IRENE 2011 VS. SANDY 2012
Building To Higher Standards Changed Everything

- Woodbridge NJ home owner rebuilds his ravaged home after Hurricane Irene hits in 2011.
- Sandy hits the rebuilt home and there is no damage
- Woodbridge Code Official States 35 homes with collapsed foundations after Sandy
Significant Savings

83%

ROI: 2 Years
Case Studies

- Case studies
  - New residence, post Katrina, LA
  - New church, post Katrina, LA
Case study — Use a family home

<table>
<thead>
<tr>
<th>House &quot;A&quot; Residential</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Square ft. enclosed area</td>
<td>2620</td>
</tr>
<tr>
<td>$ Structure coverage</td>
<td>$250,000.00</td>
</tr>
<tr>
<td>$ Contents Coverage</td>
<td>$100,000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Flood Insurance Premiums</th>
<th>% reduction as first floor goes up</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Vents 1st flr 4’ below BFE</td>
<td>$12,415.00</td>
</tr>
<tr>
<td>No Vents 1st flr 3’ below BFE</td>
<td>$8,472.00</td>
</tr>
<tr>
<td>No Vents 1st flr 2’ below BFE</td>
<td>$6,708.00</td>
</tr>
<tr>
<td>No Vents 1st flr 1’ below BFE</td>
<td>$4,849.00</td>
</tr>
<tr>
<td>With Vents 1st flr @ BFE</td>
<td>$1,195.00</td>
</tr>
<tr>
<td>With Vents 1st flr 1’ ABOVE BFE</td>
<td>$400.00</td>
</tr>
</tbody>
</table>

% decrease in premium worst case to best
Case study — Noah’s Ark Church

Case Study 2

• Project:
  ➤ Noah’s Ark, Missionary Baptist Church, Westwego, LA
  ➤ Post Katrina new construction

• Requirements:
  ➤ NFIP compliant foundation
    - Flood protection
    - Air ventilated crawl space
Case study — Noah’s Ark Church
Case study — Noah’s Ark Church

Specifying Foundation Flood Vents for Building Sustainability, Durability and Performance
Case study — Noah’s Ark Church

<table>
<thead>
<tr>
<th>House “B” Non Residential</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Square ft. enclosed area</td>
<td>3030</td>
</tr>
<tr>
<td>$ Structure coverage</td>
<td>$500,000.00</td>
</tr>
<tr>
<td>$ Contents Coverage</td>
<td>$500,000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Flood Insurance Premiums</th>
<th>% reduction as first floor goes up</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Vents 1st flr 4’ below BFE</td>
<td>$46,486.00</td>
</tr>
<tr>
<td>No Vents 1st flr 3’ below BFE</td>
<td>$33,394.00 28%</td>
</tr>
<tr>
<td>No Vents 1st flr 2’ below BFE</td>
<td>$24,845.00 26%</td>
</tr>
<tr>
<td>No Vents 1st flr 1’ below BFE</td>
<td>$18,582.00 25%</td>
</tr>
<tr>
<td>With Vents 1st flr @ BFE</td>
<td>$4,901.00 74%</td>
</tr>
<tr>
<td>With Vents 1st flr 1’ ABOVE BFE</td>
<td>$1,194.00 97%</td>
</tr>
</tbody>
</table>

% decrease in premium worst case to best
During a flood event, immense hydrostatic forces are in action.

Flood ventilation operates under the principle of relieving (rather than resisting) that pressure.

Relief is required by code, insurance companies, and the principles of good floodplain management.
The Effects of Hydrostatic Force
Crawlspaces
Full Height Enclosures
Full Height Enclosures (townhouse)
Attached Garages
Detached Accessory

Flood Vents Installed
Examples of Unacceptable Measures:
Debris Blockage
Three Options

1. ICC-ES Certified Engineered Openings

1. Unique project specific Engineered Openings

1. Non-engineered Openings
Engineered Flood Vent vs. a common non-engineered opening

Ex. of an engineered flood vent: has 200 sq. feet of rated flood protection.

Most commonly used non-engineered opening: has 42 sq. inches net, if opened and if the screen is removed.
Engineered Openings

• Why use engineered openings?
  – Fewer needed
  – Attractive designs
  – Solutions for retrofit

• Acceptable Certification
  – ICC-ES Evaluation Report
What is SMART VENT?

- SMART VENT is the only ICC-ES certified & FEMA accepted foundation flood vent on the market

- Very few marketable openings satisfy the requirements
Certifications

ESR-2074

Florida Approval
Let’s Do The Math

- 1,200 sq. foot crawlspace = (6) SMART VENTS
- 1200/42 sq. inches = (29) non-engineered
Placement Requirements

- Solid perimeter foundation wall (CMU or poured concrete)
- Joist/Truss
- Crawl space
- Flood opening
- Interior grade
- No more than 1 foot
- Exterior grade
- Framed wall around enclosure
- Footing depth per building code
- Flood opening
- Interior grade
- Exterior grade

SMART VENT
Foundation Flood Vents
FEMA Elevation Certificate

- Last check point before CO is granted
- Surveyor Completes
- Sections A8 & A9 Flood Vent Info
- Know your diagrams: 6,7,8,9
**ELEVATION CERTIFICATE**

Important: Read the instructions on pages 1-9.

<table>
<thead>
<tr>
<th>SECTION A - PROPERTY INFORMATION</th>
<th>For Insurance Company Use:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. Building Owner’s Name</td>
<td>Policy Number</td>
</tr>
<tr>
<td>A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.</td>
<td>Company NAIC Number</td>
</tr>
<tr>
<td>City</td>
<td>State</td>
</tr>
<tr>
<td>ZIP Code</td>
<td></td>
</tr>
</tbody>
</table>

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)

A5. Latitude/Longitude: Lat. ______________ Long. ______________

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number ______

A8. For a building with a crawlspace or enclosure(s):
   a) Square footage of crawlspace or enclosure(s)
   b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade
   c) Total net area of flood openings in A8.b
   d) Engineered flood openings? [X] Yes [ ] No

<table>
<thead>
<tr>
<th>1200 sq ft</th>
<th>6 sq in</th>
</tr>
</thead>
</table>

A9. For a building with an attached garage:
   a) Square footage of attached garage
   b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade
   c) Total net area of flood openings in A9.b
   d) Engineered flood openings? [X] Yes [ ] No

<table>
<thead>
<tr>
<th>600 sq ft</th>
<th>600 sq in</th>
</tr>
</thead>
</table>

**IMPORTANT:** In these spaces, copy the corresponding information from Section A.

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)**

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

**Comments**

**ICC-ES Evaluation Report Attached**
Crawlspace: short 743 sq.in/ft in flood venting protection
Garage: short 355 sq.in/ft in flood venting protection
Per The Elevation Certificate this Gable Air Vent only provided 35 sq. in of net open area.
Cutting Out The Wrong Product For the Job.
Removed a total of 5 Gable Vents. Three in the Crawlspace and two in the Garage.
After removing the gable vents we discovered they were clogged with debris on the inside. Not noticeable on the outside due to the louvers.
Louvers, Grills, & Screens impede the flow of flood water into and out of an enclosed space. They also act as nets catching debris and causing the opening to clog. The result..................
Installing The Right Product For The Job
Retrofitted Three 1540-511 (16”x16”) Dual Function Flood Vents Into the Crawlspace. Two 1540-521 (16”x16”) Insulated Flood Vents Into the Garage. Each vent is ICC-ES Certified to cover 400 sq.ft of enclosed area.
With the proper flood vents installed the Elevation Certificate will be changed to reflect the correct flood venting protection for the crawlspace and garage.

On average a retrofit like this example with save a home owner 83% on their flood insurance premium and give them piece of mind that they’re home is properly protected.
The Specifics: The Models

• We have two basic styles: dual-action, and flood-only.

• Both styles are available in several sizes and our full range of colors. *(Some colors will require lead time.)*

• We additionally offer a small line of accessories for use with the flood vents, to allow use in special conditions.
- The dual-action style is most appropriate for traditional crawlspaces.
- Air-ventilation louvers allow natural air ventilation.
- Louvers open and close automatically, in response to changing temperatures.
The FLOOD VENT: Model 1540-520

- The flood-only style is used in garages, walkout basements, etc.
- Insulated to minimize temperature exchange between inside and outside, with a two-inch thick foam core, and weather-stripping between the door and frame.
Wood Wall FLOOD VENT: Model 1540-570

• Wood Wall FLOOD VENT 1540-570 is designed to fit between 16"
• Available in the Insulated Model only
• Used in storage areas, garages, etc.; where air ventilation is not desired
• Our overhead door model is specially designed for easy installation into a garage or bay door.
• Painted white for minimal aesthetic footprint in most garage doors.
• Engineered to remain closed even when door is raised
The Trim & Sleeve Kit and Fire Damper are used in situations where a fire rating is compromised or to add a finished look to an interior wall.