FEMA Building Science Branch Flood and Wind Mitigation Accomplishments in Calendar Year 2011

Report Submitted December 2011

FEMA

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1. Introduction

The Federal Emergency Management Agency (FEMA) Building Science Branch develops mitigation guidance that focuses on creating disaster-resilient communities. Our research-based guidance promotes best practices designed to create safer communities and reduce the loss of life and property. The Building Science Branch of the FEMA Federal Insurance and Mitigation Administration (FIMA) Risk Reduction Division works with industry groups, consulting experts, and State and local communities to provide state-of-the-art technical hazard mitigation solutions for buildings.

This annual report highlights Building Science Branch accomplishments related specifically to flood and wind mitigation completed in calendar year (CY) 2011, including publications, conference participation, and training and outreach efforts. These accomplishments demonstrate how FEMA and its partners are reducing disaster loss throughout the country.

Additional Building Science Branch information and resources can be found at http://www.fema.gov/rebuild/buildingscience/index.shtm.

2. Flood and Wind Accomplishments in CY 2011

FEMA project activities are categorized below by publications, conferences, workshops/training, private industry events (projects and activities conducted in cooperation with private industry partners), and code monitoring. Activities under each section are listed in chronological order.

2.1 Special Recognition

A Presidential Proclamation for National Building Safety Month was issued in May, 2011. It is the first time ever that such a proclamation has been issued. The Building Science Branch championed the effort to get the proclamation issued which stresses that building safety is a critical component of our personal and public safety and that it is the collective responsibility of the Nation to implement effective codes and standards to sustain safe and resilient structures. http://www.whitehouse.gov/the-press-office/2011/05/09/presidential-proclamation-national-building-safety-month

Another notable accomplishment is that key Building Science Branch personnel received a 2011 Federal Emergency Management Agency Administrator's Award for Outstanding Survivor Service as team members of the Safe Rooms Initiative.

2.2 Publications

Flood Resistant Provisions of the 2009 International Building Code (January 2011)

FEMA Building Science Branch prepared and made available via its website, two new building code resource documents. One is a compilation of flood resistant provisions of the 2009 International Code Series (IBC, IRC, IEBC IMC, IPC, IFGC, IPSDC, IFC), and the other is a summary of changes from the 2006 IBC and a table comparing provisions of the 2009 I-Codes/ ASCE 24-05 and the National Flood Insurance Program (NFIP) requirements. The 2006 and

2009 editions of the I-Codes contain provisions that are consistent with the minimum flood-resistant design and construction requirements of the NFIP. (http://www.fema.gov/rebuild/buildingscience/coderesources.shtm)

Journal of Hazard Mitigation Articles (March 2011)

FEMA Building Science sponsored and prepared two articles published in the inaugural issue of the Journal of Hazard Mitigation (JHAZ). The first article, *Green Building Practices for Residential Construction and Natural Hazard Resistance: How Are They Linked?*, provides an overview of the relationship between green building practices and natural hazard resistance. The second article, *FEMA Updates Safe Room Publications*, outlines the design updates for safe rooms constructed out of reinforced concrete and masonry in the latest versions of FEMA safe room publications FEMA-320, *Taking Shelter from the Storm: Building a Safe Room for Your Home or Small Business*, and FEMA-361, *Design and Construction Guidance for Community Safe Rooms*, both dated August 2008. (http://www.wbdg.org/pdfs/jhaz_spring11.pdf)

Homeowner's Handbook to Prepare for Natural Hazards (University of Hawaii Sea Grant College Program) (July 2011)

The Building Science Branch provided technical support to the University of Hawaii Sea Grant College Program in preparing the Homeowner's Handbook to Prepare for Natural Hazards. This handbook provides homeowners with information to assist with natural hazard preparations so that risks to family and property may be reduced. Support included technical recommendations and reference to relevant FEMA publications and figures. Free at the University of Hawai'i Sea Grant College Program website. (http://seagrant.soest.hawaii.edu/homeowners-handbook-prepare-natural-hazards)

CodeMaster – Flood Resistant Design (2009/2012 IBC, 2009/2012 IRC, ASCE 7-05/7-10, ASCE 24-05) (August 2011)

This CodeMaster is the first-ever 8-page CodeMaster and contains everything you need to know about designing a structure for flood loads in accordance with the International Building Code (IBC), International Residential Code (IRC), and American Society of Civil Engineers (ASCE) standards 7-05, 7-10, and 24-05. It is also the first CodeMaster that works with multiple editions of the I-codes (2009, 2012). In 8 pages, this handy laminated guide explains the flood resistant design requirements of the National Flood Insurance Program as implemented through the IBC and IRC, and provides a clear and concise 12-step procedure explaining how to determine flood loads. A terminology section is provided so that the designer can easily refer back to the many terms and acronyms used in flood resistant design. Numerous illustrations are provided to illustrate key concepts and more than ten "Secrets of the CodeMaster" are included to help the designer avoid making costly mistakes. An example covering all 12 steps is also included. Available from SK Gosh for $18. (http://skghoshassociates.com/codemaster-flood-resistant-design-20092012-ibc-20092012-irc-asce-7-057-10-asce-24-05/)

Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas (4th edition), (August 2011)

The Coastal Construction Manual (CCM), 4th edition (FEMA P-55) was completed in August 2011. It is a two-volume publication that provides a comprehensive approach to planning, siting, designing, constructing, and maintaining homes in the coastal environment. Volume I provides information about hazard identification, siting decisions, regulatory requirements, economic implications, and risk management. The primary audience for Volume I is design professionals, officials, and those involved in the decision-making process. Volume II contains in-depth descriptions of design, construction, and maintenance practices that, when followed, will increase the durability of residential buildings in the harsh coastal environment and reduce economic losses associated with coastal natural disasters. The primary audience for Volume II is the design professional who is familiar with building codes and standards and has a basic understanding of engineering principles. Free from FEMA's Publication Library. (http://www.fema.gov/library/viewRecord.do?id=1671)

2.3 Conferences

FEMA Hazard Mitigation Assistance (HMA) Summit, La Jolla, CA (March 14–18, 2011)

FEMA Building Science Branch representatives delivered the following presentations at the HMA Summit:

- A half-day training session: "Retrofitting Residential Buildings for Wind Hazard." The training was about FEMA P-804, *Wind Retrofit Guide for Residential Buildings*. It was held on Tuesday morning, March 15, 2011, during the concurrent training sessions and there were approximately 12 people in attendance.
- A half-day training session: "Preparing a Successful Safe Room Grant Application." The training summarized the HMA Unified Guidance, and the need to comply with FEMA 361 and FEMA 320 requirements for a safe room. It was held on Tuesday afternoon, March 15, 2011, during the concurrent training sessions and there were approximately 12 people in attendance.
- A half-day presentation of FEMA P-804, *Wind Retrofit Guide for Residential Buildings*, during the afternoon concurrent sessions on Wednesday, March 16, 2011. There were approximately 15 people in attendance.

National Hurricane Conference, Atlanta, GA (April 18–22, 2011)

FEMA Building Science Branch personnel attended the conference in Atlanta, GA, from April 18 through 22, 2011, and hosted a booth in the exhibit hall. FEMA Building Science representatives presented two 90 minute "Engineering: Building and Structures" workshops. FEMA publications P-804, *Wind Retrofit Guide for Residential Buildings*; P-550, *Recommended Residential Construction for Coastal Areas*; P-798, *Natural Hazards and Sustainability for Residential Buildings*; P-499, *Home Builder's Guide to Coastal Construction*, as well as the latest versions of the Flood CodeMaster design guide and Flood Damage-Resistant Materials

Pre-Standard were all highlighted in the presentations. Both sessions had approximately 40 people in attendance.

Association of Floodplain Managers (ASFPM) Conference, Louisville, KY (May 15–20, 2011)

A FEMA Building Science Branch representative presented on the role of FEMA Building Science in a showcase session. Additionally, representatives presented multiple educational sessions and workshops. Presentation topics included the Flood CodeMaster design guide, higher flood standards, flood damage-resistant materials pre-standard, updates to FEMA publications, and velocity grids. A workshop on the Substantial Damage Estimator software was conducted. The sessions all had approximately 200 people in attendance. Additionally, FEMA Building Science had a booth in the exhibit hall.

Safer Alabama Summit, Tuscaloosa, AL (June 13, 2011)

FEMA Building Science Branch staff participated as panelists during one of the sessions and provided technical support at the FEMA Building Science booth during the summit. The summit was held on the University of Alabama campus on June 13, 2011, as a result of the April 27, 2011, tornadoes. The conference had approximately 140 people in attendance.

36th Annual Natural Hazards Research and Applications Workshop, Broomfield, CO (July 9–12, 2011)

The conference was hosted by the University of Colorado's Natural Hazards Center from July 9 through 12, 2011 in Broomfield CO. FEMA Building Science Branch personnel hosted and participated in a panel discussion on sustainability and hazard resistance titled "Green Building Codes and Standards: Improving Natural Hazard Resistance or Creating Design Challenges?" The session was well attended with approximately 30 people who actively participated in a group discussion.

Floodplain Management Association Conference; *Floodplain Management in the 21st Century*, San Diego, CA (September 6–9, 2011)

FEMA Building Science representatives presented an educational workshop, "Flood Provisions of the 2009 International Code Series" at the conference. Fifteen people attended the 1-day workshop. The workshop presented the flood provisions in the International Code Series and demonstrated that the provisions are consistent with National Flood Insurance Program requirements for buildings and structures in flood hazard areas.

2011 ASFPM National Floodproofing Conference, Sacramento, CA (November 28 – December 1, 2011)

FEMA Building Science Branch representatives presented in several educational sessions and workshops. Presentations included:

- Flood Pre-Standard and Flood Damage-Resistant Materials Research
- Technical Bulletin 1: *Openings in Foundation Walls and Walls of Enclosures*

- Design Flood Elevation vs. Base Flood Elevation
- Updates to FEMA P-55, *Coastal Construction Manual*
- The Flood CodeMaster
- Elevation Projects

2.4 Workshops/Training

Puerto Rico Flood Workshops

John Ingargiola and Rebecca Quinn presented the workshop titled *The Flood Provisions of the 2009 International Code Series* in Puerto Rico. Three workshops were held the week of January 10, 2011, in San Juan, Ponce, and Mayaguez, PR. Approximately 187 people attended the workshops. Puerto Rico recently adopted the 2009 International Codes, and these workshops provided an overview of flood provisions of the 2009 International Code Series in relation to previous International Codes, ASCE 24, and the National Flood Insurance Program.

Puerto Rico Wind Workshops

John Ingargiola and Adam Reeder presented the workshop titled *The Wind Provisions of the 2009 International Code Series* in Puerto Rico. Three workshops were held the week of January 24, 2011, in San Juan, Ponce, and Mayaguez, PR. Approximately 170 people attended the workshops. Puerto Rico recently adopted the 2009 International Codes, and these workshops provided an overview of flood provisions of the 2009 International Code Series in relation to previous International Codes, ASCE 7, and the Uniform Building Code (UBC 1997).

Design of Buildings in Coastal Regions

Hosted by ASCE, Bill Coulbourne and Tom Smith taught the 2-day course at the Naval Facilities Engineering Command in Norfolk, VA, on March 15 through 16, 2011, and in Portland, MA, on June 2 and 3, 2011. The course covers design requirements and FEMA guidance for construction in coastal regions. In addition to familiarizing the attendees with the requirements of ASCE/SEI 24-05 and IBC, the course also introduces the guidance covered in FEMA 361, *Design and Construction Guidance for Community Safe Rooms*; *ICC/NSSA Standard for the Design and Construction of Storm Shelters* (ICC 500-2008); FEMA 55, *Coastal Construction Manual*; FEMA 543, *Design Guide for Improving Critical Facility Safety from Flooding and High Winds*; FEMA 577, *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds*; as well as ATC 45, *Field Manual: Safety Evaluation of Buildings after Windstorms and Floods*; ASCE 7; and lessons learned from Hurricanes Charley, Frances, Ivan, and Katrina. Building types covered included residential, non-residential, and critical facilities. There were approximately 35 engineers in attendance at the Norfolk course and 10 attendees at the Portland course.

Safe Room Training Workshops

Sponsored by The National Storm Shelter Association, Texas Department of Public Safety, and FEMA, Dr. Kiesling, Dr. Mehta, Larry Tanner, and Corey Schultz presented both 1-day and two-

day versions of the workshop on April 25, 2011 in Ft. Worth, TX; on April 21 and 22, 2011 in Austin, TX; and on May 23 and 24, 2011 in Birmingham, AL. The 1-day workshop covered residential shelters as detailed in FEMA 320, while the 2-day workshop covered community shelters as detailed in ICC-500 and FEMA 361. Approximately 110 people attended these workshops.

Substantial Damage Estimator Workshop

Adrienne Sheldon, Don Glondys, and John Ingargiola presented the workshop titled *Substantial Damage Estimator* at the Association of Floodplain Managers Conference on May 18, 2011, in Louisville, KY. Approximately 18 people attended the 4-hour workshop. The focus of the workshop was on introducing the newly finalized FEMA Substantial Damage Estimator (SDE), which includes software, an accompanying User's Manual and Workbook, and a video. This workshop provided specific instruction on the practical application of the SDE software.

Design and Construction Guidance of Safe Rooms for Architects and Engineering

Dr. Ernst Kiesling and Adam Reeder presented this 2-day workshop at the Alabama Joint Field Office (JFO) in Birmingham, AL, on July 25 and 26, 2011. Adam Reeder and Glenn Overcash also presented this 2-day workshop at the Alabama JFO in Birmingham, AL, on September 13 and 14, 2011. Approximately 30 people attended each of the workshops. These workshops were held in response to the tornado disasters in April that affected the State of Alabama. The workshop covered the criteria for design and construction of safe rooms as detailed in FEMA 361 and ICC-500.

Design and Construction Guidance of Safe Rooms

Tom Reynolds and Glenn Overcash presented this 1-day workshop at the Alabama JFO in Birmingham, AL, on July 26 and 27, 2011. Approximately 30 people attended each of the workshops. This workshop was held in response to the tornado disasters in April that affected the State of Alabama. The workshop covered introduced the criteria for design and construction of safe rooms as detailed in FEMA 361 and ICC-500.

Preparing a Successful Safe Room Grant Application

Tom Reynolds and Rhonda Murphy presented this 1-day workshop in Brownsville, TX on August 9, 2011; in Houston, TX on August 16, 2011; and at the Louisiana Recovery Office in New Orleans, LA on August 23 and 25, 2011. Approximately 90 people attended the workshops. The workshops covered the FEMA safe room grant application requirements as detailed in the HMA Unified Guidance and the FEMA Mitigation Interim Policy on Safe Rooms (MRR-2-09-1), as well as FEMA 361, FEMA 320, and ICC-500 requirements.

E386 – Residential Coastal Construction

Bill Coulbourne taught this 4½-day course at Emergency Management Institute (EMI) on August 15-18, 2011. The course covered design requirements and FEMA guidance for construction in coastal regions as detailed in FEMA 55, *Coastal Construction Manual*. There were approximately 13 people in attendance.

Building Code Training Seminars

Puerto Rico has adopted the 2009 International Codes (I-Codes) and amended them to local conditions. Therefore, Puerto Rico needs to educate design professionals, Government officials, engineers, and contractors of the adopted code, local amendments, and proper applications related to the I-Codes. In response to these needs, FEMA provided technical code training to Government of Puerto Rico personnel. ICC staff conducted the following seminars in Puerto Rico.

- 2009 IBC Fundamentals Structural Provisions (May 17, 2011) had approximately 50 attendees. The seminar examined structural provision requirements of the IBC and addressed major elements including structural design, structural tests and special inspections, foundations, concrete, masonry, steel and wood.
- 2009 IBC Fundamentals Nonstructural Provisions (May 18, 2011) had 17 attendees. This seminar focused on the basic nonstructural concepts of the 2009 IBC. A clear understanding of these requirements allows users to apply the IBC in specific situations, and understanding the intent of the code allows them to make a judgment on code compliance when necessary.
- 2009 IBC Nonstructural Fire and Life Safety Principles (August 12 and 13, 2011) had approximately 60 attendees.
- 2009 International Fire Code (IFC) Fire Protection Systems (August 18, 2011) had approximately 50 attendees.
- 2009 International Existing Building Code (IEBC) Fundamentals (August 19, 2011) had approximately 50 attendees.
- 2009 IRC Fundamentals Building Provisions (September 1, 2011) had approximately 50 attendees.

Homeland Security Training Course

The URS team taught the E-156 Building Design for Homeland Security Training Course at EMI in Emmitsburg, MD, on August 23 through 25, 2011. The course focused on continuity of operations, risk assessments, and mitigation measures through building design. The training was well received, had excellent class participation, and received excellent student evaluations. About 30 students attended the course sessions.

Safe Room Training Workshops

Tom Reynolds and Glenn Overcash presented the 2-day technical version of the workshop in Baton Rouge, LA on October 10 and 11, 2011, and in Lake Charles, LA on October 24 and 25, 2011. The 2-day workshop covered community shelters as detailed in ICC-500 and FEMA 361. Approximately 24 people attended the workshops.

Institute for Business & Home Safety/FEMA Wind Retrofit Guide Webinar

John Ingargiola presented on FEMA P-804, *Wind Retrofit Guide for Residential Buildings*, providing an overview of the publication and the three "Mitigation Packages" that it prescribes.

The discussion included how the publication supports the FEMA strategic plan for fiscal years 2011 through 2014 and why the publication was developed. The presentation also touched on how wind retrofit projects done in accordance with FEMA P-804 can be evaluated for cost effectiveness and be funded through FEMA grant programs.

Substantial Improvement/Substantial Damage Course

The 1-day Substantial Improvement/Substantial Damage (SI/SD) course was presented by Rebecca Quinn in Narragansett, RI on November 8, 2011, and in Windsor, CT on November 9, 2011. There were approximately 24 people in attendance at the CT training session and 28 people in attendance at the RI training session.

Residential Coastal Construction 2-Day Field Course

Adam Reeder and Chris Jones presented the 2-day course in Houston, TX, on November 15 and 16, 2011 and December 6 and 7, 2011. The course covered design requirements and FEMA guidance for construction in coastal regions as detailed in FEMA P-55, *Coastal Construction Manual*. There were approximately 15 people in attendance at the November session and 19 people in attendance at the December session.

2.5 Building Science Helpline

The Building Science Branch maintains the FEMA Flood/Wind Building Science and Safe Room Expert Helplines assist with inquiries from individuals or groups who have read FEMA building science publications and have specific questions, people who have not read the publications and need guidance, people referred from the National Flood Insurance Program (NFIP)/Map Mod Helpline, people with building code questions, FEMA Regions or State offices, insurance experts, and homeowners. As of the November 30, 2011, 1513 helpline inquiries have been address for CY2011. There are 7 inquiry categories. The list below identifies the types and number of inquiries addressed for each:

(1) Building code questions – 18 inquiries addressed

(2) Riverine flood damage and floodplain questions – 5 inquiries addressed

(3) Coastal flood damage and floodplain questions – 11 inquiries addressed

(4) Safe room, wind damage, and building envelope questions – 1443 inquiries addressed

(5) Geotechnical and foundation engineering questions – 1 inquiry addressed

(6) Other flood- and wind-resistant building design and construction questions – 35 inquiries addressed

(7) Seismic and utility questions – 0 inquiries addressed

2.6 Private Industry Events and Participation

National Association of Home Builders' (NAHB's) International Builders' Show, Orlando, FL (January 12–15, 2011)

FEMA Building Science Branch representatives presented a 90 minute session titled "Building Stronger Homes in the Face of Hurricanes, Floods, and Earthquakes" on January 12, 2011. The session discussed observations and recommendations for homeowners and contractors to protect homes from wind, flood, and earthquake hazards. FEMA publications P-804, *Wind Retrofit Guide for Residential Buildings*; P-550, *Recommended Residential Construction for Coastal Areas*; P-798, *Natural Hazards and Sustainability for Residential Buildings*; and 232, *Homebuilder's Guide to Earthquake-Resistant Design and Construction*, as well as the latest Mitigation Assessment Team (MAT) reports, were all highlighted in the presentations. The session had approximately 40 people in attendance.

Engineering News-Record (ENR) Mitigating Disaster through Design and Construction Conference, Washington, DC (March 2–3, 2011)

FEMA Building Science was a Silver Sponsor for this conference in Washington, DC. Sandra Knight was a keynote speaker on March 2, 2011. FEMA Building Science Branch representatives participated as panelists on the How Planning, Codes, and Standards Can Help Mitigation Succeed session and the Sustainability and Natural Hazard Mitigation session. FEMA Building Science hosted a booth both days of the conference. The conference had approximately 140 people in attendance.

Federal Alliance for Safe Homes (FLASH) 2011 Annual Meeting, Lake Buena Vista, FL (October 26–28, 2011)

FEMA Building Science participated in the 2011 FLASH conference and presented on the Tornado MAT findings to approximately 130 people. FEMA Building Science hosted a booth where approximately 295 CDs and publications were distributed.

2011 ICC Expo, Phoenix, AZ (October 31–November 2, 2011)

FEMA Building Science participated in the ICC conference in Phoenix, AZ. A FEMA Building Science Branch representative was a panelist on the Government Relations Forum, a panel to discuss the relationship between the Government and the ICC. Representatives presented in multiple Cracker Barrel and educational sessions. Presentation topics included three 20-minute Cracker Barrel sessions on FEMA P-798, Natural Hazards, and Sustainability with 24 attendees; three 20-minute Cracker Barrel sessions on the Flood CodeMaster with 6 attendees; and two 3-hour educational sessions on Substantial Improvement/Substantial Damage with 31 attendees.

2.7 Code Monitoring and Adoption Tracking

ASCE/SEI 24-05 – Flood-Resistant Design and Construction

FEMA Building Sciences Branch is a member of the committee appointed by ASCE to develop the next edition of ASCE 24. ASCE 24 is a standard referenced by the flood provisions of the

International Code Series that forms the basis of state and local building codes. The ASCE 24 revision process started in 2011 and the new edition is expected in 2013. FEMA and other committee members submitted more than 200 proposed changes. It is anticipated that the new edition of ASCE 24 will be referenced by the 2015 edition of the International Code Series.

Building Code Adoption Tracking

The FEMA Building Science Branch monitors building code adoption around the country. Quarterly reports are produced that update the existing baseline data to determine the number of jurisdictions in hazard-prone regions that have adopted building codes with disaster provisions. Reports are generated for disaster-resistant, flood-resistant, hurricane-resistant, and seismic-resistant building codes. During 2011, the number of jurisdictions that have adopted building codes with disaster-resistant provisions increased 21 percent. The number of jurisdictions with flood-resistant, hurricane-resistant, seismic-resistant building codes has increased 23 percent, 5 percent, and 20 percent, respectively.

ICC 500 - Standard for the Design and Construction of Storm Shelters

FEMA has submitted 14 code recommendations regarding construction documents, requirements for placement of shelters in schools and critical facilities, peer review, and a recommendation for commentary. The update is ongoing for the next code revision.

ICC 600 - Standard for Residential Construction in High-Wind Regions

FEMA has submitted 7 code recommendations regarding flood-resistant construction, storm shelters, and the use of appendices in the standard. The update is ongoing for the next code revision.

ICC 700 - National Green Building Standard

In October, the Building Science Branch reviewed approximately 30 code recommendations for the National Green Building Standard Public Comment Draft. Changes proposed in the Public Comment Draft covered topics such as storm water management plans, material usage, moisture control measures, foundations, and environmentally sensitive and flood hazardous areas fenestration. The update to this standard is on-going and the standard will be published in 2012.

International Green Construction Code (IgCC) Final Action hearings

FEMA participated in the October 2011 IgCC Final Action hearings. Six code change proposals were monitored, and one proposal was commented on related to the flood hazard on FEMA's behalf.

National Fire Protection Association (NFPA) 501/225 Standard on Manufactured Housing

Public comments were submitted to update engineering standards, specifically, the ASCE/SEI 24 from the 1998 edition to the 2005 edition. FEMA 85, FEMA 348, FEMA Form 81-31, and Technical Bulletin 2 were updated to the most recent versions. The code proposals passed in July 2011.

3. Ongoing and Upcoming Flood and Wind Activities for CY 2012

The FEMA Building Science Branch anticipates a very active year ahead. In an effort to engage the planning and design community and promote FEMA's mitigation recommendations, FEMA Building Science will continue to participate in numerous conferences and professional organizational meetings. In 2012, FEMA will be participating in more than 10 conferences through presentations, workshops, and exhibit space; conferences include the International Code Council Annual Conference, Association of State Floodplain Managers Annual Conference, and the National Hurricane Conference.

Following are some of the key efforts that the Building Science Branch is undertaking:

Code Monitoring and Adoption Tracking

2012 is a very active year for building code development. Below is a list of building code activities that the FEMA Building Science Branch is pursuing:

- Building Code Adoption tracking quarterly update
- ICC: Group A proposals (IBC) submitted and participation in code development hearing in spring 2012
- ICC 500: Submitted code proposals and will participate in standard meeting in spring 2012
- ICC 600: Submitted code proposals and will participate in standard meeting in spring 2012
- NFPA 54 and 58: Provide proposals to ensure flood provisions are available for liquid propane tanks in spring 2012
- ICC Group B: Prepare group B (IRC, IgCC) proposals for January 2013 deadline
- ASCE 24: Finalize draft of document
- ASTM Standard on Flood Resistant Materials: participate on the committee

In addition, the FEMA Building Science Branch is monitoring a number of new code and standard initiatives that may lead to improved wind hazard resistant design including:

- American National Standards Institute (ANSI) Foam Sheathing Standard
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) TC2.7, Wind
- Florida Building Code Asphalt Shingle Working Group
- American Society of Testing Materials (ASTM) Standard on Wind Resistant Shingles

Code Adoption Article

The Building Science Branch has identified benefits of working with building codes for floodplain risk management including mitigation, compliance with NFIP, enforcement, and single source referencing. Practices of several key states realizing these benefits is highlighted

including Florida, California and Oregon in a summary article that is currently under development. One positive outcome is increased coordination among floodplain managers and building officials. The article is slated to be submitted for publication in a variety of relevant association and organization newsletters in CY 2012 to reach a wide audience.

Update of FEMA 787

FEMA Building Science Branch is developing the third edition of FEMA-787, *Catalog of FEMA Wind, Flood, and Wildfire Publications, Training Courses, and Workshops*. It is anticipated that the updated publication will be available in early 2012.

Building Science Training Course and Workshop Publication

FEMA Building Science Branch is developing a new publication on Building Science Training Courses and Workshops. The new publication will complement FEMA-787, *Catalog of FEMA Wind, Flood, and Wildfire Publications, Training Courses, and Workshops,* by providing detailed information of Building Science training courses and workshops including announcement/flyer templates for each course. This new publication will be available in early 2012.

Engineering Principles and Practices of Retrofitting Floodprone Structures

FEMA is in the process of updating the publication FEMA-259, *Engineering Principles and Practices of Retrofitting Floodprone Structures,* from its second to its third edition to further aid homeowners in selecting and successfully executing a flood retrofit on their home. FEMA 259 provides engineering design and economic guidance on what constitutes feasible and cost-effective retrofitting measures for floodprone residential and non-residential structures. FEMA 259 discusses elevation, relocation, dry floodproofing, wet floodproofing, and the use of levees and floodwalls to mitigate the flood hazard. This publication is expected to be available in February 2012.

Mitigation Assessment Team Report Spring 2011 Tornadoes: April 25–28 and May 22 Building Performance Observations, Recommendations, and Technical Guidance

On May 6, 2011, the FEMA Mitigation Division deployed a Mitigation Assessment Team (MAT) to the States of Alabama, Georgia, Mississippi, and Tennessee to assess the damage caused by an outbreak of tornadoes occurring April 25 through April 28, 2011. A second MAT was deployed on June 1, 2011, to Missouri following the tornado on May 22 in Joplin. This report presents MAT observations, conclusions, and recommendations in response to those field investigations and is expected in spring 2012.

Emergency Electrical Power for Critical Facilities Guidance

This publication will provide recommendations on maintaining electrical power in hospitals, Emergency Operations Centers, and other facilities that need to remain partially or fully operational during and after a natural or manmade disaster. The anticipated completion date is May 2012.

SDE Software Update

Development for SDE version 2.0 has begun. The Building Science Branch will be garnering comments from FEMA Regional staff as updates occur. The new version is expected to be available in summer 2012.

Draft Implementation Guidance: ASCE 24 Engineering Standards for HMA Flood Retrofitting and Reconstruction Projects

The Building Science Branch is leading an effort to develop Draft Implementation Guidance-ASCE 24 Engineering Standards for HMA Flood Retrofitting and Reconstruction Projects. The guidance will illustrate how the ASCE 24-05 standard should be applied when designing and constructing flood mitigation projects (including building elevation, dry floodproofing and mitigation reconstruction), as well as developing grant applications for them. Several representatives from various FIMA branches will participate in the development of this guidance by providing comments, reviewing drafts, and helping to steer the direction of the publication as well as associated materials (such as checklists). The document is slated for completion in fall 2012.

Floodproofing Guidance for Existing Nonresidential Buildings

Guidance document is being developed that focuses on floodproofing as a retrofitting technique for existing non-residential buildings to mitigate flood damage. The document will specifically address floodproofing larger commercial buildings in more urban areas, present technical information about specific floodproofing measures, and include case studies to show real-world examples of successful floodproofing efforts. The document is slated for completion in fall 2012.

Flood Damage-Resistant Materials Pre-Standard

Building Science Branch is leading an ongoing effort to develop a standard for flood-resistant materials. This year, ASTM issued a work item for the current pre-standard, which is an important step in the standard development process. The work item is currently being advertised, and Task Group members are being identified; early next year, the Building Science Branch will begin facilitating Task Group meetings and potential revisions to the pre-standard, followed by the subcommittee, committee, and ASTM general membership balloting processes. A parallel effort is occurring to examine the structural and environmental impacts of floodwater on building materials and assemblies via laboratory testing.

National Building Museum Exhibit

The National Building Museum is planning an exhibition and educational outreach initiative called “Designing for Disaster,” set to open in October 2013. FEMA Building Science, through its participation on the exhibition’s advisory council, will work with our partners to help the museum develop aspects of the exhibit related to hazard mitigation solutions and success stories.

Building Science Helpline FAQs

The Building Science Branch is updating the Building Science Helpline FAQs to incorporate new questions and answers and streamlining the organization of the FAQs on the Website FEMA-Buildingsciencehelp@fema.dhs.gov.

4. Contact Information

For questions or comments, please contact the Building Science Helpline at (866) 927-2104 or e-mail FEMA-Buildingsciencehelp@fema.dhs.gov. Please allow up to 5 business days for a response. Additionally, John Ingargiola, EI, CFM, CBO Building Science Branch Team Leader, can be reached at (202) 646-3452 or john.ingargiola@fema.dhs.gov. The Building Science website also offers additional information and resources: http://www.fema.gov/rebuild/buildingscience/index.shtm.