

## High Performance Builder Spotlight

# Tindall Homes

Princeton, New Jersey



### Greener in the Garden State

In 2003, Mark Bergman, who is the founder of Tindall Homes based in Princeton, New Jersey, linked up with the U.S. Department of Energy's Building America IBACOS team to design a pilot house for his Legends at Mansfield development in Columbus, New Jersey, with hopes of achieving even higher energy savings on his all-energy efficient development.

“Our homes cut energy use by 50% to 55% over houses built to the state code. Over the lifetime of the house, our (Tindall) homes will save more in energy costs than the purchase price of the house. If we all did this, we could make a big difference.”

MARK BERGMAN - TINDALL HOMES

Before construction began on the Legends at Mansfield homes, IBACOS analyzed two “base case” homes built by Bergman elsewhere.

“We started building ENERGY STAR® five years ago. For the past two years we've built 50% to 55% better than code, almost twice as energy efficient as the New Jersey ENERGY STAR requirements (which is 30% better than state code). We offer these energy-efficient features standard on all our homes” said Bergman.

### Innovations

Despite the already efficient homes, IBACOS came up with some suggestions for further improvements. In response, Tindall Homes built a pilot house that would be the model home for the 39-unit community. It features basement walls of a precast concrete foundation system with R-12.5 interior polystyrene insulation within the concrete wall cavities upstairs. There is a 3-inch-thick spray foam urethane insulation within the 2x6 exterior wall cavities making it a R-19 wall. The attic uses a combination of blown-in cellulose plus fiberglass batt insulation to achieve R-45. Greater sealing of penetrations together with the use of spray foam in the wall cavities helps achieve a continuous air barrier and an air-change rate of 0.10 ACH. A drainage plane layer is used over insulating foam sheathing and is correctly integrated with flashing which was properly applied around windows and door areas to promote shedding of water.

The house sports two optimally sized high-efficiency (92% AFUE) direct vent furnaces and 14 SEER air conditioners. A direct vent gas tankless water heater provides hot water. The entire air distribution system is located in conditioned space with ducts traveling through an open web joist system. A central, fully ducted return system serves each floor with transfer grilles in bedroom walls, allowing for the transfer of air from bedrooms to the return system. The total air distribution system air leakage target is 10% of system airflow, with no air leakage to the outside. A heat recovery ventilator provides balanced mechanical ventilation. These features have been incorporated into all 39 homes in the development and many also sport 2.64-kW photovoltaic systems

### BUILDER PROFILE

Tindall Homes

[www.tindallhomes.com](http://www.tindallhomes.com)

Founded: 1986, New Jersey

Employees: 10

Number of Homes per Year:  
40 to 50 homes a year

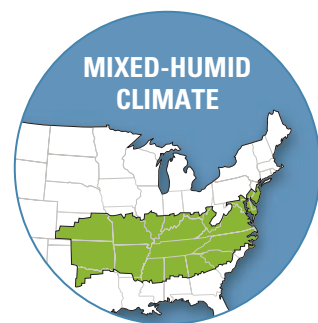
Energy Commitment: ENERGY STAR  
qualified, 50% better than code.

Development: Legends at Mansfield,  
Columbus, NJ

Size: 39 homes, 3,800 to 6,000 sq ft,  
(4 and 5 bedroom, 3 to 4.5 bath)

Price Range: \$759,000 to \$924,000

This builder is described in Building  
America's Solar Best Practices.



U.S. Department of Energy

**Energy Efficiency  
and Renewable Energy**

Bringing you a prosperous future where energy  
is clean, abundant, reliable, and affordable



New Jersey builder Mark Bergman combined Building America building science know-how and a personal commitment to energy efficient construction to achieve energy savings of 46% over the Building America benchmark home. (Above) Wiring for the photovoltaic system runs underground from the sheds to the houses.

KEY FEATURES

R-10 exterior foam conditioned basement

2x6 walls, R-20 open-cell spray foam

Windows: U=0.16, SHGC=0.61

Attic: vented, R-30 batt and R-20 blown-in

Airtightness: 1.5 ACH50

50cfm heat recovery ventilation

96% AFUE natural gas furnace, 18 SEER air conditioning unit

Gas instantaneous water heater

100% fluorescent lighting

2.64 kW Photovoltaic systems available

mounted on the roof of a detached garden shed that can be oriented for optimal solar gain.

IBACOS ran EnergyGauge USA software version 2.1 to calculate end-use and determined that the pilot home built to the design specifications (not including the contribution of the photovoltaic system) would save 46% with respect to the Building America benchmark house.

Dollars and Sense

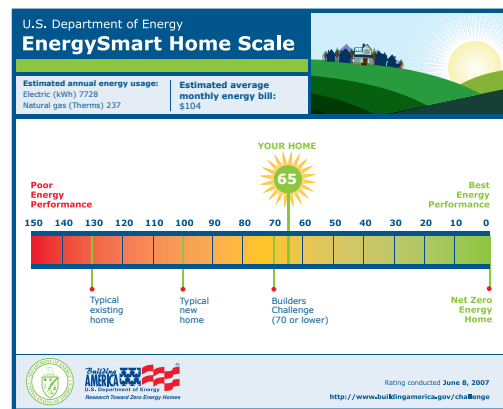
IBACOS estimated that energy efficiency improvements that Tindall had incorporated into the home would enable home owners to achieve an energy cost savings of 32% or \$1,122 over a similar home built to the Building America benchmark (based on an average electricity rate of \$0.101/kWh and a gas rate of \$0.8798/therm). Over the lifetime of the house, our (Tindall) homes will save more in energy costs than the purchase price of the house,” said Bergman.

U.S. Department of Energy Builders Challenge

DOE has posed a challenge to the homebuilding industry—to build 220,000 high performance homes by 2012. Homes that qualify for this Builders Challenge must meet a 70 or better on the EnergySmart Home Scale (E-Scale). The E-scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others. Through the Builders Challenge, participating homebuilders will have an easy way to differentiate their best energy-performing homes from other products in the marketplace, and to make the benefits clear to buyers.

The figure to the right shows an E-Scale example. The E-scale is based on the well-established Home Energy Rating System (HERS) index, developed by the Residential Energy Services Network. To learn more about the index and HERS Raters visit [www.natresnet.org](http://www.natresnet.org).

To learn more about the Builders Challenge and find tools to help market your homes, visit [www.buildingamerica.gov/challenge](http://www.buildingamerica.gov/challenge).



For more information visit [www.buildingamerica.gov](http://www.buildingamerica.gov). The website contains expanded case studies, technical reports, and best practices descriptions.

The Building America Program

Building America is a private/public partnership sponsored by DOE that conducts systems research to improve overall housing performance, increase housing durability and comfort, reduce energy use, and increase energy security for America’s homeowners. Building America teams construct test houses and community-scale projects that incorporate systems innovations. The teams design houses from the ground up, considering the interaction between the site, building envelope, mechanical systems, and other factors, and recognizing that features of one component in the house can greatly affect others. More than 40,000 energy-efficient houses have been built by the seven teams to date.