SURE House: Analysis of the 2015 US Department of Energy Solar Decathlon Winner

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ABSTRACT

This presentation will take an in depth look at energy analysis and innovative design solutions of the SURE (SUstainable and REsilliant) House, a 1,000sf net zero and storm resilient prototype house designed and built by Stevens Institute of Technology for the 2015 US Department of Energy Solar Decathlon. The Stevens team won 7 of 10 decathlon categories and was declared the overall winner in October of 2015.

Concepts of architectural design including details and construction techniques for ultra low energy consumption and occupancy comfort goals, and engineering innovations such as DC solar-electric hot water, self islanding photo-voltaic array for grid-free power in an emergency, and prototype residential dry-waterproofing details to protect from storm debris and flooding will be covered in detail.

Analysis of real-time energy use will be compared to energy models, design challenges of a modular prototype discussed and techniques for flood proofing, air sealing and thermal bridge-free construction will be covered through the lens of the SURE House.

BIOGRAPHY

Tom is a graduate of Stevens Institute of Technology and held a leading role on the 2015 Decathlon team. Previously, he studied architecture at Roger Williams University, and composite manufacturing technologies at the International Yacht Restoration School (IYRS). Through his experiences in the world of lightweight, high strength materials, Tom spearheaded the research, design and fabrication of flood proofing prototypes on the SURE House. Tom is now a designer at King and King Architects exploring high performance buildings, renewable energy resources and leading architectural detailing to reduce energy consumption and increase occupant comfort in buildings.