Building America Case Study
Whole-House Solutions for New Homes

Urbane Homes

Louisville, KY

PROJECT INFORMATION

Construction: New home

Type: Single-family

Builder: Urbane Homes,
Gilbert & Zane Underwood, Louisville, KY
(502) 509-7373
www.myurbanehome.com

Size: 1,484 to 6,000 ft^2

Price Range: $150,000 to $450,000

Date Completed: 2011

Climate Zone: Mixed-humid, IECC 4A

Team: NAHBRC

PERFORMANCE DATA

HERS Index: 57 to 62

Projected annual energy cost savings: $713

Added first cost of efficiency measures: $1,612

Annual mortgage increase: $129

Annual net cash flow to homeowner: $584

Billing data: Not available

When Urbane Homes was founded in 2007, the downturn in the housing market was just beginning and the owners Abe Gilbert and Zane Underwood realized they would have to make their homes very affordable to survive. They worked with the National Association of Home Builders Research Center, a Building America research partner, to streamline their building practices and decided to make their homes more efficient as well. Their goal was to "pick all the low-hanging fruit for green and energy-efficient design and put it in a standard package that made sense and was affordable," according to Gilbert. Their first home cost $36 per square foot (not including the lot) compared to a typical Louisville construction cost of $55 to $85 per ft^2. Their homes also achieve HERS scores of 57 to 62, and according to the owners, with no paid advertising they have sold every house they built in three weeks or less.

Urbane's standard package includes some off-the-shelf but less common features like rigid foam instead of OSB sheathing, advanced framing, and ducts routed through open-web floor trusses in conditioned space. They reduced construction costs by using a frost-protected shallow foundation, which allows the footing or foundation depth to be reduced from 48 inches to 12 to 16 inches, reducing the amount of concrete needed by two-thirds. The underside of the entire slab is insulated with 1 inch (R-5) extruded polystyrene (XPS) foam; the exterior foundation is protected by 2 inches (R-10) of recycled expanded polystyrene (EPS) foam; and the interior slab edge is insulated with 1¼ inch (R-5) of EPS foam.

High-efficiency windows and lighting and ENERGY STAR dishwashers, refrigerators, clothes washers, and ceiling fans increase the efficiency. A passive radon-protection system is installed. Deep overhangs reduce summer solar heat gain and keep snow off porches and sidewalks.

(Photo top left) The walls use advanced framing with 2x6 studs at 24 inches on center and XPS rigid foam sheathing on exterior walls instead of OSB. The XPS rigid foam sheathing is taped at the seams and covered with house wrap to provide a drainage plane, air barrier, and thermal barrier.

KEY ENERGY-EFFICIENCY MEASURES

HVAC:

- 8.4 HSPF, 14.5 SEER heat pump
- Ducts in conditioned space with less than 5% leakage
- Runtime positive ventilation system
- Kitchen and bath fans vented to outside

Envelope:

- Advanced 2"x 6" wood framing at 24" on center
- Attic insulation: R-50 blown fiberglass
- Wall insulation: 1" (R-5) XPS foam sheathing, R-19 fiberglass batts
- Foundation insulation: 1" (R-5) XPS below slab, 2" (R-10) EPS exterior foundation, 1¼" (R-5) EPS interior foundation
- Homes with basements: 2" (R-10) EPS exterior, R-13 fiberglass batts in interior walls
- Windows: Vinyl-framed, double-glazed, low-E with argon fill (U-0.32, SHGC=0.31)
- Blower door test: Less than 3.6 ACH50 (~0.15 ACHnat infiltration)

Lighting, Appliances, and Water Heating:

- 100% CFL
- ENERGY STAR® appliances
- 0.92 EF electric tank hot water heater

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www.buildingamerica.gov

Urbane Homes worked with NAHB researchers to develop a shallow foundation that reduces excavation and concrete costs. Rigid foam is used as a leave-in-place form insulating the interior and exterior sides of the footing and foundation walls so footings don't know need to be below the frost line.

Lessons Learned

- Urbane Homes uses XPS rigid foam instead of oriented strand board (OSB) for sheathing to improve the moisture resistance of the exterior walls.
- Ducts are installed within the conditioned space in open-web floor trusses between the floors.
- A shallow foundation protected by rigid foam cuts excavation and concrete costs.
- To ensure adherence to quality standards, Urbane Homes holds pre construction meetings with trades and the site superintendent, provides training sessions for its subcontractors, and developed a manual for its framers (who do most of its air sealing); the manual is updated whenever improvements are made to its processes.

"We set out to prove that we could build a really good house for an affordable price, and we built that first house for $36 per square foot (not counting the lot)."

Abe Gilbert, co-owner, Urbane Homes

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

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www.buildingamerica.gov

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