Assisting with the Dry Material Delivery and Protection System

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• Data are still coming in…
• Gaining insights, but lessons still emerging…

Observations from the Eye of the Storm

A building material manufacturer’s point of view

Knowledge may have its purposes, but guessing is always more fun than knowing.

- W. H. Auden
2004 - A busy year for hurricanes
2005 – A Season of Firsts

• 1st with 26 named storms
• 1st with 13 hurricanes

• 1st with four major hurricanes hitting the U.S. (*Dennis, Katrina, Rita and Wilma*)

• 1st with three Category 5 hurricanes
# Costliest U.S. Hurricanes

<table>
<thead>
<tr>
<th>Rank</th>
<th>Hurricane</th>
<th>Year</th>
<th>Category</th>
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<tbody>
<tr>
<td>1</td>
<td>Katrina</td>
<td>2005</td>
<td>5</td>
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<tr>
<td>2</td>
<td>Andrew</td>
<td>1992</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Wilma</td>
<td>2005</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Rita</td>
<td>2005</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Charley</td>
<td>2004</td>
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<tr>
<td>6</td>
<td>Ivan</td>
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<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Frances</td>
<td>2004</td>
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<td>8</td>
<td>Hugo</td>
<td>1989</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>Camille</td>
<td>1969</td>
<td>5</td>
</tr>
</tbody>
</table>
Lessons Learned from Hurricane Recovery

- For dry material delivery, mostly logistical issues
  - Disposal of damaged materials
  - Dry storage & transportation
  - Job stocking, staging & storage
  - Common sense will take you a long way
- 2004 season confirmed it’s a big job, but basically no different than past disasters
- 2005 season introduced entirely new dimensions
Nothing new here...

- “Hurricane Katrina: A ‘Perfect Storm’ for Mold Litigation”
  
  Alexander Robertson, IV
  Mealey’s Litigation Report: Mold Vol. 5, #11

- “If you have found where you were exposed to toxic mold, you will need find the responsible parties (if any) who are capable of paying.”

A matter of scale...where to dispose of all the debris?

Photos by T. Townsend, K. Cochran & M. Semiz, University of Florida
Impact on Production Facilities

Materials shortages due to:

- Increased demand
- Interrupted & reduced production capacities
- Disruption of transportation & distribution networks
Consequences of Shortages

• Cost & schedule impacts

• Inappropriate materials substitutions
  • Check labels & product specifications to be sure they are right for the application
    • Looks can be deceiving for specific fire, acoustical, hygrothermal or antimicrobial properties

• Law of Commodity Products
  • If it’s not in the product specifications & the manufacturer doesn’t differentiate the product by claiming enhanced properties, the product will not have them!

• Know your supplier!
Moisture Resistance does not mean Mold Resistance!!!
**Mold will grow on anything...**

- Given time & the necessary environmental conditions
  - New Orleans plant office
  - Luxuriant mold growth on steel, plastic laminate, vinyl cushions, fabrics, etc.
Do you need to tear out wet drywall?

- Wallboard can be remediated
  - Dry quickly without damage
  - Can be cleaned & sterilized, but the cost of doing this properly often exceeds the cost of replacement.
- Rule of Thumb
  - Requires qualified professional judgment
  - When in doubt tear it out!
- IICRC S520 Standard and Reference Guide for Professional Mold Remediation
- IICRC S500 Standard and Reference Guide for Professional Water Damage Restoration
What does “dry quickly” mean?

- Rule of Thumb
  - 24 to 48 hours
- Onset of hyphae growth
- May be overly conservative for many cases, but there is insufficient data to support changing this general recommendation
Investigate impact of flood water on performance of traditional and flood-damage-resistant residential envelope systems.
Flood Damage-Resistant Construction

Energy-Efficient, Flood-Damage-Resistant Home Reconstruction

INTRODUCTION
The purpose of this fact sheet is to provide homeowners and builders with information on materials, practices, and methods that, when used to repair flooded homes, will make them more resistant to future flood damage. These flood damage-resistant reconstruction techniques will:
- Reduce the vulnerability of future flood damage and disruption.
- Potentially lower home flood insurance rates, and
- Reduce energy costs and increase home comfort.

The focus of this fact sheet is to study the damage from winter and spring flooding, where movement is primarily vertical—so storm water can essentially move water that could damage the building structure, plant, and furniture. It is based on floodwater data by the University of Alabama and the National Flood Damage Report. Because studies have not yet evaluated the impact of a visual or biological contaminant (e.g., lead or copper), definitive recommendations for envelope materials and finishes appropriate for contaminated environments are not available.

The Federal Emergency Management Agency (FEMA) defines flood damage resistance as the ability of materials, components, and systems to withstand direct or prolonged contact with floodwaters without causing degradation that requires more than cosmetic repair to restore them to their original condition. This definition should also include the selection of materials that are resistant to flood damage and that also limit damage to adjacent structures or the systems of which they are part. Cosmetic repair includes cleaning, simple painting, and reconditioning (e.g., varnishing, repair of parts, and replacement). It is a material to be considered in flood-damage-resistant practice and may replace the cost of replacing the affected item.

While new construction is typically excluded from the 100-year flood plain, flooding does occur beyond these floodplains associated with hurricanes or unusual storm events. New construction in areas outside the floodplain...
Parting Thoughts

- Moisture Control is the Key to Mold Control
- Know your source for information & materials
- If you design a levee for a once in 50 years event, don’t be surprised if it only lasts about 50 years.

- U.S. EPA