McCullen Management Consultants MMCLLC

Connecting Companies

SIPA Conference April 30th 2014
Why are we talking about Resilience?

U.S. 2012 Billion-dollar Weather and Climate Disasters

- Western Wildfire Summer-Fall 2012
- Rockies/Southwest Severe Weather June 6-12 2012
- Midwest Tornadoes April 13-14 2012
- Texas Tornadoes April 2-3 2012
- Texas Tornadoes May 25-30 2012
- Southern Plains/Midwest/Northeast Severe Weather May 28-June 2 2012
- Midwest/Ohio Valley Severe Weather April 28-May 1 2012
- Plains/East/Northeast Derecho & Severe Weather June 29-July 3 2012
- Sandy October 2012
- Southeast/Ohio Valley Tornadoes March 2-3 2012
- L.S. Drought/Heatwave Summer 2012 (covering over half the U.S. during 2012)
We have all seen the results
Natural disasters are not going away

- 2012 saw 11 weather and climate disaster events each with losses exceeding $1 billion in damages
- 2012 was the second costliest year since 1980, $110 billion (2005 incurred $160 billion), including $65B from Hurricane Sandy
- The entire country is effected

Source: NOAA’s National Climatic Data Center
Weather Disaster Opportunity for Construction

### U.S Climate and Weather Disasters 1980-2010

<table>
<thead>
<tr>
<th>DISASTER TYPE</th>
<th>NUMBER OF EVENTS</th>
<th>PERCENT FREQUENCY</th>
<th>NORMALIZED DAMAGES (Billions of Dollars)</th>
<th>PERCENT DAMAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Storms/Hurricanes</td>
<td>27</td>
<td>27.2%</td>
<td>367.3</td>
<td>50.6%</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>21</td>
<td>21.2%</td>
<td>41.4</td>
<td>5.7%</td>
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<tr>
<td>Heatwaves/Droughts</td>
<td>15</td>
<td>15.2%</td>
<td>185.2</td>
<td>25.6%</td>
</tr>
<tr>
<td>Non-Tropical Floods</td>
<td>15</td>
<td>15.2%</td>
<td>74.3</td>
<td>10.2%</td>
</tr>
<tr>
<td>Fires</td>
<td>10</td>
<td>10.1%</td>
<td>19.2</td>
<td>2.6%</td>
</tr>
<tr>
<td>Freezes</td>
<td>6</td>
<td>6.1%</td>
<td>18.6</td>
<td>2.6%</td>
</tr>
<tr>
<td>Blizzards</td>
<td>2</td>
<td>2.0%</td>
<td>11.9</td>
<td>1.6%</td>
</tr>
<tr>
<td>Ice Storms</td>
<td>2</td>
<td>2.0%</td>
<td>5.9</td>
<td>~0.8%</td>
</tr>
<tr>
<td>Noreaster</td>
<td>1</td>
<td>1.0%</td>
<td>2.2</td>
<td>~0.3%</td>
</tr>
<tr>
<td></td>
<td><strong>99</strong></td>
<td><strong>1.0%</strong></td>
<td><strong>726.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Annual average 2.8 events per year at a cost of $18 Billion:
71.7% is labor
28.3% is material = $5.4 Billion

Huge substitution opportunity for construction products annually
Weather Disaster Opportunity for Construction compounds - Cost of Storms over 10 years

- Oklahoma #2
- Oklahoma Moore
- Tuscolaosa
- Joplin
- Isaac
- Sandy
- Irene
- Ike
- Gustov
- Rita
- Katrina

$ Billion

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How Severe Weather Creates Damage at Failure Points

Wind uplift or crosswinds creates the damage to homes.

Wind Path @140mph

Wind damage to roof and gable walls

Diagram showing wind loads and effects on a house.
Resilience as a new Market Segment for SIPs
Non-Government Organization Intermediaries

- Institute for Business and Home Safety (IBHS)
- Federal Alliance for Safe Homes (FLASH)
- International Code Council (ICC)
- Insurance Information Institute (III)
- Florida Insurance Council (FIC)
- Insurance Research Council (IRC)
- Risk and Insurance Management Society (RIMS)
- American Insurance Association (AIA)
- National Safety Council (NSC)
- National Institute for Building Sciences (NIBS)
- Risk Management Solutions (RMS)
The Insurance Industry’s Trade Organization
IBHS Research Center
Wind Storm Demonstrations
October 2010
Why does one house survive and another does not?
What is FORTIFIED?

FORTIFIED MEANS RESILIENCE

Over the last decade storms like Ike, Irene, Katrina and Sandy have amplified the need to make homes and businesses more resilient. In 2010, the Insurance Institute for Business & Home Safety’s FORTIFIED Home™ Program made best practice engineering and building standards - developed using more than 20 years of storm damage investigations - available to anyone seeking to strengthen existing single-family, detached homes.

FORTIFIED can be affordable at every price point and uses a unique systems-based method for creating stronger, safer homes. The program employs an incremental approach toward making existing homes more resistant to damage from hurricanes, tropical storms, hailstorms, high winds and wind-driven rain associated with thunderstorms. With three levels of FORTIFIED Home™ designation available – Bronze, Silver and Gold – builders can work with homeowners to choose a desired level of protection that best suits their budgets and resilience goals.

FORTIFIED AND BUILDING CODES

The intent of residential building codes is primarily life safety protection, not to ensure that the home is habitable after a catastrophic event or to protect the other property contained in the home. In short, from a building code standpoint, the home and its contents are disposable. By definition, building codes are and should be a minimum requirement. Unfortunately, older homes are typically built to weaker standards for hazard resistance than those included in modern building codes, and even today not every state has a mandatory code. Furthermore, where codes are adopted, the codes and the quality of enforcement can vary significantly; and in some states, code enforcement may even be optional. Homeowners often lack adequate information about what codes were followed when their homes were built and how well those standards were enforced or even how they stack up against today’s codes.

The FORTIFIED Home™ Program works differently. It provides a uniform, voluntary, superior set of standards to upgrade the home and help improve its resilience by adding system-specific upgrades to minimum code requirements. Every FORTIFIED Home is inspected by a certified evaluator - before and after these upgrades are performed. Before work begins, a thorough audit is performed and a customized report is prepared for the property owner with specific information about how their home was built and the steps that can be taken to make it more resilient. This enables homeowners to make informed decisions about their home, to maximize investment in disaster-resilience, and to achieve the peace of mind that their home has more hazard resistance than
Tornadoes
Disaster Mitigation is also about Life Safety

- Disaster Mitigation is about protection of property and PEOPLE
- This swath represents $2B dollars from a tornado in Moore, OK. Building better could help protect the green and yellow areas.
Reports of Hail Equal to or Greater than 2.5"
Counties with Recorded Hail Equal to or Greater than 2.5" between 1955 and 2000
WHAT’S MISSING?
Impact resistant standards for siding and fenestration.
2012 IBHS Ratings by State: Highest to Lowest

State | Total | Adoption of code, universality, and weakening provisions | Enforcement Officials | Contractor Licensing | Midterm Update
--- | --- | --- | --- | --- | ---
Florida | 95 | 48 | 22 | 25 | ▲
Virginia | 95 | 48 | 22 | 25 | ▲
New Jersey | 93 | 49 | 23 | 21 | ▲
Massachusetts | 87 | 46 | 21 | 20 | ▲
South Carolina | 84 | 45 | 18 | 21 | ▲
Connecticut | 81 | 40 | 24 | 17 | ▲
North Carolina | 81 | 40 | 22 | 19 | ▲
Rhode Island | 78 | 44 | 19 | 15 | ▲
Louisiana | 73 | 48 | 15 | 10 | ▲
Maryland | 73 | 43 | 15 | 15 | ▲
Georgia | 66 | 31 | 15 | 20 | ▲
Maine | 64 | 33 | 22 | 9 | ▲
New York | 60 | 37 | 23 | 0 | ▲
New Hampshire | 49 | 39 | 0 | 10 | ▲
Alabama | 18 | 0 | 18 | 0 | ▲
Texas | 18 | 18 | 0 | 0 | ▲
Delaware | 17 | 4 | 13 | 0 | ▲
Mississippi | 4 | 0 | 4 | 0 | ▲

IBHS ratings were weighted based on the following variables:
- 30 percent for variables that relate to adoption and enforcement of building codes.
- 25 percent for variables that measure code official certification and training.
- 25 percent for variables that relate to on-site implementation, as measured by contractor and subcontractor licensing.

Positive Action

NEW JERSEY AND NEW YORK

New Jersey and New York learned firsthand about the importance of building codes when the region was struck by Hurricane Sandy in October 2012. New Jersey had one of the highest scores in the original rating the States Report, and newer structures built to the more recent codes reportedly performed well in the face of Sandy's winds. However, history-making storm surge caused devastating floods and destroyed approximately 30,000 homes. In January 2013, Governor Chris Christie signed emergency regulations to adopt the Federal Emergency Management Agency’s (FEMA) updated Advisory Base Flood Elevation (ABFE) maps as the rebuilding standard for the state—a change that should enhance property protection not only from coastal storm surge, but also from tree line flooding that is frequent in the state.

In New York, the original rating the States Report noted that New York City’s building regulatory system is exempt from the New York State building code requirements, and in fact had weakened several important wind protection requirements in the state code. The devastation from Sandy initiated a robust dialogue on the importance of strong building codes to the rebuilding process. New York City is in the process of adopting its own code based on the 2000 edition of the IRC, with an anticipated effective date during the first half of 2014. More work is needed to ensure that homes built in New York City and the rest of the state meet the latest model building codes, but the state appears to be moving, albeit slowly, in a positive direction.
So how do we change behaviors?

- **Resilience** has to become **Cool** - Like the green movement or new technology
- **Education** and public awareness are the Keys
- People **pay attention** most just after the disaster
- **Public Policy** has to support changes in the built environment
- **Stronger Building Codes** must be adopted and enforced
- The **Construction Industry** has to be open to change
- Financial institutions and appraisers have to **recognize and reward** stronger construction
Mission: Strengthening Homes & Safeguarding Families

• At FLASH, we partner with leading public, private and nonprofit academic, consumer, entertainment, financial services, product, research, service and technical organizations to deliver the latest advances in disaster safety information to the public
• Create a public value for strong, safe and sustainable homes
• Deliver initiatives that fit into three program tracks
  • Storytelling for the public (Consumer Awareness)
  • Curriculum for students & professionals (Education & Training)
  • Policy leadership for influencers
• Mainstream the science of safe and strong buildings
FLASH proudly acknowledges its Legacy Partners for their unwavering support of FLASH and its mission.

FLASH also wishes to recognize its Founding Partners, whose commitment and involvement with FLASH propelled us towards our bright future.
Who pays?

• Who funds resilience or lack thereof?
  • Public (FEMA Relief)
  • Private
    • Individuals/families through mitigation
    • Insurance with proceeds post-storm

• How we can incentivize resilience before disaster strikes?
  • Building codes and standards that deliver more than safety alone
  • Incentives for families to embrace mitigation and protect their properties
    • Property insurance credits/discounts
    • Tax relief
      • Disaster Savings Account of 2013

• How do we promote these ideas?
The Resilience Scoring Utility (ReScU™) is a performance-based tool that measures home’s resilience to natural disaster hazards.

In partnership with AIA, FLASH is developing a “plus” guide for homes to include detailed structural drawings, floor plan considerations and steps on how to incorporate resilience into any existing or new home.
Launched in 2010, this insurance industry program is designed to help strengthen existing homes through retrofit techniques that will ward off damage from specific natural hazards. From basic improvements to whole-house renovations, almost any homeowner can gain peace of mind from Mother Nature by earning a FORTIFIED designation.

The Blueprint for Safety Education Program® mission is to provide residential builders and citizens with accurate, current and reliable information about how to make homes more disaster-resistant. The *Blueprint for Safety Field Manual* offers information about how to build, remodel or restore homes using disaster-resistant techniques, technologies and products.
Tale of Two Homes: Superstorm Sandy

Tale of Two Homes Video Series
- Four stories from a trusted voice
- Each combines compelling narrative with strong technical learning

Contrasting Superstorm Sandy Outcomes
- Sochacki family story of survival
- Benefits of building with strong codes and durable techniques like concrete
- PCA as technical partner

StormStruck: A Tale of Two Homes

- 4D Interactive Theater Experience
- #1 INNOVENTIONS experience since 2008 (millions of visitors)
- 10,000+ kiosk generated postcards sent each month
- 19,000+ app downloads since April 2013
- Leading social psychologists expanding research
- 150+ private tours
Insurance Influence on Design

Community Level
- Code Adoption
- Code Enforcement

Individual Building Owner
- Underwriting
- Premiums

National Level
- Code Development
- Beyond Code Programs

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Disaster Response and Insurance Intermediaries must be involved in lead generation

- EFI Global
- Universal Restoration
- Belfor Restoration
- Paul Davis Restoration
- Xactware Insurance claims software
- Simsol Insurance Claims Software
- Crawford Claim Services
- Roofing Industry Committee on Weather Issues (RICOWI)
- Property Loss Research Bureau (PLRB)
- Building Performance Institute (BPI)
- Roofing Consultants Industry (RCI)
Conclusions

- The future of construction markets will be driven by new technology
- Non Government Organizations must support and endorse new building technologies and methodologies
- The Structured Insulated Panel Industry can benefit greatly from outreach and education about the resilient properties of SIPs
- Technical information and cost comparisons will help appraisers and insurance companies understand the benefits of SIPs
- An application process with IBHS FORTIFIED program will help qualify Sips as approved for insurance credits in 8 states
- More Consumer education will be needed to pull through sales for retrofits and new construction
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