Hurricane Glass vs. Storm Shutters

At the start of the project we were tasked with coming up ideas for hurricane proofing new houses and existing houses. We started by researching methods already present, and from that we determined the cost of implementing existing ideas. Next, we began brainstorming for new ideas. Lastly we began applying all the ideas we had to houses, and thinking of alternative benefits.

**Hurricane Glass vs. Storm Shutters**

**Hurricane Glass**
- Pros:  
  - Eliminates the need for hurricane shutters  
  - No preparation for storm.  
  - Just pay for window, not both. Price range is $35-50 per square foot.
- Cons:  
  - Must be installed by a window contractor.  
  - Must get new window frames.  
  - Offer some of the best protection, and make an excellent theft deterrent.

**Storm Shutters**
- Pros:  
  - Can easily be made storm-ready by one person.  
  - Need backup energy supply to operate motors.  
  - Expensive, pay for both windows and shutter. Price $30-55 per square foot.
- Cons:  
  - Ihavn't been used on houses farther from the coast.

**Water-proof house outline**
- The first step is to pour the slab with the perimeter being about 4” taller than the interior.
- By installing James-Hardie Plank as a siding, each overlap of the boards will be caulked and the siding will overhang the foundation.
- In order to keep air circulation, install air intakes under the overhang of the roof so that water will not enter the system. These intakes will then be hooked up to the the air condition intake via air ducts or PVC piping. This creates a positive pressure in the house making it more energy efficient.
- In place of traditional (open cell) insulation, this house would have closed cell insulation which is a spray foam that fills in all cracks and crevices. This insulation eliminates the need for weep holes allowing for the house to be water proof.

**Cost Comparison Traditional vs. New Methods**

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<th>Open cell insulation:</th>
<th>Closed cell: $5,000 per house</th>
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<td>$2,000 per house</td>
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5 ton A/C unit: $2,702.58 (13 SEER)
1.5 ton A/C unit: $738.24 (13 SEER)

**Wood siding:** $7.3 per board foot
**Hardie Plank:** $5.3 per board foot

**New Hurricane Proofing Ideas For Existing Houses**

- **Securing Shingles**
  - Spend extra time and money gluing the shingles to the roof.
  - Applying waterproof seal on all doors including garage doors.
  - Paint and caulk siding to insure water resistance.

- **Water Proofing House**
  - No weep holes in walls
  - Bottom half of doors sealed when closed
  - AC unit has intake vents in-between walls as well as outside

**Future Work**
- Develop a wind resistant shingle system.
- Look into developing a shingle less roof.
- Test materials like Hardie Plank siding to confirm its water resistant traits.
- Develop a way to water proof openings like exhausts for a dryer.
- If possible, see whether storm shutters or hurricane glass is more durable through high speed testing.

**Conclusion**
From this project we learned how to function as a team, and to split up work in order to keep on schedule. We also learned to collaborate to turn our ideas into a better outcome than if we had done it alone. Lastly our group learned to look at the flaws in our original ideas, so that we could find solutions that successfully resolve our problems.