



# Virginia Tech - Invent the Future

## The TOWNHAUZ



### Project Summary

The Townhomes at Admiral's Landing, a project by K. Hovnanian Home Builders in Dundalk, MD, is the basis for our project. Our team developed an exceptionally efficient unit design within the development constraints of a production home builder for the high-performance, 1690 square foot **TOWNHAUZ**. This design incorporates net-zero energy and passive energy design goals as well as utmost occupant safety and comfort. The Admiral's Landing community is an area experiencing revitalization, where increasing quality of life and energy efficiency is becoming a hallmark of new construction.



### Relevance of Project to the Goals of the Competition

Construction plans, details, financial analysis, and energy analysis were used to provide a clear estimate of achievement with respect to the DOE Zero Energy Ready Home performance mandate. The design team also placed additional emphasis on production builder needs, occupant comfort, overcoming mixed-humid climate challenges, high-performance qualities, and integrated design and construction management.

### Design Strategy and Key Points

The **TownHauZ's** design utilizes assemblies, layouts, and equipment that provide efficiency without sacrificing the occupant's experience. Occupant comfort, envelope durability, indoor air quality, space conditioning needs, and energy use were all considered. The final design's cost and relative benefits were weighed and considered when selecting the changes that were ultimately chosen to be incorporated. Energy modeling and hygrothermal analysis tools, including REM Rate, THERM and WUFI were used to analyze energy efficiency and compliance with DOE Zero Energy Ready Home and ENERGY STAR ratings.

### Project Data

- Project Location: Dundalk, Maryland
- IECC Climate Zone 4
- Square Footage: 1690
- 3 Bedroom, 2 ½ Bathroom, 3 Story Townhome
- HERS Score: 39
- Estimated Monthly Energy Cost: \$84.33

### Technical Specifications

- Wall Insulation = R-40
- Foundation Insulation = R-10
- Roof Insulation = R-60
- Window Performance = R-7.6
- HVAC specifications = 1.5 Ton Heat Pump w/integrated electric backup