Miscellany

Poll Takes Pulse of Building Technology

by Gopal Ahluwalia

There has been enormous technological improvement in the past 40 years in the construction industry. The improvement has come, for the most part, in little bits and pieces.

The following analysis reflects builders' responses to the 1987 Builders Profile Survey by the National Association of Home Builders (NAHB), as well as observations at the NAHB Research Foundation.

Foundation

Since 1969 over 300,000 homes have been built with permanent wood foundations, but that represents a small market share. Permanent wood foundations are being used mostly in colder climates, where concrete cannot be easily poured in the winter. Nine percent of the builders responding to the survey are currently using permanent wood foundations and another 13 percent are considering using them.

Framing and Sheathing

Since the early 1970s, the housing industry has been promoting "engineered" framing and sheathing methods, which often require less material. All major model codes now accept 24-inch-on-center framing, but builder acceptance has been slow.

Since many builders are switching to 2x6 exterior walls, 24-inch-on-center construction should be given a boost. Currently, 37 percent of the builders surveyed are using 24-inch spacing, 11 percent are considering it, and 49 percent decided against it. Exterior 2x6 walls are currently used by 63 percent of the builders surveyed, and 12 percent are considering using them.

The likelihood of non-wood frame walls ever becoming much of a factor appears slight at this time. Metal framing systems have enjoyed much more success in commercial construction than in residential. Foam plastic framing systems appear to be competitive with wood framing and offer some advantages, such as reduced erection time and better thermal characteristics. These systems may, indeed, find a niche in the market.

Manufactured floor trusses are becoming more widely used in residential construction. They offer longer clear spans, thereby increasing interior room layout flexibility, and provide room for wiring and plumbing without drilling or cutting holes. They generally do not require center beam or bearing wall support, but are usually more expensive than regular wood joists and use more vertical space. Floor trusses are currently used by 62 percent of the builders responding to the NAHB survey and another 20 percent are considering using them.

Energy concerns have prompted use of a wider variety of wall sheathing materials in recent years. Foam plastics and foil-faced boards have replaced asphalt-impregnated board and plywood sheathing in several regions. Foam sheathing is currently used by 75 percent of the builders in the survey, and 8 percent are considering it.

Adhesives have become widely used, especially for applying single layer floor sheathing and drywall. It is likely that more adhesives will be used in the future. About three-fourths of the builders reported using glued-nail construction.

Plumbing

Plastic pipe has become the predominant material in drain, waste, and vent plumbing for residential construction. CPVC water supply piping has met with limited success because of inherent problems with water pressures and temperature range restrictions. However, a relatively new material, polybutylene, has apparently overcome these problems and is becoming widely used for water supply piping.

Heating, Ventilating, and Air Conditioning

Furnaces with 80 percent or greater efficiency are currently used by 81 percent of the builders and 9 percent are considering using them. Condensing furnaces are used by 28 percent of the builders responding and 15 percent are considering using them, while 42 percent do not know about condensing furnaces. Solar-assisted water heaters are currently used by only 18 percent of those surveyed but 24 percent are considering using them. Plastic vapor barriers are currently used in walls by 73 percent and in ceilings by 49 percent of the builders.

Electrical

One of the more difficult codes to change is the National Electric Code, primarily because of safety concerns. Residential electric wiring is at least two generations behind the state-of-the-art. Low-voltage wiring, quick-connect junctions and outlets, surface-mounted flat cable, power-on-demand devices, computerized load control, etc., will, no doubt, become part of the way homes are wired in the future.

Other findings regarding current use of materials and methods from the 1987 Builders Profile survey are as follows:

- Newer techniques and materials in common use include laminated veneer lumber (54 percent) and waferboard/OSB sheathing panels (60 percent). Composite wood beams are used by 37 percent of the builders but 21 percent do not know about them. About one in nine builders does not know about laminated veneer lumber, truss-framed homes, or construction with no cross bridging.
- The more commonly used prefabricated components are prehung doors (95 percent), roof trusses (86 percent), and floor trusses (62 percent). Prefabricated open wall panels and closed wall panels are used by only 15 percent and 10 percent of the builders respectively. About one-fourth of the builders do not know about prefabricated wall panels and about 40 to 45 percent have decided against using them.
- Automatic nailing devices are used by 87 percent of the builders and another 6 percent are considering using them. Cordless power tools are used by 83 percent of the builders and another 8 percent are considering them.
- Conventional stick-built construction is likely to continue to be the dominant mode, but more and more builders will take advantage of factory-produced components or panelized construction processes.

The process of change and adoption of new materials and methods by builders is slow. Prehung doors were commonly accepted within two or three years of their availability but it took about 15 years for roof trusses to be accepted widely. Changes in the design and features of new homes during the 1980s are largely consumer-driven, based on value and life style considerations of the baby boom generation. ■

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Hazard Communications Rule Stalled

The Occupational Safety and Health Administration's (OSHA) ruling that building contractors must warn their employees about the hazards of chemicals with which they work and that formal training be provided for those who routinely use chemicals in their jobs has been challenged in the courts by the National Association of Home Builders (NAHB) and 17 other construction groups. The rule was supposed to go into effect on May 23rd, but the U.S. Court of Appeals of the District of Columbia has issued a stay on the implementation of OSHA's Hazard Communication Standard (HCS). According to Gary Komarow, NAHB's Director of Litigation, "OSHA had been working under the gun to write a standard, but they weren't given carte blanche to write any standard. Basically, we feel that the rule as it was written is not justified by the information that OSHA had in its files." Specifically, NAHB is working to get more reasonable rules for work sites where more than one contractor is working, and for exemptions for consumer products. OSHA representative Jennifer Silk states that the delay "could last three or four months."

Komarow warns that the standard will go into effect eventually, and that most contractors should use this time to prepare themselves for the standard. For that purpose the American Contractors Association Inc., the Associated Builders and Contractors Inc., and NAHB have jointly published a guide explaining what contractors will have to do to comply with the rule. *Hazard Communication: An Interim Guide for the Construction Industry* lists the most common construction site hazards, explains how to train employees, and provides a checklist to follow to ensure you are in full compliance with the standard. To order a copy, send $15 to NAHB, Business Management Department, 15th & M Streets, NW., Washington, D.C. 20005. ■

From What We Gather

Timber-framers love stressed-skin panels, but so do carpenter ants, according to a report in *Energy Design Update*. The solution, says one manufacturer, is to treat the foundation and perimeter soil, install a termite shield, and use details that keep the framing dry. Also, after the house is built, keep plantings away from the foundation and trim overhanging tree limbs.

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Cabinetmakers in Massachusetts breathed a sigh of relief in May, when the Mass. Dept. of Revenue ruled that they won't have to charge their customers sales tax on custom cabinets. The legal clarification came at the request of a group of cabinetmakers who had been audited and were being charged with back-tax bills ranging as high as $60,000. Source: *Woodshop News*.

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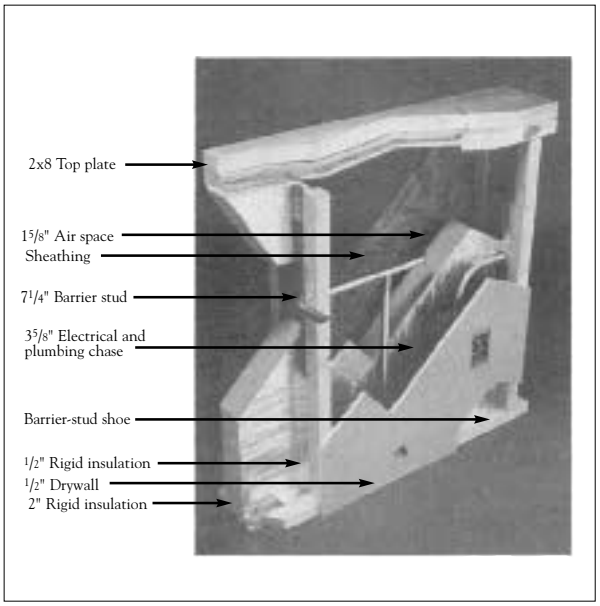
The world's largest CFC producer, Du Pont Chemical, announced that it will gradually phase out production of the types of chlorofluorocarbons that scientists credit with harming the earth's protective ozone layer. The company promises to aggressively pursue safe alternatives and to help customers adapt to the transition.

Beachfront Parking Condos — What Next?

A couple in South Kingstown, R. I. got the bright idea that they could turn their beachfront lot into easy cash by dividing it into 47 9x18-foot parking spots. They offered each "condominium" parking space for sale for $10,000 (the price is up to $14,000 now). The local government stepped in, however, and challenged the scheme on the grounds that this was, in fact, an unapproved subdivision, rather than a condominium conversion. Not so, said the R.I. Supreme Court, which recently gave the couple the go-ahead. The decision ended a 19-month long period of litigation. The Court held that the "conversion of the McConnell lot is a mere change in the form of its ownership and not a subdivision of land."

Town Solicitor Robert B. Gates expressed the town's displeasure at the ruling, and the town's fear that this could open the door to development that could avoid subdivision review. "What's to keep an owner of a 100-acre-tract of residentially zoned land from dividing it up into squares, and selling each piece as a 'unit'?" In the case, Gates argued that air space could not qualify as a condominium unit, and was therefore still subject to subdivision regulations. However, the Court disagreed with this view. ■

New Wall System Introduced at EEBA Show



The Barrier wall system relies heavily on the use of I-studs, studs which resemble the plywood I-beams often used for joists and rafters. The I-studs are used for top plates, shoes, headers, as well as for the vertical studs.

A contractor compresses a 2-inch-wide by 1/2-inch-thick strip of polyisocyanurate into the remaining interior web area to secure the bay insulation tightly in place.

One of the hottest items exhibited at the Energy Efficient Building Association's annual conference this past April was the Barrier System. The new wall structure was being shown for the first time by Lincoln Environmental Services, Inc., a company located in upstate N.Y. At the time, only one home had been built using the system, but the company hopes that once word gets out, its factory will be producing up to capacity — 5,000 houses per year.

At first glance, the system looks quite complicated (see photo of section), which may hinder the company's marketing efforts. But once understood, the concept is simple, and should make for simple installation. The key innovative feature in the Barrier system is its specially constructed studs that resemble the plywood I-beams now popular for joists and rafters. The 7 1/4-inch deep studs have waferboard webs and 1 5/8-inch square wood flanges, leaving a web area 4 inches deep. Once the wall is framed in the conventional manner, using the I-studs for top plates, shoes, and headers, as well as for the vertical studs, the wall is insulated with 2-inch-thick polyisocyanurate foam board pieces, precut to fit the wall's studs 24 inches on-center. The 2-inch web area left exposed to the interior is then insulated by compressing a pre-cut strip of the rigid foam, making for a snug fit (see photo). On the exterior wall side, the flange allows for a dead air space (1 5/8 inches), which provides additional sound and thermal insulation. On the interior wall side, the flange plus the web strip acts as a chase for electrical or plumbing work. Builders need not contend with penetrating the air/vapor barrier with utility lines.

The standard "Alaskan" Barrier system sells for $13.50 per linear foot (and provides an overall value of R-34, according to the company). A special "Arctic" version sells for $15.75 per foot and provides an estimated R-41.2. In a comparison provided by the manufacturer, using the "Alaskan" version almost doubles the cost of a conventional 2x6 wall system, with an R-value of 21.23. But the company claims that the cost is far outweighed by both the energy and labor savings, and the intangible benefits such as better soundproofing, more comfort, less customer callbacks, and easier mechanical installation. The company also reports that because barrier studs use waferboard webs, they save the equivalent of "approximately 100 studs" for every Barrier home built over a conventional home. ■

Boston Construction Labor Shortage Projected Despite Housing Slowdown

Although the housing boom in the greater Boston area is fizzling, Massachusetts officials expect a rapid increase in overall construction activity, and are bracing for a labor shortage.

The state has initiated an ambitious program called "Building Opportunities," to supply workers and to provide opportunities for the unemployed or underemployed. The program's budget for the coming fiscal year is $2 million, and allocations are expected to increase annually in anticipation of a construction labor shortage peak between 1992 and 1995.

The new opportunities are for large construction projects planned by both the public and private sectors — a new harbor tunnel, piers, and major buildings, according to Deputy Labor Secretary Happy Green.

"Nobody knows just how soon all of these projects will come on line," Green says. A task force appointed by Governor Michael Dukakis has estimated a need for 14,000 on-site construction workers and 3,000 off-site workers for design, technical services, management, and administrative support. Officials of the Boston Building Trades Council have challenged that estimate, saying the job demand may be half that figure or less.

According to Green, however, regardless of whose estimates are used, "With the volume of work that is expected, we don't have enough skilled people in the Boston area to fill the jobs."

Green acknowledged that residential construction has slowed down considerably in the Greater Boston area following a wild spiral in recent years.

According to the Greater Boston Real Estate Board, the inventory of unsold housing units was 5,690 in the first quarter of 1988, compared to only 1,422 units at the same time in 1985. And the annualized increase in median housing price was only 4.1 percent, following several years of double-digit rises.

The slowdown is attributed to many factors: reduced population growth, overreaction by developers to the high demand of recent years, and prices (the median is now $176,900) that have bumped potential homeowners out of the market.

But those who lose work from the slowdown in residential construction can't be counted on to fill the new jobs for major projects that are now scheduled, Green said. "There's a large difference between a finish carpenter and an iron worker, or someone who runs a backhoe, or a pile driver."

The Building Opportunities program is designed to match local people with the wide range of jobs that are expected to open up. That includes high-end positions for people like drafters, surveyors, and office workers who may need to obtain specialized skills for the specific projects.

But the largest component of the program, she said, will be preparation for the apprenticeship training programs that are offered by private industry. That includes identifying those who are in need, and, when appropriate, helping them to prepare to learn the necessary skills.

"We're not about to compete with the apprenticeship programs now in place," she said. "But not all of the people who need work are prepared for (those programs). A lot of people hear about the good-paying jobs in construction and want to share the bounty, but aren't ready to enter an apprenticeship program yet."

Green acknowledged that there is fluidity in the construction industry — workers move in to areas where work is needed. "But our role is to make sure that when good jobs open up, as many as possible go to local people who need them," she said. ■

If It Could Be This Easy

A giant contractor "peels" back the architect's blueprint to reveal the completed building underneath. Well, not really. The trompe l'oiel ("trick of the eye") was commissioned to act as a temporary construction wall, in place of the conventional construction barrier. Despite the mural's neat portrayal, real construction with all its attendant clutter, will be taking place behind it. The project, CityPlace II, is an 18-story mixed-use development located in central Hartford, and will take about 18 months to complete. It will be attached to CityPlace I, the original building, by a three-story glass-enclosed atrium. The mural was commissioned by Urban Investment & Development Co., co-developer of the project. ■

Tax Talk:

Home-Office Deductions

A large share of American business, including contracting, is done out of the home. If you are considering a home office, you should understand the tax breaks and pitfalls that go with it.

First, you have to determine whether or not your occupation is indeed a "trade or business" from the IRS's viewpoint. Investing only for your own account — for example, if you play the market — is not considered a trade or business. But your job as an employee is, in fact, your trade and business.

No deduction is allowed unless the office is used on a "regular and exclusive" basis. "Regular" means repeated, consistent, and not occasional. And, "exclusive" refers to a specific part or room of the home dedicated solely to your office.

If you have jumped the first set of hurdles — you use your home office on a regular and exclusive basis in the operation of your trade or business — your home office must fall into one of these three categories:

- It must be your principal place of business. If you are self-employed, no problem. If you are an employee, you must show that your employer provides no facilities or that they are unsuitable.
- It is a place where you meet and deal with your clients, patients, or customers in the normal course of business.
- It is a separate structure used in your trade or business.

Now that you have survived the minefield of qualifications and conditions, how much can you deduct? To make it simple, divide all possible deductions into four groups:

- Group 1. Expenses that relate to your business, not your home; such as postage, office supplies, wages, etc.
- Group 2. Expenses that are deductible in any case: mortgage interest and taxes.
- Group 3. Expenses that relate to the office itself: utilities, telephone, repairs, etc.
- Group 4. Depreciation on your home.

Remember, you can only deduct a proportionate part of the Group 2, 3, and 4 items. For example, if your office is 15 percent of the house, deduct 15 percent of these items. Of course, the remaining 85 percent of Group 2 items can be taken as itemized deductions.

Let's "crunch the numbers."

You must do it in this order: (1) Start with gross receipts from your business activity and (2) subtract the total of (a) all of Group 1 plus (b) the business percentage portion of Group 2. The "balance," if a profit, limits the amount of additional deductions you can take; if a loss, none of Group 3 or Group 4 can be deducted. Finally, subtract Group 3 and Group 4 amounts in that order. If a profit still remains, you have succeeded in deducting 100 percent of all four groups. Sorry, but as soon as the "balance" is reduced to zero, no further deductions are allowed. Put another way, losses caused by pure home office expenses (Group 3 and Group 4) are a no-no. ■

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Radon in the News

Weaver Works (Carmel, Ind.) has introduced a sump pump cover to keep radon and other ground contaminants from taking the easy way in.

In a survey of attendees at the National Association of Home Builders (NAHB) convention in Dallas this past January, three builders in ten report they are taking special steps to help keep radon levels low in new homes. Most builders in that survey stated that they use other professionals to do the testing and take the corrective action. Even so, with the threat of liability looming on the horizon, builders are hungry for knowledge about the colorless, odorless gas. Hence the newsletter *Radon News Digest*, a monthly which costs $115 a year and tells you as much as you want to know about radon, and more. Topics such as radon legislation, both federal and state, new mitigation techniques, and sources for even more information are covered. *The Digest* is also a forum for radon businesses to advertise. The newsletter is published by Hoosier Environmental Publishing, P.O. Box 709; Carmel, IN 46032; 317/846-1991.

While we're on the radon trail, we've heard of a new product that might help solve a radon problem with minimal expense and work. Weaver Works (511 Industrial Dr., Carmel, IN 46032; 317/846-7442) has announced production of a sump pump cover (see photo) that is easily installed, is made of ABS plastic, seals at the floor and seam, and has a clear viewing port. The cover sells to contractors for under $40, and is applicable for both retrofit and new construction. ■