DOWN EAST RETROFIT

Superinsulating a sprawling fuel-gobbler wasn't enough: stemming elusive air leaks was a vital second step in gaining major energy savings.

By Steve Bliss

In the summer of 1981, mechanical engineer and air-quality researcher William Turner bought a heat-leaking house 40 miles northwest of Portland, Maine. Built in 1926 as a summer home for a Broadway playwright, the 3600-square-foot wood-frame house had never been insulated. The builder's effort went instead into grand design and distinctive finishes: most rooms sport floor-to-ceiling wainscoting and tongue-and-groove wooden ceilings.

To make the house heatable for the first winter, Turner started on the inside. He tore down the wooden cladding on walls and ceilings and added heavy insulation. With a crew of three, he added 2x2's to the studs, and stuffed the wall cavities with 6-inch batts. Next, the crew rolled poly out on the walls—lapping it one full stud at seams—and installed an inch of Thermax rigid insulation, horizontal strapping 16 inches on-center, and ½-inch drywall. They ran the wiring in the ¾-inch strapping space.

All the walls got this R-26 superinsulation system, except a few spots where bookshelves and built-ins were in the way. These areas were blown with cellulose and caulked on the interior.

The house had a sweeping cathedral ceiling on the north side, and a full attic on the main roof. On the cathedral ceiling, the 2x6 rafters were deepened with 1x2's, then insulated with R-19 batts, leaving a small air channel above the insulation. In the attic, a 10-inch layer and a 6-inch layer of fiberglass batts were installed at right angles to each other.

Turner placed strips of aluminized building paper and poly between the joists, believing at the time that foil strips would serve as an adequate vapor barrier. "I got conflicting advice on

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