be changed to require more information for proper installation instructions. Can we add this to the scope of recommendations for the Window/Wall Workgroup? When manufacturers' self-affirm to updated Code editions they, don't update installations instructions.
R.Sanders: remember who is using the installation instructions in the field. Need to make them easy to understand. May need to give project a red tag for not having installation instructions on site.
D.Wilkes: need to expand the Code to create sections for installation instructions. They should be in an organized section of the Code and easy to find and use.
J.Stropoli: if you require Product Approval administrator to evaluate to water requirements, the correlating Code requirements will need to be in place so you know what is being required.
D.Wilhelm: this costs money, and manufacturers also have attorneys telling them how to conduct business and what they can/can't do. If require more product Approval submittals/requirements, there will be an associated cost.
R.Dixon: what motivates manufacturers is the publicity, for example structural problems were solved due to the public outcry. Now water infiltration problems are an issue and owners are demanding water tight homes, so window/door openings will be identified as issue. in the public forum. Need to be proactive and demonstrate industry is trying to address this issue already.
J.Schock: moisture issue is big due to mold and mildew issues that results from water intrusion.
R.Dixon: may want to require foil-faced drywall in Code to deal with moisture in walls. Moisture migration in CMUs creates problems due to vapor pressure pushing moisture through the wall, and then the paper backing on drywall molds. Need to return to past methods used prior to use of AC. Windows are being blamed for wall problems too.
D.Wilhelm: green building movement makes rooms more air tight, right?
R.Dixon: air tightness requirements have been there for 20 years, we have reduce air changes with tight houses and energy code requirements. The air changeover rates are less than ASHRAE standards require, and as a result indoor air quality issues ensue. AC systems don't run long enough to pull humidity from indoor air, and more efficient standards requirements met by manufacturers as cheaply as possible, and units can't dehumidify.
D.Wilhelm: window industry can produce a product that meets any energy efficiency requirements, but there is a cost.
R.Dixon: wet water leaks need to be addressed by this Workgroup, we can't remove moisture fast enough with current systems.
C.Anderson: drywall is called the perfect food for mold, should consider Code changes to address drywall concerns, such as requiring moisture resistant drywall.
J.Schock: the Window/Wall Workgroup should have a representative for large scale builders to participate in the process.

Review of Workgroup Delivery and Meeting Schedule
The Workgroup's delivery and meeting schedule is as follows:

Workgroup appointed	4/8/09
Workgroup meetings	6/8/09
	8/09-10/09
Recommendations to Commission	12/09
Proposals for 2010 FBC submitted for adoption	3/10

(See 2010 FBC development schedule: 2010 Code Effective date is 12/31/2011)

Next Steps
Workgroup members will identify possible Code amendment recommendations for the 2010 Code Update Process regarding reducing water infiltration from the window wall interface, and send them to Jeff Blair for compilation in an "Options Evaluation Worksheet". Members should also identify research needs regarding water infiltration and the window wall interface. At the next meeting the Workgroup will identify and evaluate the range of options for possible Code amendments for the 2010 Code Update process.

Adjourn
The Workgroup voted unanimously, 12 - 0 in favor, to adjourn at 12:00 PM.

ATTACHMENT 1

MEETING EVALUATION

Average rank using a 0 to *10* scale, where *0* means totally disagree and *10* means totally agree.

1. Please assess the overall meeting.

9.5 The background information was very useful.
9.5 The agenda packet was very useful.
9.6 The objectives for the meeting were stated at the outset.
9.2 Overall, the objectives of the meeting were fully achieved.

2. Do you agree that each of the following meeting objectives was achieved?

9.4 Review Workgroup Procedures, Guidelines, and Decision-Making Requirements.
9.5 Overview of the Workgroup's Scope and Charge, and Task Development Strategy.
9.4 Discussion of UF Research Relevant to Windows and the Window/Wall Interface.
9.2 Identification of Issues and Options Regarding Windows and the Window/Wall Interface.
8.7 Evaluation and Acceptability Ranking of Proposed Options.
9.0 Identification of Next Steps.

3. Please tell us how well the Facilitator helped the participants engage in the meeting.

9.7 The members followed the direction of the Facilitator.
9.7 The Facilitator made sure the concerns of all members were heard.
9.8 The Facilitator helped us arrange our time well.
9.7 Participant input was documented accurately.

4. Please tell us your level of satisfaction with the meeting?

9.6 Overall, I am very satisfied with the meeting.
9.7 I was very satisfied with the services provided by the Facilitator.
9.6 I am satisfied with the outcome of the meeting.

5. Please tell us how well the next steps were communicated?

9.5 I know what the next steps following this meeting will be.
9.6 I know who is responsible for the next steps.

6. What did you like best about the meeting?

- Efficiently run.
- Good group of attendees.
- All knowledgeable on issues.
- Efficient, participation.
- Time frame.
- Issues presented by Josh Gideon (City of Jacksonville).

7. How could the meeting have been improved?

- Meet more central location, Orlando.
- Have them on Tues. – Fri., have to travel on Sunday for 4 hour meeting.
- Longer.
- More specific preparation by participants

8. Do you have any other comments? Please use the back of this page if needed.

None provided.

ATTACHMENT 2

MEETING ATTENDANCE—PUBLIC

Public Meeting Attendance
Name
Forrest Masters
Michael LaFevre
Joshua Gideon