



by Paul Hanke

Nearly 500 men and women attended sessions on topics ranging from "Detailing Today's Envelope" to "Swedish Housing" at the March 15-16 conference of the Quality Building Council of the Northeast Solar Energy Association (NESEA, formerly the New England Solar Energy Association) in Hartford, Conn.

The conference opened with a cheerful welcome by Christine Donovan of NESEA, after which Steve Bliss of *Solar Age* magazine gave a brief overview of solar and energy-conscious housing in North America.

Using slides to illustrate both aesthetic and unaesthetic examples, he presented an often humorous portrait of Solar America. One noteworthy slide showed a humble VW beetle parked in front of an equally undistinguished solar house. Bliss wryly noted that despite the resemblance, solar still has not achieved the market penetration of the Beetle.

The presentation of the next speaker, Yale architect Don Watson, was quite similar in content to that of Bliss, and personally, I'm not sure how many more slide shows on the "history of solar" I can endure. However, Watson did offer a couple of points worth noting. First, he maintained that there is not enough sun in New England, where it is cloudy 50 percent of the time, to justify the cost of added mass in solar buildings. Second, he emphasized the importance of architect/engineer teamwork for successful design.

Moving on, the morning plenary session closed with a talk by NEB's own Mike Reitz, who, for better or worse, had no slides to show. Reitz offered his thoughts as "an observer" of the building scene, focusing on such emerging trends as the government's exit from housing programs, the lack of skilled labor combined with poor training programs, and changing market demographics.

Not only will the declining federal role in housing, combined with the Gramm-Rudman-Hollings amendment, serve to make housing even less affordable than today, Reitz said, but he predicted that additional headaches will be created by shifting regulatory roles to the local level. If builders aren't active in their local builders' associations already, Reitz urged them to get involved.

Reitz also touched upon the declining "starter" market, predicting that manufactured housing eventually will take over the bulk of the entry-level units, and pointed to retirees and the 35- to 45-year-old "baby boomers" as the real growth market. One of the "most curious" changes he's observed in the industry has to do with wood, which he noted is becoming more of an engineered product (wooden I-beams, glue-laminated timbers and fabricated panels, for example).

Before lunch, I took a whirlwind tour of the exhibits in two postage-stamp-sized rooms (failing to discover a third room of exhibits until the displays were being dismantled late Saturday). This oversight could be attributed to my state of mind at the time, but some "signage" (as we say in the design profession) would have helped.

The exhibits I did see were modest and not particularly new or interesting. Perhaps the most innovative product on display was the

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new Canadian surface-bonded Sparfil concrete block. This lightweight, insulated block is 60 percent styrofoam with optional foam inserts for the core, and it can be cut easily with a handsaw.

## Roofs and Attics

After lunch we had to choose between two competing sessions—one on windows and doors and another on roof systems. I picked

vents, which apparently solved the problem!

When questions were taken from the floor, Liz Fox of the Massachusetts Cooperative Extension Service noted that Canadian building scientist Joe Lstiburek believes that venting is unnecessary in cold climates, provided the house has "heavy" (R-40 or better) ceiling insulation and a good air/vapor barrier. In response, Hughes noted that it was a moot point, since no building code he

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the latter.

Both sessions were delayed by what may very well be the solution to the dilemma of two-track conferences: Somehow the microphone wires got crossed between the two sessions, literally making it possible to see one session while hearing the other. (Future conference organizers, take note!)

After the logistical snafu was resolved, Chuck Silver of Solarplexus in New Paltz, N. Y., presented slides of different roof-construction systems and details taken from his own experience. Highlights for me were details on site-built I-beams relevant to a job of my own, and a parody slide of a cover of *Fine Homebuilding* retitled "Insane Homebuilding" (which Silver said might be a good place to publish some of his building experiences).

One of the specifics he noted is that Guardian now is making a 3½" R-15 fiberglass batt that reportedly costs 40 percent more than the conventional R-11 version. The product is described in the latest issue of *Energy Design Update*.

Following a similar presentation by James Williams of Brattleboro, Vt., Canadian John Hughes addressed the subject of attic ventilation. Most of what he had to say would be old hat to regular readers of *NEB*, but he provided some graphic examples of the kind of problems caused by moisture condensation above ceilings in very cold climates.

One of his slides showed ice *stalactites* hanging from rafters, while another showed mushroom-like "frost boils" where vapor had escaped through cracks around plumbing vents. Hughes admonished that it's much better to contain the vapor in the first place than to provide "massive venting" after the fact.

The conference "bombshell" came at the end of Hughes' presentation, when he showed the "mandatory illegible conference graph" (would that it were the only one!), taken from research by Peter Cleary at the Lawrence Berkeley Laboratory in California. The upshot was that roof venting may not be necessary at all—at least in coastal California.

Hughes further supported this argument with anecdotal evidence from researcher Harold Orr of Saskatoon, Canada, who reportedly tried in vain to solve an attic condensation problem by venting "until hell wouldn't have it." Finally Orr sealed all the

vents, which apparently solved the problem!

## Cost-Saving Techniques

I chose the session on cost-reducing construction techniques over one on foundations to close out Friday afternoon. It proved to be a lively and controversial session. Participants at each table were provided with photocopies of construction drawings illustrating the techniques presented during a brief introduction by Art Boyce of New

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England Thermal Energy Consultants in Narragansett, R.I.

As it turned out, the techniques were the optimum value engineering (OVE) methods developed by the National Association of Home Builders (NAHB). Boyce's overview was intended to generate discussion of cost-reducing ideas in general, but instead his introduction (and the techniques themselves) produced a great deal of controversy focusing on OVE itself. This made for lively give and take, but it definitely generated more heat than light.

Overall, the builders present seemed to view the OVE techniques—such as engineered 24" o.c. framing, single top plates, the absence of floor bridging, 2x3 partition walls, and especially the use of 3/8" stress-rated plywood for roof sheathing—as sacrificing quality for nickel-and-dime savings.

As one fellow put it from the floor, "OVE methods seem most suitable for starter housing, which we've already been told is going to be taken away by manufactured housing."

Another, noting that the conference was aimed at custom builders and quality building, asked, "Why give us this stuff?" Another builder observed that Boyce had said he wouldn't use OVE on his own house. "Isn't that a measure of what you want to build for others?" he asked. (Among the snappy repartee from the floor: "What did the original OVE house sell for?" Answer: a facetious "It hasn't sold yet!")

Some individuals did seem to pick up some useful ideas from OVE—such as the use of drywall clips (available from Teco and Simpson Strong Tie) or the elimination of headers in nonbearing walls—but others voiced resistance even to the idea of 24" o.c. framing, which seems fairly mainstream to me.

Boyce responded to the criticism of OVE by saying that builders could be selective. ("Take the 'kit' and leave the 'caboodle' behind," as he put it.) Others countered that if overall OVE savings are only 12 percent as reported, selective use would drastically reduce that. Then again, it might be said that even a 6 percent savings on a \$200,000 house could buy such highly marketable amenities as sunspaces or spas, while OVE features would be hidden behind the drywall for the most part.

Unfortunately, rather than generating a lot of other cost-saving ideas from participants, the discussion got bogged down on a critique of OVE. A few other ideas did emerge, however, such as the use of polybutylene pipe for plumbing. Then there was the quip by session chairman Terry Brennan that "going 'illegal' (without insurance, for example) could save me 20 percent, which is a lot better than 12 percent."

Personally, I picked up some practical information on the pros and cons of Onduline corrugated asphalt roofing from a woman and a man at my table who each had used it for a barn. I also was interested in learning how some builders spray urethane foam between 2x4 studs for high R-value and tight sealing, though I doubt whether this cuts cost much.

## Siting for Solar

Saturday's sessions opened with a plenary on "Optimizing Conservation and Solar." Speakers included regional planner Charles Vidich, architect Bill Bobenhausen, and Russell Johnson of Northeast Utilities.

Vidich led off with a slide presentation on how to use site planning for maximum solar advantage, noting that simply facing a conventional tract house south can translate into a 136 percent savings in energy. Clearing for a leach field on the south side can be an easy way of killing two birds with one stone, he added.

Vidich also noted that some jurisdictions now mandate that solar design be considered during the planning stage, while others are moving toward statutes guaranteeing solar access. While planned solar developments may lose some lots or have increased street lengths, developers might bargain for a few duplex units to compensate. In any event, he said, increased marketability might offset any extra cost.

## The Payback Issue

Johnson of Northeast Utilities (NEU) then spoke about "super-insulation economics," focusing on an NEU study of when super-

insulation can be expected to pay a positive return.

(It also should be noted that NEU has produced an excellent series of "Operation Solar" booklets on the planning and design of solar subdivisions. Written by Charles Vidich and Total Environmental Action, the booklets are useful resources for developers. Copies are free from NEU, Box 270, Hartford, Conn. 06101.)

Bobenhausen's subject was "Where Solar and Super-insulation Meet"—an interesting overview of his computer-modeling research that measures the cost-effectiveness of various conservation and solar features. Using a 2,000-square-foot, single-story "pre-energy-code house" as his base model, Bobenhausen used a computer to simulate the effects of such measures as 2x4 construction with one-inch foam sheathing, the addition of double glazing on the windows and finally tightening the house to 0.5 air changes per hour. Each configuration was analyzed four different ways, ranging from orienting the house (and half of the glass) toward the south to adding night insulation. The effect on the annual heating load also was modeled.

Southern orientation showed a "significant reduction in heating costs" at no extra expense and was "instantly justifiable," he said. Adding more glass on the south side produced marginal solar gains at a high cost. Night insulation significantly reduced the heating load, but at such a high cost that it would not be worthwhile unless energy expenses approached the cost of electricity. Copies of Bobenhausen's paper can be

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obtained from him at the Energy Design Collaborative in Scarsdale, N.Y.

Next, Jon Slote of Acorn Structures continued the discussion of cost-effectiveness at a session on wall construction and details. Based on a cash-flow analysis, Slote characterized "fat walls" (2x6 or double-stud walls) as a "savings account" (low economic risk and a low return), foam-sheathed walls as "money market accounts" (slightly higher risk), and "puncture free" walls as "growth funds," suited to clients who want "high performance and quality control."

But walls by themselves are *not* the most important issue in energy conservation, Slote noted. Infiltration control also is very important (as witnessed by the fact that an entire session was devoted to this subject later).

The walls session also included presentations by John Hughes on the Larsen truss, Cyrus Gibson on post-and-beam construction with stress panels, and architect John Rahill on detailing.

Reflecting on his first design/build job—a full-scale house built as an "addition" to a friend's A-frame—the self-effacing Rahill observed that "it was here I learned that *drawing* the details might be easier than building them." This drew an appreciative chuckle from the predominantly builder audience.

(Later Rahill asked how many in the audience had worked with architects. Many hands were raised, accompanied by a voice from the floor asking, "How many did it a second time?")

Interesting points from Rahill's talk included his observation that tapering foam insulation on the outside of a foundation wall (thickest at grade) might give frost a "handle" to grab onto, and his use of

quartered sono-tube sections to create round returns on the window jambs of his own house. Another bit of handy advice came from the floor: Use a serrated trowel to roughen the surface of blueboard prior to applying stucco; it's easier than a wire brush.

Meanwhile, over at the session on manufactured housing, a sizable group had gathered to hear about what may be "the wave of the future." Architect Ted Graves of Greenwich, Conn., sang glowing praises of Swedish imports, of which he has built several. Graves reported a factory price of \$17 per square foot (\$25 a square foot delivered to the site) and noted the Swedes' reputation for precision and punctuality. If I were considering breaking into this field, I certainly

panels.

But this time, a surprise "awards ceremony" took place before the dialogue started. Noting that "it takes real courage to stand up before a group of hostile people and defend something you really believe in," chairman Mark Kelly presented OVE "advocate" Art Boyce with a T-shirt—imprinted with "OVE" on the front and "3/8 inch" on the back—to the delight of the audience and the astonishment of Boyce himself.

Kelly then fired off some provocative questions to the panelists and the floor. Topics included the problem of ice dams on *vented* roofs (caused by melting and cured by Bituthene eave flashing), the fogging of Pella windows caused by "mud wasps" plugging

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would pick his brain about the choices available.

#### Air-Quality Techniques

Next came the aforementioned session on infiltration and ventilation. John Hughes kicked it off with a slide show and discussion of air/vapor barrier techniques, focusing primarily on the serpentine "over, under, around and through" polyethylene approach—sealing everything with "black death" (Tremco acoustical caulk).

After showing a slide depicting how to apply a poly strip around the edge of a factory-built window unit before installation, Hughes presented another picture that pointed out a major drawback to this whole approach: A sheetrock installer had completely destroyed the carefully detailed poly when he made a cut along the windowsill. Nonetheless, Hughes still doesn't accept the airtight drywall approach (ADA) as an alternative to poly.

Two other tips from Hughes' presentation are worth noting. First, common string can be stapled into joints between poly sheets as an alternative to caulk, and second, EPDM "log home" gaskets apparently should be used instead of a foam "backer rod" in ADA construction because the "rod" apparently does not expand after being compressed.

Terry Brennan then gave an often lighthearted overview of the serious subject of indoor air pollutants. Memorable slides included the aftermath of a tornado (illustrating a "severe infiltration problem"), a cat leaving its litter box (illustrating odor), and best of all, a bright glow of light emanating from a partially opened basement bulkhead (illustrating radioactive radon). Brennan's message: The source rate is much more important than ventilation in controlling pollutants; therefore, control the source first, then ventilate as close to the source as possible.

Later, Bob Porter of Anacortes, Wash., gave a fast-paced introduction to the nuts and bolts of installing air-to-air heat exchangers. Much of Porter's presentation was a bit over my head, but I still came away with several pieces of practical advice. One was his recommendation to use short lengths of flexible duct whenever air-exchanger ductwork enters a room (except a kitchen) to control noise transmission between rooms.

Porter definitely appeared to know his stuff, so it's too bad he didn't have more time. Catch him if you can at a future conference.

#### A Surprise Ending

The festivities in Hartford ended with a NESEA tradition—the Builders Forum. Ever since the first gathering in '83, this often lively format has fostered valuable exchange between conference attendees and a group of

the vent holes (apparently a common callback), the visual "swirling" and "fun-house effect" sometimes seen in low-E films and multiple glazings, and the use of spray urethane in stud cavities. One interesting comment that emerged: Leaving night insulation in place during the day can void the warranty on insulating glass windows.

NESEA generally puts on a pretty good conference, and this one was no exception. As always, it was nice to meet people and share insights and information. But to some extent, I couldn't help but feel that I seem to be going to more and more conferences to learn less and less. ■