



Building America Efficient Solutions for New Homes

Case Study: Tom Walsh & Co.

New Columbia | Portland, OR

PROJECT INFORMATION

Construction: New home

Type: Single-family

Builder:

Tom Walsh & Co. (TWC), Portland, OR
(Ben Walsh now owns Green One
Construction Company)

Size: 20 homes, 1,884 ft² average

Price Range: \$199,000 to \$278,000

Date Completed: 2008

Climate Zone: Marine, IECC Zone 4

Team: Building Industry Research
Alliance (BIRA)

PERFORMANCE DATA

HERS Index: 59-66

**Projected annual energy
cost savings:** \$944

**Added first cost of energy-
efficiency measures:** \$2,398

Annual mortgage increase: \$191

Annual net cash flow to homeowner: \$752

Billing data: Not available

In 2007, Tom Walsh & Co. (TWC) became one of the first production builders in Oregon to earn the \$2,000 federal tax credit for new energy-efficient homes. TWC earned the tax credit on 20 new homes built in the New Columbia neighborhood in Portland, Oregon. These homes earned Home Energy Rating System (HERS) scores that represent greater than 50% energy savings in heating and cooling over the 2004 International Energy Conservation Code (IECC). Building America, through its Building Industry Research Alliance (BIRA) team, provided technical analysis to help TWC achieve such significant energy savings.

In total, TWC built 46 speculative, detached, single-family houses in New Columbia priced between \$199,000 and \$278,000. All of the homes sold by March 2008. For the 20 homes earning the tax credit (from phase II of the project), Ben Walsh, the project manager and an owner, credits two changes with providing most of the energy efficiency: improving air sealing and moving ducts out of the crawlspace and into conditioned space.

“We put a lot more attention into gasketing the crawl and attic access hatches,” said Walsh. “We took care to instruct our insulators to foam the bottom plates...and top plates of the walls. Then, we caulked around all the penetrations—the wires, pipes, ducts.” According to Building America’s BIRA analysis, the estimated incremental time to implement this extra sealing was only 1.5 hours per house.

Data analysis (which was implemented in the builder’s phase II construction bid) showed that placing the ducts in conditioned space and not the crawlspace saved \$275 per house. The central location of the furnace inside a closet made it possible to use 40% less ductwork than would have been needed if the system had been installed conventionally.

KEY ENERGY-EFFICIENCY MEASURES

HVAC:

- 94% AFUE gas furnace in an interior closet, no AC
- Mastic-sealed R-8 ducts in conditioned space
- Bath exhaust fan and trickle vents in the windows

Envelope:

- 2x6 24-inch on-center advanced framing
- **Attic insulation:** R-49 blown-in cellulose
- **Wall insulation:** R-21 batts
- **Foundation:** Vented crawlspace with R-38 batts in floor joists
- **Air sealing:** Gasketing the crawl and attic access hatches, foaming the bottom and top plates of the walls, and caulking all penetrations
- **Windows:** Double-pane, $U = 0.29$

Lighting, Appliances, and Water Heating:

- 100% compact fluorescent lighting
- 62% efficient gas water heater
- ENERGY STAR® refrigerator, dishwasher, and clothes washer

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The arched entry adds aesthetic appeal and hides the ductwork, which is kept in conditioned space to increase energy savings.

Also, there were no additional framing costs as a soffit containing the ductwork was already required to conceal a structural beam. The soffit was enlarged beyond the needs of the ductwork as an architectural feature of the entryway. Duct blaster testing showed duct air leakage of 31 to 40 CFM 50.

Ventilation is provided with a timer-operated bathroom exhaust fan and trickle vents, which are small, operable vents located within the window frames.

Lessons Learned

- Increased energy efficiency can provide a competitive sales advantage. The realtor, Chris Bonner, said: “I listed all 46 homes. In phase I, when we were Earth Advantage and ENERGY STAR rated, we were competitive with the other builders at New Columbia. So, we were all out there singing the same song. Then, on the second phase [the 50% energy savings homes], with having increased energy efficiency, it let us really stand out from the competition.”
- Energy efficiency does not have to cost more. When moving the ducts into conditioned space, TWC saved \$275 per house by locating the furnace inside a closet and running the ducts inside existing soffits. These changes reduced overall duct length by 40%.
- Design is important. At the sidewalk level, houses have front porch areas that encourage neighborly interaction. Off-street parking is located in alleys behind the housing. Windows in living rooms and kitchens face the streets and alleys so residents know what is happening on their street.

“Ben [Walsh, project manager and an owner] has been on the phone countless times with ‘what ifs’ [related to improving energy efficiency], so we have gone back to our Building America partners to answer these questions.”

Brady Peeks, energy analyst for the Oregon Department of Energy