

## Wind House II – Deterioration Effect on Structure Resistance to High Winds

Wind House II, to be constructed on Park Service property near the Florida panhandle coast, will be the site of several studies to evaluate structure resistance to high-wind events. Deterioration of building components can negatively impact the capacity of a structure to withstand high winds. Therefore, the studies to be conducted by Mississippi State University (MSU) personnel will focus on areas of the structure where deterioration problems are known to exist, such as windows, pilings, and decks.

### Background

Moisture intrusion into walls that leads to decay is frequently associated with windows. Alternative methods of window installation will be investigated. Readings from moisture probes in the wall voids under windows will be one indication of the effectiveness of an installation procedure.

Pilings treated with waterborne preservatives that support structures along the Gulf Coast frequently display “pulping” action whereby the surface wood fibers separate and give the pilings a “fuzzy” appearance. This loss of effective piling diameter can significantly affect the capacity of pilings to support structures during high-wind events. It is hypothesized that this phenomenon is caused by the absorption and wicking of salt

water into the pilings. Possible methods of minimizing this absorption and wicking will be evaluated.

Deck boards exposed to high intensity ultraviolet (UV) light and successive wetting and drying cycles check and split excessively, and fasteners used in these deck boards corrode. In some cases, this has led to decks literally falling off the structure. Topically-applied deck treatments to stop this phenomenon will be evaluated.



**Alternative methods of installation will be investigated to help avoid improper installation as seen above. Moisture intrusion can and will lead to decay in wood associated with windows.**

### Objective

Studies will be conducted on the Wind House II to determine how to increase the resistance of the structure to high winds by preventing deterioration of the house framing.

### Approach

The infiltration of moisture into walls around windows will be measured by moisture probes (and perhaps CO<sub>2</sub> detectors) placed in wall voids under windows as well as visual inspection for signs of decay. Window installation procedures will focus on preventing wetting of framing near window openings. Techniques for minimizing the infiltration of salt water into piling will be evaluated by measuring the amount of pulp (loosening of fibers) on piling surfaces. Deck stabilization will be measured by the relative checking and splitting



**Decking exposed to high intensity UV light and successive wetting and drying cycles check and split excessively leading to fastener corrosion (right) causing untimely replacement of decking surfaces. Evaluation of topically-applied deck treatments to slow this phenomenon will be evaluated.**

of decking and corrosion of fasteners between various topical treatments.

## **Expected Outcomes**

One or more of the window installation procedures and piling or deck treatments are expected to prevent or minimize wood deterioration and thereby increase the capacity of the Wind House II to withstand high winds.

## **Timeline**

July-December 2007

- Develop study plans

- Secure building and research materials

January-June 2008

- Construct Wind House II

- Install research materials

- Establish deterioration studies

June 2009

- First annual inspection of deterioration test units  
(first of 5+ annual inspections)

## **Cooperators**

USDA Forest Service, Forest Products Laboratory  
Mississippi State University, Forest Products Laboratory

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