



Building America Case Study Whole-House Solutions for New Homes

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

Tom Walsh & Co. worked with the U.S. Department of Energy's Building America program, through its Building Industry Research Alliance (BIRA) team, to achieve significant energy savings on 46 homes in the New Columbia neighborhood in Portland, Oregon. Twenty of the homes were built in phase two of the project with the goal of earning the \$2,000 federal tax credit for new energy-efficient homes. These homes also earned Home Energy Rating System (HERS) scores of 59 to 66.

The single-family, detached homes were priced between \$199,000 and \$278,000 and all of the homes sold by March 2008. Project manager Ben Walsh 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 analysis by BIRA, the estimated incremental time to implement this extra sealing was only 1.5 hours per house.

BIRA analysis also 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.

There were no additional framing costs for installing the ducts in conditioned space in a ceiling soffit as a soffit already existed in the design to conceal a structural beam. The soffit was given an arched shape at the entryway as an architectural feature. Duct blaster testing showed duct air leakage of 31 to 40 CFM 50.

(Photo top left) Tom Walsh & Co. achieved HERS scores of 59 to 66 on 20 homes in Portland, Oregon, with technical assistance from the Building Industry Research Alliance (BIRA), a research team leader in the U.S. Department of Energy's Building America program, and from Earth Advantage, the Energy Trust of Oregon, and the Oregon Department of Energy.

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

For more information, please visit:

www.buildingamerica.gov



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

Ventilation was provided with a timer-operated bathroom exhaust fan and trickle 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, in the second phase having increased energy efficiency 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, the 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, the 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

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