

Hot, Humid Climate Region 40+% Energy Savings



Evening Rose

Tallahassee, FL

Developer/Owner:	K2 Urbancorp, LLC.
Location:	Tallahassee, FL
Building Type:	Single Family Detached
Building Size:	2,000 - 2,500 sq ft
	3-4 bedrooms, 2.5-3 baths
Price:	\$360s and up
Status:	5 completed, 99 total lots
SWA Contact:	Srikanth Puttagunta

CARB partnered with K2 Urbancorp, an award-winning home builder and real estate developer in Tallahassee, FL. K2 Urbancorp, founded in 2002 by David B. Wamsley, Fincher W. Smith and Timothy A. Jamieson, is building historically inspired homes with pride, passion, and attention to detail. The company introduced its first product line, authentically designed and crafted bungalow style homes and cottages, in 2003.



Evening Rose, Tallahassee's first Traditional Neighborhood Development (TND) will feature 99 homes upon completion as well as a walkable, pedestrian friendly mixed use village center adjacent to a variety of office, restaurant and retail establishments. This development spans 36 acres located inside Capital Circle, just moments from the heart of downtown Tallahassee.

“Our company seeks to reform new and existing real estate developments into pedestrian friendly environments, much like the most treasured, friendly neighborhoods from the turn of the century. By focusing on superior design principles, it is possible to create more walkable, open communities that help to reduce urban sprawl, encourage social interaction and make for a more attractive place to live, work and play.”

The initial homes built met the 40% whole-house source energy savings (comparable to mid-1990s construction). To achieve the desired reduction in energy use, SWA focused primarily on tightening the building envelope and sealing ductwork. The ductwork was not able to be brought into the conditioned space, but duct leakage was minimized.

ENERGY EFFICIENT FEATURES

- Silverline IG LoE2 windows (U-0.35, SHGC-0.34)
- Blown-in fiberglass insulation (R-30) in attic
- Blown-in fiberglass insulation (R-15) in 2x4 walls
- Spray-in-place polyurethane foam insulation (R-6.75/inch) rim/band joists
- Uninsulated slab-on-grade
- Trane heat pump (SEER 14 / 8.2 HSPF)
- Rinnai exterior-mounted tankless water heater (EF=0.82)
- 50% compact fluorescent lighting
- Energy Star® Appliances
- Supply-only ventilation
- Mastic-sealed ductwork
- Programmable thermostat with adaptive recovery

GREEN BUILDING FEATURES

- Water-saver faucets and showerheads
- Low-VOC paints and caulks
- Drought resistant landscaping / rain gardens

CERTIFICATIONS

- Exceeded BOP Energy Star® Homes Standards
- LEED® for Homes (Silver certification)

<http://www.k2urbancorp.com/eveningrose/>



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The Building Shell Is Priority #1



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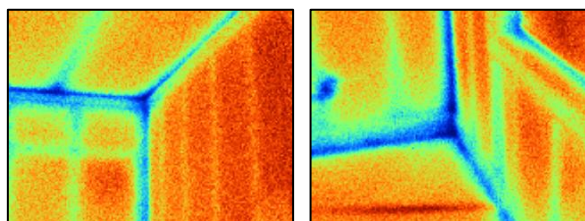
K2 Urbancorp has been focusing on three primary areas of building performance: (1) Energy Efficiency, (2) Durability, and (3) Indoor Air Quality.

In 2007, CARB identified a number of improvements needed to achieve a 40% total source energy savings over the "Building America Benchmark Definition" while addressing these three keys areas:

1. Tightening of the Building Envelope (Energy Star Thermal Bypass Checklist, Blown Cavity Insulation, Spray Foam Insulation)
2. Proper Design and Sealing of the Air Conditioning System
3. Reduction of Solar Heat Gain Through Glazing (Low-E Windows)
4. Equipment/Appliance Efficiency Upgrade (Tankless Water Heater, Energy Star Appliances, 50% CFLs and 100% Energy Star Ceiling Fans)

Building Envelope

CARB continued to work with K2 Urbancorp on methods to reduce building infiltration. Infrared imaging from the model home in the development showed a significant amount of leakage from the bottom sill plate and top plate.



By applying a bead of construction adhesive to all top and bottom plates just prior to hanging drywall, it helped ensure that the air barrier was continuous and minimized leakage.

BUILDING ENVELOPE TEST RESULTS:

Airflow at 50 Pascals: 2356 cfm₅₀
(50 Pa = 0.2 in. w.c.) 8.75 ACH₅₀
0.52 ACH_{natural}

Leakage Areas: 122 in² (LBL Effective L.A. @ 4 Pa)
235 in² (Canadian Equivalent L.A. @ 10Pa)

Building Leakage Curve:
Flow Coefficient (C) = 170.14
Exponent (n) = 0.6718
Correlation Coefficient = 0.9993

Test Mode: Depressurization
of Stories: 2
of fireplaces: 1
Floor Area: ~1900 ft²
Total Volume: 16,150 ft³

Envelope Infiltration

Unit	Tight	Moderate	Leaky
ACH ₅₀	< 4 ACH ₅₀	4-7 ACH ₅₀	> 7 ACH ₅₀

HVAC TEST RESULTS:

Duct leakage at 25 Pascals:
System #1 total duct leakage: 323 / 24%

Duct Leakage to the Outside

Unit	Tight	Moderate	Leaky
% leakage	< 5	5 - 15	> 15

Problem Areas:

Summary of Test Findings

- Need to address thermal bypasses
- Need to bring ductwork within conditioned space
- No atmospheric combustion water heaters
- Gasket attic hatch
- Air barrier on back side of knee walls
- Central return is too small (whistles)
- No unvented gas fireplaces
- For programmable thermostat, need "adaptive recovery"
- Air filter can not be removed

After initial testing was done, CARB worked with K2 Urbancorp to identify the sources of energy waste within their current building practices and worked with the contractors to implement more sound construction practices that addressed these issues. The main issue was that each home was being completed in a slightly varying manner from the previous. By setting a protocol that could be incorporated into any home design, it allowed for better quality control for the remainder of the build out.

