



A Resource for the State of Florida

**HURRICANE LOSS REDUCTION  
FOR  
HOUSING IN FLORIDA:**

**Section 3**

**Wall of Wind: Assistance in Development of Phase  
I and Testing of Soffits for Water Penetration**

**A Research Project Funded by  
The State of Florida Department of Community Affairs  
Through Contract # 06RC-A%-13-00-05-261**

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In Partnership with:  
The International Hurricane Research Center  
Florida International University

## Summary Report of Services Provided

During the performance period University of Florida assisted Florida International University with the continued development of the Phase I Wall of Wind (WoW) testing apparatus and soffit testing. Between January and July 2006 the WoW unit was located at the University of Florida at the Eastside Campus facility on Waldo Road. Dr. Forrest Masters (FIU) was the lead researcher, with development assistance provided by Dr. Kurtis Gurley (UF) through a subcontract to UF. The following is an accounting of the UF participation in the successful development of the FIU/IHRC Wall of Wind.

The services provided by UF include:

Physical facilities: UF provided storage, fabrication, data collection apparatus, power and a secured location to conduct testing. The unit was co-located at the site that housed the Florida Coastal Monitoring Program (FCMP) equipment, and where fabrication and upkeep is performed.

Labor: The development of the Wall of Wind apparatus and the subsequent testing is a labor intensive process. Much of this activity is suitable for student labor:

- Construction of soffit testing apparatus. This includes construction of the wind containment walls to channel and constrain wind flow, and construction of the visualization platform behind the test rig to permit observation and measurement of water penetration through soffit perforation.
- Upgrades to the water injection system for wind driven rain. This involved replacement of original hoses and nozzles to increase water volume and increase rain drop size, and development of a suitable plumbing system from the water reservoir through the pumps and into the wind field.
- Assisting with mechanical maintenance and modification of the WOW engines. This includes several iterations of radiator movement to improve air flow and cooling, customizing the throttle control to allow greater control of the engine speed, and assistance with standard repair and maintenance.
- Assisting in the performance of soffit testing. This required a team of students to manipulate the test apparatus, record data, monitor WOW performance, and daily set-up and take-down of sensitive equipment.

UF provided undergraduate students for these services. These students are also working on the FCMP project, and are familiar with experimental methods. During the course of this work they were jointly supervised by Dr. Masters, Dr. Gurley, and James Jesteadt (Lab Manager for IHRC Laboratory for Wind Engineering Research). FIU research students all provided assistance.

Materials and supplies: The continued development and testing of the Wall of Wind apparatus required the daily acquisition of supplies and materials to facilitate upgrades, build test apparatus, and accommodate the development process. This typically includes lumber, fuel, electronics, tools, hardware, and test specimens.

### **Timeline of Deliverables**

Tasks were carried out as dictated by Dr. Masters, from January 1, 2006 to July 31, 2006.

	Jan	Feb	March	April	May	June	July
Development	X	X	X	X	X	X	
Testing	X	X	X	X	X	X	X
Reporting							X