

The Insurance Research Lab for Better Homes

The effects of loads from wind, snow and rain on houses and other light-frame structures – particularly under extreme conditions – have historically been difficult to study under realistic circumstances; as a result, the ways buildings respond to these stresses to the point of failure have not been known. Now, however, *The Insurance Research Lab for Better Homes*, a groundbreaking \$7-million facility built by Western University at *London International Airport*, has begun providing answers these questions.



The Insurance Research Lab for Better Homes at London International Airport. A typical brick house is studied within the structure.

What is The Insurance Research Lab for Better Homes?

- First-of-its-kind facility that allows researchers to simulate and study realistic damage to full-scale houses from wind, snow and rain – all within a controlled environment
- Contains a typical two-storey brick house that comes complete with plumbing and heating, and has been built with an average number of construction flaws
- Dubbed the 'Three Little Pigs' project, it will help engineers assess and accurately predict how houses or light structures might behave under such environmental stresses as hurricanes

Highlights

Building on expertise developed through more than 45 years of pioneering wind tests at the *Boundary Layer Wind Tunnel Laboratory* at Western, this facility enables researchers to assess, under true-life conditions:

- The effects of snow-loading
- The effects of moisture from wind-driven rain
- The integrity of overall building structure
- How harmful moulds grow
- How loads move through structures to the ground
- How well individual and overall parts of buildings withstand stress
- The potential damage and failure from errors introduced during construction

Determining how structures fail will allow researchers to answer questions about the adequacy of building codes, lead to the development of wind damage mitigation strategies and result in the testing of different building products.

How They Do It

- Nearly 100 pressure boxes have been mounted to a framework surrounding the test house to simulate the swirling and gusting of hurricane-force winds up to 200 miles per hour, or the equivalent of a category 5 hurricane
- Dozens of pressure sensors and cameras linked to computers record all the stresses and damage sustained by the house, and how each part of the structure is affected
- The steel hangar surrounding the test house can also be removed on tracks to test the effects of the house's exposure to natural elements

Research Applications

Each year, catastrophic events like hurricanes and tornadoes cause serious injury, claim lives and destroy personal property worth billions of dollars. From a practical standpoint, Western's engineers will help insurance companies save money. Ultimately, however, catastrophic loss of life and property can be prevented by understanding how to make homes safer. By the time the model house gets blown down, researchers hope to know more about how to:

- Reduce construction error
- Build better structures to mitigate the enormous cost of disasters and save homes from destructive natural environmental forces
- Make recommendations to help modify building codes to build safer, less expensive houses
- Develop ways to retrofit homes in a cost-effective manner
- Compare homes made of different materials to see which ones withstand certain loads better

For more information, please visit: www.eng.uwo.ca/research/tlpp



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