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Underlayment: Do We Really Need It?

Moisture problems connected with felt underlayment have roofers and industry officials arguing over the quality of, and even the need for, underlayment on today's roofs. Most observers agree that underlayment provides a good secondary moisture barrier in case shingles are blown off or damaged. But complaints from builders and homeowners have led the National Association of Home Builders to question the need for underlayment at all, while the industry is debating the need for new standards regarding which types work best.

Wrinkles and waves. The biggest problem with organic roofing felt is its tendency to wrinkle after the shingles have been applied. The wrinkling is a result of excessive moisture gain, says Tom Smith, director of technology and research for the National Roofing Contractors Association (NRCA).

"Picture a giant sponge sitting on top of your roof. If water gets in it, it's going to swell up every place that it isn't nailed down," he says. This creates a series of small dips and waves over the surface of the roof. The waviness is especially apparent with lightweight, three-tab shingles.

Many roofing contractors have been forced to replace wavy roofs at their own expense, says Dick Morris, director of technology and codes for the National Association of Home Builders. Felt manufacturers often blame the builder's installation, damp plywood, moisture in the attic, and the quality of the shingles

for the problem.

Russ Snyder, assistant to the executive vice president of the Asphalt Roofing Manufacturers Association (ARMA), suggests some of the wrinkling can be avoided by using type 15 felt that meets American Society of Testing and Materials (ASTM) standards, specifically D4869 or D226.

"Some of the stuff that's being spec'd is no more than Kraft paper with black dye to make it look like roofing felt," he says. While the ASTM-certified material costs more, it's cheaper than replacing the roof. Snyder also says wrinkling is caused by builders who leave the underlayment exposed and unshingled for long periods of time, up to 60 days in some cases.

New guidelines may help. ARMA and NRCA are currently testing different underlayment types in various climates to determine what materials stand up best under certain conditions. Once testing is completed this summer, underlayment may come with specific recommendations about exposure times. In the meantime, Snyder recommends that underlayment be shingled within 72 hours, especially in wet, humid climates.

Interior moisture also a problem. While following this advice may be helpful, underlayment may still be susceptible to moisture from inside the house. "I don't think it matters if you use ASTM-spec'd material and shingle it over within hours of applying it," says Morris. "If the underlay-

continued

Mass. Contractors Can Reduce Comp Costs

The Massachusetts Construction Classification Premium Adjustment program, recently approved by the Massachusetts Workers Compensation Bureau, may give Massachusetts contractors some relief from recent increases in their workers compensation premiums. Under the ruling, contractors paying average

wages in excess of \$18 per hour in any one of 64 workers compensation classification categories can receive reductions, in the form of credits, in the premiums paid for workers in those categories. The reductions range from 5% for hourly wages of \$18 to 25% for hourly wages over \$28.

Insurers are required to send contractors a letter within 60 days of the effective date of the policy, notifying them of the availability of the credit. □



When roofers investigated woodpecker damage to the wood shingles on this California condo project, they found thousands of acorns stuffed under the sheathing.

Woodpeckers Go Nuts Over Townhouses

You thought you had problems. The owners of the Oakcreek East Condominiums in Napa County, Calif., recently had to

replace the wood shingle roofs on the development's 100 condos and 50 garages because woodpeckers were knocking

too many holes in them (see photo).

Apparently, the woodpeckers needed a place to store the many acorns they harvested from oak groves in the area. They would peck holes through the shingles and black paper, then hide the nuts in the insulation exposed between the 1x strapping beneath. In one unit with a cathedral ceiling, the hard-headed birds stuffed in so many nuts that they created a bulge in the ceiling wallboard below. In another, roofers investigating a leak opened the roof and found 5,000 acorns inside.

Discouraging the birds with tin tabs slid beneath their favored shingles didn't work; the birds just moved to the next unprotected shingle and pecked away there. The condo association finally had to contract to reroof all the units with fire-resistant, and bird-resistant, fiber-cement shakes. □

Car Phones Find Fast Lane

Seven out of ten cellular phone users believe their phones have helped them get ahead in business, according to a new Gallup survey done for Motorola. The respon-

dents said the phones helped them increase their productivity by 36%, primarily by letting them make use of what was, on the average, an hour of formerly unproductive travel time. Almost 5.3 million Americans are now using the phones. □

FHA, VA Clamp Down On FRT Builders

Builders who fail to repair roofs built with FRT plywood may be forbidden to work for future homebuyers using Federal Housing Authority (FHA) or Veterans Administration (VA) financing to purchase their homes. While the question of whether builders should pay for FRT repairs is controversial, homeowners have no other method of recourse, according to the FHA and the VA.

Both mortgage agencies are authorized to intervene when homeowners complain about structural defects within four years of purchasing a home. The FHA and the VA require the homeowner to try to make the builder repair the roof before they will get involved. If the home is insured under a commercial warranty program, homeowners are also asked to seek help from the warranty firm. If it refuses to help, the warranty firm can lose its certification. □

What Consumers Expect To Pay By Region

	Kitchen Remodeling	Bathroom Remodeling	Room Addition
New England	\$6,500	\$4,500	\$19,500
Mid-Atlantic	\$8,600	\$4,600	\$18,200
East North Central	\$6,300	\$3,400	\$15,200
West North Central	\$7,300	\$2,600	\$19,900
South Atlantic	\$7,500	\$4,100	\$22,800
East South Central	\$6,400	\$2,000	\$6,500
West	\$5,300	\$2,800	\$22,800
Mountain	\$6,200	\$2,800	\$20,800
Pacific	\$10,500	\$4,400	\$19,100

Consumers in the Pacific region expect to pay \$2,700 more than the national average to renovate a kitchen, while respondents in the Mountain region expect to pay \$1,600 less. Consumers in the East/South Central region estimate that a room addition will cost them \$6,500, or \$12,700 less than the national average. The same respondents expect a bathroom remodel to cost them \$1,800 less than the national average. □

Courtesy of Professional Builder and Remodeler

States Leading Way On Energy-Efficient Build-

With various national energy legislation proposals mired in endless debate, state and local governments, sometimes working with utilities, have been leading the way in developing energy efficiency programs for the housing industry. These programs generally take the form of Home Energy Rating Systems (HERS) that establish voluntary standards and incentives for energy-efficient construction.

HERS are not new. One of the first, the Good Cents program, began in 1983, and is used by dozens of utilities in many states throughout the U.S. What is new is the number of states that are implementing new programs.

Until recently, most of the programs were created by utilities, some of which did so only grudgingly, after threats of lawsuits from public interest groups. Now states themselves are creating statewide programs. At least 12 states so far have done so or are planning to.

HERS, which are usually voluntary, assign energy labels to houses based on the

efficiency of appliances, insulation levels, ventilation systems, types of windows and doors used, and so on. These are useful for home buyers who are comparing houses and, in some cases, seeking low-interest energy-efficient mortgages, which consider the lowered energy bills in setting borrowing limits. Participating builders benefit by receiving program certification and/or marketing and financial incentives.

The actual techniques and incentives of the programs vary widely. In Iowa, for instance, where a statewide energy rating system will go into effect next year, disclosure of a building's energy rating will be required at the time of sale.

In Vermont, Energy Rated Homes of Vermont uses appraisers and energy specialists to approve ratings and make recommendations for improvements. The state's program gives energy-efficient housing a boost by making borrowing for these homes easier — 43% of the homes rated by the program are qualified for energy-effi-

cient mortgages.

Another New England program, Energy Crafted Homes, qualifies participating builders by means of a weekend seminar reviewing the program's energy-performance standards; builders building homes to those standards get marketing assistance, and the homes are labeled as Energy-Crafted Homes.

New plans in the works. In California, builders, manufacturers, and politicians are working together to create the California Home Energy Rating System by June 1992. The group will develop a list of guidelines that builders can follow to build a tight house. New York, Colorado, Pennsylvania, and Arizona are also planning HERS.

Instead of developing their own programs, many states, including Virginia, Alaska, Rhode Island, and Texas, subscribe to the Uniform Energy Rating System (UERS), a HERS program developed by Energy Rated Homes of America, a nonprofit company based in Little Rock, Ark. Homes ranked according to the UERS system earn a certain number of points based on insulation, air leakage, furnace efficiency, use of solar

continued



Builders Balk at Billboard

Builders and politicians in Orlando, Fla., are at odds over billboards intended to draw attention to the city's growth. The signs supposedly depict construction workers as "cute and nearly cuddly," according to Orlando's mayor, Bill Frederick. But representatives of the Florida Construction Workforce Foundation, an industry group working to improve the image of the trades, say the unkempt and portly man portrayed in the caricature is insulting to builders and subcontractors. □

Despite Mixed Signals, NAHB Predicts Growth

This year's economic recovery may be relatively weak, but it's still strong enough to last through 1992. That's the word from David Seiders, chief economist of the National Association of Home Builders (NAHB), writing in the September issue of NAHB's *Housing Economics*.

Seiders noted that while key forecasting data remained

mixed throughout the summer, the overall trend in fundamental signals, as well as in federal monetary policy, suggested that the economy should, barring unforeseen economic disaster, continue its "sluggish but persistent recovery." The grain of salt, Seiders notes, is that "short-term forecast risks currently are very high. Builders should not climb out on long limbs." □

N.H. Court Nixes Snob Zoning

In a decision that may have national repercussions, New Hampshire's supreme court recently ruled that restrictive zoning laws in Chester, N.H., were illegal because they effectively denied people the right to affordable housing. The court gave permission to Raymond Remillard, a Chester native, to build low- and moderate-income multifamily housing on a 23-acre lot he owns in town. Remillard had been seeking permission to build the units there for some of his seven children and others of modest income since 1979.

He was prohibited from doing so by Chester's zoning restrictions. These restrictions allowed multifamily homes in only 1.73% of the town, and required that these units be part of a mix of single-family homes, duplexes, and multifamily structures — an expensive development proposition Remillard couldn't afford.

Remillard, joined in the suit by two other Chester natives who couldn't afford to build there, argued that these restrictions made it functionally impossible to build low-cost housing. The court agreed,

striking down that and other sections it considered discriminatory.

Affordable-housing advocates hailed the decision, which is expected to affect similar restrictive zoning in rural and suburban towns throughout the Northeast. Many of these towns have zoning laws that establish large minimal lot sizes and tightly restrict multifamily housing. This makes it difficult, given their high land prices, to build a home or even a duplex that is affordable to median-income or low-income people.

The court's ruling specifically addressed this problem, saying that "the town of Chester appears willing to lower the bridge only for people who can afford a single-family home on a two-acre lot or a duplex on a three-acre lot. Others are realistically prohibited from crossing." □

Singles Are Buying More Houses

The fastest-growing group of homebuyers is single people, a federal study has found. More than 1 million households are now headed by single people, triple the number 15 years ago. Many are buying — single adults, either with or without dependents, now make up 23% of homebuyers. □

From What We Gather

Building supply centers are performing an increasing share of remodeling jobs, including new kitchens, baths, patios, and other projects. These one-stop-shopping "installed service" programs sold almost \$70 billion worth of these jobs in 1991, double the 1981 volume. The centers generally farm the work out to the same contractors who might ordinarily bid the jobs. The reason most cited for the trend: customer anxiety about finding a trustworthy contractor.

The owners of a Frank Lloyd Wright home in Oak Park, Ill., received a permit to replace the house's art-glass windows and re-side it with vinyl siding. Meg and Peter Klinkow didn't actually make the changes; they obtained the permit (it took only 24 hours) to publicize what they considered weaknesses in the town's preservation ordinances. Oak Park has many historic homes, including 25 designed by Wright. The Klinkows, who live two blocks from a Wright house that has already been re-sided in vinyl, say the ordi-

nances need strengthening.

A subdivision built on a landfill is being endangered by methane gas seeping up through the ground and into homes. Town officials in Savannah, Ga., urged, but did not force, residents to abandon the homes. Few did, even though the odorless, explosive gas is visibly bubbling up through some of the yards, and is at spots dense enough to produce long flames over a match. "They're sitting on a bomb," said an attorney retained by some of the homeowners, who are suing the town for allowing the subdivision to be built.

No wonder you're confused about who the boss is. Husbands and wives themselves disagree sharply about who makes the decisions in their homes, according to a recent survey. Seventy-six percent of the men surveyed claimed they were the primary decision makers; but 44% of those men's wives disagreed. Twenty-one percent of women said they were the decision makers; but only 8%

of husbands said this was true. Fifteen percent of couples agreed that decisions were generally made jointly.

Maternity leave is offered by 79% of companies with fewer than 10 employees, according to a survey of small businesses in Minnesota, Oregon, Rhode Island, and Wisconsin. The leaves average nine weeks; 66% of them include continued health benefits. Companies with 10 to 20 employees offered even better benefits, with 89% offering leaves averaging 12.7 weeks, and 78% of these continuing health benefits.

The Justice Department consolidated 26,000 asbestos cases and shifted them to a single Federal District Court in Philadelphia. It is hoped that the move, which affects all asbestos-related lawsuits not already in trial, will speed consideration of the cases and, by moving the cases up the appeals ladder, reduce appeals. Many plaintiffs have spent years in various appeals courts — or even died — before receiving compensation. ■

State by State

California: A bill requiring energy retrofits up to minimum new-home requirements at the time of sale for existing houses has passed the senate and is awaiting action by the assembly. The bill covers all those houses built before the state's energy standards were established in the late 1970s. It requires either the buyer or seller to install attic insulation, weatherstripping, caulking, low-flow shower heads, a water heater blanket, and hot water pipe insulation.

Maryland: Requirements for low-flush toilets in all new construction and significantly remodeled buildings are expected to take effect here in February. Unlike similar legislation in other states, Maryland's law springs not so much from concern about water conservation, as from worries about the high cost of supplying clean water and

treating waste water.

Minnesota: A recently enacted statewide licensing law requires contractors to take a competency exam to receive a license, and to take continuing education courses to retain it. It also requires all builders, remodelers, and specialty contractors to carry workers compensation and liability insurance.

New York: A bill before the state assembly would exempt houses under 3,000 square feet from the requirement that an architect approve remodeling or building plans.

North Carolina: In May, this state became the first to outlaw "pay-if-paid" clauses in contractor-subcontractor agreements. These clauses allow contractors to withhold payment to subcontractors if the contractor is not yet paid by the owner for the sub's work. They are coming under fire in other states as well. ■

Reroofing Jefferson's University of Virginia

Aside from his political interests, Thomas Jefferson was fascinated by building construction and design. His use of innovative building materials is evident at his home, Monticello, and at the University of Virginia in Charlottesville, both of which he designed.

During a recent restoration of buildings at the university, architects discovered Welsh tinplate roofing shingles. Made from wrought iron coated with a thin layer of tin, tinplate was basically unheard of in the United States until the mid-1800s.

The unusual, 7x10-inch shingles were hidden beneath a layer of slate roofing on Pavilion X, one of a series of buildings designed by Jefferson between 1817 and 1826 as a combination residence and classroom. The shingles were applied horizontally, with workers using handmade iron nails to hold the tinplate to the heavy, wide-plank decking. The nails were protected from the elements by interlocking folds at the horizontal edges of the shingles. Further protection was afforded by staggering the joints.

While the system was simple to apply, requiring only basic carpentry skills, it was surprisingly tight, says Murray Howard, historic architect for the university. "Jefferson adapted the material to meet the

limited skills of the craftsmen at hand," he says. In the process, he developed a roof system that lasted at least 50 or 60 years until the slate was applied in the late 1800s. When they were uncovered, the tin shingles were rusty but intact.

Doing it the old way. The university decided to recreate, as closely as possible, Jefferson's original construction. The first step was to cover and protect the original membrane by adding a 3/4-inch plywood deck and a layer of single-ply neoprene for additional weatherproofing. Finally, imitating Jefferson's methods, university craftsmen nailed and lapped 4x10-inch tinplate shingles (stainless steel coated with tin and lead) that they cut from larger sheet metal.

No special pieces were needed for drip, ridge, or flashing details. The flexibility of the tin shingles meant they could be simply folded over the ridge and tucked up around chimneys. The original gutters, which were built into the roof, were made of wood lined with metal. They were also restored.

"Jefferson considered himself a conduit of good methods for building design. But he was not a master builder by any means," Howard says. "His goal was to help the builders raise the standards of their work." □

Foam Board Voids Termite Guarantees

In a blow to energy-efficient builders, Terminix, the insect-control giant, recently announced it will no longer guarantee termite treatments in homes that insulate foundation or crawlspace walls with foam board that touches soil. Energy-efficient building advocates say this may particularly affect builders in the South, where termites are a major problem, and where energy-efficient builders often use foam board to insulate the insides of crawlspace walls.

The problem, says Fred Cliff, Terminix's vice-president of marketing, is that "you're providing what is essentially a wood-to-ground connection that you cannot inspect. If the board reaches the ground, the termites tunnel through it to get to wood. And if the board covers the sill, no one knows you have termites until you have activity on the inside, and a huge damage claim. That, really, is the fly in the butter-milk. So our position is that we will treat these houses, but we will not guarantee them." Terminix usually offers customers guarantees with lifetime renewability (at about \$75 a year) and unlimited damage coverage.

Frank Vigil, of the North Carolina Alternative Energy Corporation, a nonprofit energy-efficient building organization, feels the concern is misplaced. He says that though he knows builders who have built hundreds of houses with foam perimeter insulation reaching grade, "I've never heard of any termite problems because of it."

Regardless, Terminix is refusing to guarantee such houses if the insulation reaches ground, and others may soon follow. Fred Cliff suggests that one solution, which might provide considerable insulation while minimizing the danger of infestation, would be to keep the insulation at least 4 inches above ground. In that case, says Cliff, Terminix would probably guarantee the house. □

Quick Energy Analysis

How much insulation should you use? ZIP, a computer program, quickly calculates insulation levels that balance initial investment against future energy savings. You supply information about the house and heating system, and ZIP specifies the zip-code-based optimal insulation levels. Available from MTS Software, 5 Oak Forest Court, Saint Charles, MO 63302; 314/441-1022. □

Tax Talk

Get Your Life Insurance Out of Your Corporation

by Irving L. Blackman

If, like many company owners, you have some of your life insurance owned by your corporation, you're risking a messy tax disaster down the road.

Let me explain. The most common reason for having your corporation own life insurance on you is to ensure that cash will be available to pay debts should you die, leaving your small corporation without leadership and earning potential. Not a bad reason. It's usually done early in the life of the company, when assets are low and real or anticipated debts are high.

But most owners retain this insurance even after the company is established and has assets and value of its own. The logic in keeping it is that the money will be there to pay debts if necessary, and if that's not necessary, the full amount can be passed on to a surviving spouse or children, tax-free.

But even though life insurance settlements are generally untaxed, it doesn't quite work that way when the settlement is passed on. Let's say you have a C corporation (a tax-paying corporation) that is doing well, capable of handling its debts, but that holds \$300,000 of insurance on your life. If you die, the corporation cannot pass that money to your family until it pays an Alternative Minimum Tax (ATM) of up to 20%, or \$60,000. If the company then passes the remaining \$240,000 on to your family, the IRS treats it as a taxable dividend, taking another \$67,000. The \$300,000 shrank to \$173,000.

If you have an S (tax-exempt) corporation, you fare a bit better: You don't pay the Alternative Minimum Tax,

and anything passed to the family isn't automatically taxed as a dividend. However, to the extent that your corporation had prior C corporation earnings (as many S corporations do), those previous earnings must be taxed as taxable dividends, and the tax paid, before the \$300,000 insurance proceeds can be distributed tax-free to your family. In other words, if your C corporation had \$300,000 in earnings before you converted it to an S corporation, the entire \$300,000 insurance settlement will be socked with the current income tax.

To prevent these ugly scenarios, if you don't absolutely need it to settle outstanding debts, you should get any life insurance owned by your C or S corporation out of the corporation's name and into your own. Simply buy it from the corporation for its cash surrender value and have ownership transferred into your name. Then your family will collect the entire settlement tax-free. The other advantage is that proceeds paid to a family member instead of the corporation are not subject to the claims of corporate creditors.

One more word: It's rare that I look over a client's life insurance program without finding a potentially expensive tax blunder — sometimes the income tax, sometimes the estate tax, often both. You should have a consultant who doesn't sell insurance review your insurance coverage periodically. ■

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HERS, continued

energy, and other factors. Heating and cooling loads are also projected, based on the house's score.

Whether these programs will help build momentum toward some sort of national standard is unknown; they may create more pressure, or they may actually relieve pressure for a national program. In either case, it seems certain that as more homes are built under these programs, they will have an increasing effect on the country's energy use. □

— J. Michael Boh

Underlayment, continued

ment gets wet, from moisture migrating through the attic for instance, it's going to swell."

The NAHB is pushing to get the underlayment requirement eliminated from codes. It argues that this would not only solve moisture-related problems with the material, but would also reduce roofing costs by between \$150 and \$200 per house. So far the association has been unsuccessful, principally because many roofing material manufacturers will not warrant a roof without underlayment. □

Used Redwood Finds New Home in Fencing

Offering an alternative to standard fencing material, a California company is manufacturing recycled redwood fence boards that are comparable in price to new lumber. New World Lumber, of San Jose, Calif., claims to be the first company to recycle used redwood in this form. Some landfills grind wood scraps into chips that serve as fuel for co-generation energy plants, but this only reaps about \$35 a ton. (See "Turning Trash Into Cash," JLC, 3/91.)

New World Lumber's recycled fence board is composed of two 1x8 boards (actually only 5/8-inch-thick after the old painted surface has been sanded or planed off) that are joined at the middle with a lap joint and staples. A 2x2 is dadoed to each edge of the board to provide further support.

The scrap redwood is gathered daily from the Guadalupe Rubbish Disposal Co., where New World Lumber is located. Other Bay Area landfills are also setting aside scrap redwood in anticipation of increased demand for this and similar products.

Kim Adams, director of

sales and marketing for the firm, says the company's success will hinge on three major factors: a continuing rise in redwood costs; fence builders' interest in using new material; and consumer desire to help the environment by using recycled wood. All this won't, she expects, happen overnight.

Adams says that while some lumberyards have been hesitant about the material, consumers have been responsive. "After presenting our product to lumber distributors at shows, I invariably have customers that will follow me back to the car and ask more about it."

One distributor, San Jose Lumber and Mill, has been selling the recycled 1x8 boards for about \$2.25 for a 5-foot board — about 50 cents more than for a similarly sized new redwood fence board. Charles Anderson, the yard's sales manager, says the product has been selling well.

Other recycled redwood products offered by New World Lumber include 6-foot lengths of the 1x8 fence board, and 1 1/4-inch lattice.

— Jim Hart

Engineered Wood Makers Merge

Two major producers of engineered wood products, TJ International's Trus Joist division and MacMillan Bloedel's Futurewood division, were expected to begin operating as partners this fall. Trus Joist manufactures open-web trusses, wooden I-joists, and Micro-Lam laminated veneer lumber (LVL). Futurewood produces Parallam parallel strand lumber (PSL) and PSL 300, a new structural composite lumber that's expected to serve as a low-cost substitute for dimension lumber.

The joint venture will benefit builders for several reasons, says Russ Stoddard, communi-

cations manager for TJ International. Distribution networks will probably expand, making both company's products more readily available. Also, the two companies' combined technology and capital means more effort will be put into developing new products. In addition, market analysts say the cost of Parallam, one of the higher-priced engineered lumber products, should drop as it becomes more widely available.

Both companies' products are notable for their efficient use of wood, says Paul Fisette, director of the building materials technology and management program at the University

of Massachusetts in Amherst.

"You don't find the good, clear lumber that used to be around, unless you cut down what's left of the old-growth forests," he says. "But these engineered products are so predictable in their strength and performance. I think we'll see the solid wood market gradually erode as more builders decide to work with engineered wood products."

One forest products consultant, George Carter and Associates in Oradell, N.J., predicts that as builders, building product retailers, and architects become more accustomed to engineered wood products, their use will increase by 160% by the year 2000. □

High-Efficiency Furnaces Required

Furnaces with an annual fuel utilization efficiency (AFUE) of less than 78% will soon become obsolete as federal regulations requiring higher standards take effect. As of January 1, 1992, The National Appliance Energy Conservation Act of 1987 requires that furnace manufacturers make only units that are at least 78% efficient.

"We don't see these standards as restrictive to builders at all," says John Morrill, business manager for the American Council

for an Energy Efficient Economy. "The idea is to just get rid of the energy hogs. No builder has any reason to put in a furnace with less than 78% AFUE anyway. The technology has been around for almost 10 years. It's simply a matter of putting together a quality home."

While some builders have used high-efficiency furnaces for years, in 1990, only 31% of all gas furnaces sold were high efficiency, according to the New England Fuel Institute. That means a lot of builders will be doing business differently after January 1, says Bernard Fuller,

executive vice-president of the institute.

Since high-efficiency units cost more, Fuller recommends builders budget an additional \$1,000 per house if they are subbing out the installation. It may also mean looking for an hvac sub who is accustomed to working with the new systems.

Fuller recommends stressing to homeowners the energy savings that high-efficiency units can bring. "People will spend thousands on new kitchen cabinets, but don't want to put out the extra money for a good furnace," he says. □