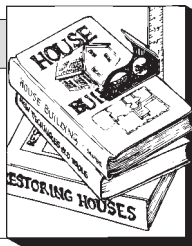


Energy Resource

Energy Design Update Residential Building Design & Construction Workbook by J. D. Ned Nisson (Cutter Information Corp., 1988; 800/888-8939). 347 pages. Perfect bound. 8 1/2 x 11. \$95.

by Paul Hanke



If you're like me, you've never had time to organize the notebooks full of assorted information on energy-efficient design and construction you've accumulated over the years. And, even though you need the information published in *Energy Design*

Update (EDU), the excellent newsletter edited by Ned Nisson, you may have also decided not to spring for the hefty subscription price.

Nisson's *EDU Residential Building Design & Construction Workbook* is the answer to your dilemma. It pulls together an enormous amount of data and analysis, reprinted from EDU and other sources, and repudiates a number of energy conservation myths.

Nisson begins with a synopsis of the characteristics and advantages of superinsulated construction. He discusses heat loss due to conduction, infiltration, and ventilation (or "controlled leakage") and explains exactly how to calculate heat loss and infiltration. (Incidentally, this, and a very detailed account of blower door testing, is as close as the book gets to being a "workbook.")

On the subject of moisture control, Nisson contrasts convection (air leaks) and diffusion as mechanisms for moisture movement (leaks dominate), and defines the difference between "air" and "vapor" barriers. He also reviews the "1/3-2/3 rule" for vapor barrier placement, and describes proper sealing and detailing of joints with tape or non-hardening sealants.

The exhaustive 84-page section on air/vapor barriers by Energy, Mines & Resources Canada is packed with details for every conceivable component of residential construction. Nisson follows up with a well-illustrated discussion of the "airtight drywall approach" to sealing houses, which uses gaskets, caulks, and painted drywall instead of the fanatical poly detailing described earlier. There's also an apples-to-apples comparison of the properties and performances of various brand-name "housewraps."

The sections on walls, roofs, ceilings, and foundations compare seven superinsulated wall designs for R-value, thermal bridging, air tightness, cost, and ease of

construction, and present research from the Forest Products Laboratory that dispels the notion that foam sheathing on the outside of a wall can cause condensation in cold climates. But the issue of potential siding

failure over foam sheathing is omitted. Nisson's discussion includes details for fully insulating the heel of a rafter or truss and sheds light on the question of when (and when not) to use an unvented ("hot") roof.

The section on windows mixes topics like heat-loss physics, glazing types, and infiltration with some interesting tidbits, such as research findings indicating that, in some cases, low-e glazing has an "insignificant" effect on a window's overall thermal performance. There is also a good analysis of why a window's field performance may vary significantly from calculated R-values.

The final chapters give an overview of ventilation, air quality, and heating and cooling, but the best part of the book is the appendix on insulating materials. You'll find a lot of useful information in its 65 pages, like how compressing fiberglass affects its R-value, whether real-world insulating values vary from manufacturers' ratings, and why "short circuits" in fiberglass insulation are more critical in roofs than walls.

Unfortunately, the book has no index and some of the information seems dated. For instance, current research shows that sub-slab insulation should be gradually reduced as you move away from the building perimeter. Consequently, I was a bit baffled by Nisson's contention that 2 inches of sub-slab insulation *plus* 2 inches outside the frost wall is "most effective." Why? Nisson presents no supporting data.

Despite these minor flaws, *Residential Building Design & Construction Workbook* is an excellent resource from a very knowledgeable, responsible, and reliable commentator. I consider myself up to speed on energy issues, but I still learned plenty from this book. ■

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