

NOTEBOOK

AUGUST 2000

EDITED BY MARTIN HOLLADAY & JON VARA

Suburban Scrapers and Teardowns Are a National Trend

With new houses getting bigger and land prices rising, older, smaller homes are biting the dust

They're called teardowns, scrapers, or scrape-offs. But by any name, the procedure is the same: A builder or homeowner buys an existing home — most often in a desirable suburban neighborhood where land is scarce — tears it down, and builds a larger, more modern home on the resulting lot. Hard numbers on the practice are difficult to come by, but Mark Calabria, an economist with the National Association of Realtors, estimates that about 5% of last year's 1.3 million housing starts could reasonably have been classified as scrapers.

Land recycling. Steve Hamilton is a Massachusetts builder
continued on next page



After climbing out of his Porsche and stripping off his suit jacket, a client takes the controls of an excavator and tears into an existing home, clearing the way for the new 8,000-square-foot home that will be built on the same lot.

High-Altitude Window Problems

A class-action settlement by Hurd Millwork has led to increased scrutiny of the way window manufacturers solve problems associated with shipping windows to high-altitude locations. The December 1998 settlement, under which Hurd agreed to pay \$5.3 million to plaintiffs contesting Hurd's R-value ratings for argon-filled windows shipped with breather tubes, throws light on the technical challenges of shipping windows to mountain locations.

As reported in the April 2000 issue of *Environmental Building News*, differences in air pressure between high-elevation home sites and window manufacturing plants can put great stresses on conventional insulated

glazing (IG) units. Most manufacturing plants are located at elevations between sea level and 1,000 feet. When shipped to high altitudes, sealed glazing units tend to "pillow out." Breakage of the glass or premature seal failure may then follow.

In 1988, Steve Andrews, a residential energy consultant, installed a large fixed window in his Denver home, where the altitude is above 5,000 feet. "When I put a straight-edge on the window glass diagonally, it rocks," says Andrews. To avoid such problems, some manufacturers install breather tubes in their IG units, in order to allow the pressure between the panes of glass to equalize as the air pressure changes.

The challenge with argon-filled units is to find a way to allow pressure equalization while preventing the argon from escaping. Because some argon can escape from breather tubes, most window manufacturers have elected to not make any special energy claims for the performance of argon-filled windows delivered to high-altitude sites — a direct response to the Hurd settlement.

How high is "high altitude"? If you're installing windows at mountain sites, you should ask your window supplier how they handle the pressure equalization problem. "Anywhere above 3,000 feet, you need to be aware of the problem,"

continued on page 3

Suburban Scrapers and Teardowns

continued from previous page

whose family-owned company has completed about 25 such projects in the past five years, most of them in the town of Lexington, a residential community within easy commuting range of Boston. "I like to call it 'land recycling,'" he says. "It's a way of freeing up old building lots for re-use."

Although demolition costs are substantial — Hamilton estimates that it costs a minimum of \$10,000 to \$20,000 to demolish a small one-story Cape — he notes that there are cost savings as well. "You've already got your zoning, your water, your sewer," he says. "You can get a building permit in less than a month. For a new lot, if you can find one, that might take a year."

In any case, rising land prices have made demolition costs almost irrelevant. Four or five years ago, Hamilton observes, some of his finished homes were selling for \$350,000. Today, area builders eagerly pay that figure for older homes to tear down, while their replacements routinely go for \$1 million or more.

Mansionization. In the red-hot housing market of California's Silicon Valley, that same million would barely suffice to buy a house for demolition. In the area's more popular and upscale residential communities, notes Oakland-based builder Mike Muscardini, there's simply no other way to obtain land. "You're usually looking at one-acre lots that already have big custom homes," he says. Muscardini has had no problems obtaining needed demolition permits, and some of his clients actually enjoy the demolition process. "In a couple of cases, we've put the client in the seat of the excavator, given him a quick course in operating it,

and let him do the first 15 minutes of demolition," he says. "We could hardly get one guy to stop."

But in neighborhoods of smaller, more closely spaced housing, teardown projects are sometimes controversial. Critics claim that introducing large new houses to an established neighborhood damages the character that made the area desirable to begin with — a phenomenon sometimes called "mansionization."


Steve Hamilton's houses are built on spec, but each is architecturally designed to be a good fit with its neighbors. Not all builders in the area give much thought to design, he concedes. "The worst is when a builder takes a huge plan-book house and

small lots. Floor-area ratios, she notes, are no guarantee of architectural harmony. "We provide builders with design guidelines," she says, "but we're considering going to an architectural review board for residential construction as well as commercial."

In the upscale Chicago suburb of Lake Forest, an existing house can't be torn down within two years of purchase by a new owner, unless a replacement design has been approved by the local review board. Area architect David Poulton also believes that design, not size, is the real issue. "As long as a house is well designed and uses appropriate details," he says, "it can be bigger than its neighbors and still fit in."

He describes a controversy that developed around one recent project, which involved demolishing an undistinguished bungalow. Neighbors argued that the bungalow was a historic structure — a claim that Poulton calls "far-fetched" — and tried to prevent its demolition. Ultimately, the local

architectural review board approved the project, which later won a historical design award.

Complaining all the way to the bank. But despite occasional grumbling, local resistance to teardown projects has not been a serious problem in most areas, at least so far. The reasons, according to Wellesley, Mass., planning director Richard Brown, are not hard to understand. "It's disruptive for the folks in a neighborhood to see that happen," he concedes, "but it tends to raise property values in the area." In Wellesley, Brown observes, a house that goes on the market for \$650,000 may be bid up to \$850,000 to \$900,000 as a teardown. "People don't complain that much," he says. "They know they're going to sell their own houses someday." 

Teardowns are disruptive in a neighborhood but tend to raise property values

plunks it down with no regard for what's already there," Hamilton says. He describes one area neighborhood as "Cape, Cape, Cape, mansion, Cape, Cape, mansion."

Targeting monsters. Driven by those sorts of concerns, local governments nationwide are considering — or have already adopted — regulations aimed at so-called "monster houses." One common planning tool is the floor area ratio, or FAR, which limits the size of new homes to a specified percentage of the lot size.

The Silicon Valley community of Palo Alto, Calif., has had FAR regulations in effect since 1988. According to city planning official Lisa Grote, her department now receives eight or ten demolition permit requests monthly, typically for modest older homes on



Bringing Women into the Trades

The building industry continues to struggle with the worst labor shortage in a generation — a shortage that could be eased considerably if more women were to seek work in the trades. One group has been working for years to accomplish just that — Vermont-based Northern New England Tradeswomen (NNETW), which sponsors training and education for women seeking work in the trades and technical fields.

NNETW's flagship program, Step-Up for Women, has brought nearly 700 women into the work force as heavy-equipment operators, carpenters, and other skilled workers. The organization's 14th annual conference, held this spring in Montpelier, Vt., was attended by women from across the country, and featured several workshops devoted to the building trades. Among the most popular was a session at a local job site, where participants had the chance to operate a bulldozer, a skid-steer loader, and a roller.

But, according to NNETW executive director Tiffany Bluemle, more effort is needed. "We need to start sooner," she says. "Young girls need to know about the full range of career options open to them."

This summer, the organization will launch Rosie's Girls, a first-in-the-nation program to expose younger girls to the possibilities of skilled work in the trades. In addition to traditional summer-camp activities, the 6th- and 7th-grade participants will learn the rudiments of carpentry and other trades from women who are actively working in the field. Participants will have a chance to put their new skills to work in the real world by taking part in community service projects.

To learn more about NNETW, contact them at 189 North Main St. #9, Barre VT 05641; 802/476-4040.

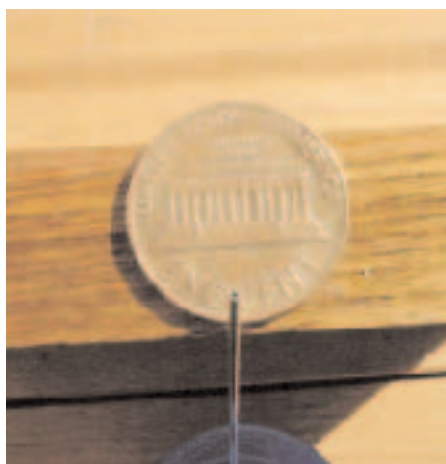
High-Altitude Window Problems

continued from page 1

says Randi Ernst, president of FDR Design, a Buffalo, Minn., manufacturer of equipment for filling IG units with gas.

One solution is to seek out a local manufacturer that assembles its windows and IG units at a high altitude. But because some smaller window manufacturers appear to be unaware of the problem, the burden is on the builder to be alert and wary. "The window industry is known for mom-and-pop type shops," says Ernst. "We are reaching the point where the customer or builder is more knowledgeable than the fabricator."

Most large manufacturers take one of two approaches. If the edge seal is deemed strong enough and the glass flexible enough to resist pressure changes, the IG units are shipped sealed. But if the windows have a



long narrow shape, making them vulnerable, or if they are traveling to a very high altitude, they are shipped with breather tubes. These breather tubes may need to be crimped after delivery. Smaller diameter breather tubes, called capillary tubes, are often left open, with the hope that any moisture entering the space between the panes will be absorbed by the chemical desiccant in the frame. This

When windows need to be shipped to high-altitude locations, manufacturers often install breather tubes in the insulated glazing units, so that differences in air pressure do not stress the glass. The smallest diameter breather tubes, like the tiny stainless-steel tube shown at the bottom of the penny in this photo, are called capillary tubes.

may be risky, however, since a window can fog if the desiccant is overwhelmed by introduced moisture.

Nehemiah Stone, an energy consultant and window expert from Fair Oaks, Calif., advises high-altitude builders to avoid large panes of glass. "If you want large pieces of glass, mull small windows together," he says. "If you have a big window, seal failures are just a matter of time."

Making Lumber from Curved Logs

Did you ever pull a squirrely 2x10 out of the lumber pile and mutter, "Can't they saw straight at the mill anymore?" As it turns out, many sawmills are deliberately sawing on a curve, although that's probably not why your 2x10s are crooked.

In the past decade, North American sawmills have increasingly adopted a new sawing technology called



Curve sawing equipment, which is computer-controlled, allows the sawmill to follow the curve on an S-shaped log.



"curve sawing." Curve sawing equipment, which is now commonly used to produce softwood dimension lumber, permits logs with a sweep to be sawn along the curve. One equipment company, Sawquip International of Lavaltrie, Que., advertises, "The chipping heads and saws follow the log contour, making it possible to process S-shaped logs."

Several manufacturers make curve sawing equipment, which depends on laser scanning devices to measure a log in three dimensions as it approaches the saw. A computer quickly calculates the optimal cutting

path of the saw. If the log has a sweep to it, the computer directs the saw to follow a curved path.

Hard-to-handle lumber. The boards that come off the saw don't look like much. "You end up with a board that looks like an S," says Toby Slagle, sales and marketing manager at U.S. Natural Resources, a sawmill equipment manufacturer in Woodland, Wash. The curved lumber can cause problems with equipment at the mill. "There's an unscrambler, which feeds grouped boards individually into the next machine," says Derek Goudie, process optimization scientist at Forintek, a forest industry research corporation. "Sometimes a curved board doesn't properly fit into the machine, or falls off the unscrambler." To minimize handling problems with the curved boards, mill operators have learned to limit the radius of the curved cuts to a sweep of about 5 inches in 16 feet.

Eventually the lumber is stacked and kiln-dried. "It's not going to be a nice, even, flat load, as it would be with flat boards," says Goudie. "There will be some misshapen piles." By the time the lumber comes out of the kiln, though, the curves have settled down. "They pretty well straighten out by themselves," says Sigi Rothbart, marketing coordinator at CAE Newnes Ltd. in Salmon Arm, B.C. "They have a tendency to flatten out," he adds. Equipment manufacturers claim that curve sawing equipment actually results in higher quality lumber, since their saws are more likely to follow the grain than straight saws.

Pat Cramond, an instructor at the Dept. of Wood Science at the University of British Columbia, promotes the advantages of curve sawing. "If you have a 6-inch log, 10 feet long, with a 2-inch curve, you might get two 2x4s out of it with curve sawing equipment," says Cramond. "With regular straight sawing, you wouldn't even get one 2x4. Those logs would not have been brought to the mill. They would have been thrown away."

For the sawmills, the main advantage of the equipment is increasing the board footage that can be squeezed out of each log. "To a limited extent, you might be able to utilize logs which you might otherwise chip," says Goudie. "But the main advantage of the equipment is that it allows a higher yield."

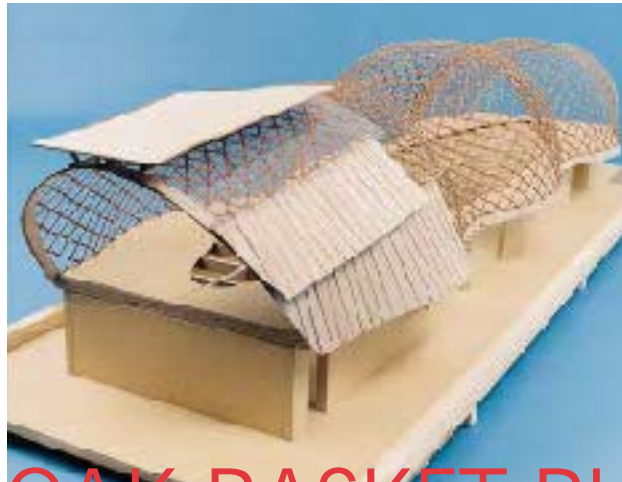
OFFCUTS

Some don't like it hot. Researchers at New Mexico's Institute of Mining and Technology have developed a process that chemically bonds the natural "heat" of chili peppers to paints, stains, plastics, adhesives, and other rubberized materials. Tests have shown it to be an effective termite repellent, and its developers hope that the treatment will also repel other insects, wood-boring birds, and terrestrial and aquatic animals.

Borderline issue. If you've ever thought about avoiding a sales tax on building materials by purchasing from a supplier in a neighboring state with a lower tax rate, you might want to think again. This spring, an Andover, Vt., woman was fined \$2,200 and sentenced to 180 days probation for failing to pay Vermont's 5% sales tax on \$25,000 worth of building materials purchased in tax-free New Hampshire.

Cellulose insulation increases the fire resistance of stud walls, according to independent lab tests sponsored by the Cellulose Insulation Manufacturers Association using ASTM E 199 protocols. The fire resistance of wood stud and gypsum board wall assemblies was found to be at least 26% greater than that of uninsulated wall sections, suggesting that cellulose insulation used as sound insulation in partition walls may also inhibit the spread of flames.

Home Energy Ratings Systems (HERS) are spreading, according to a report by the National Renewable Energy Laboratory. The number of states with HERS programs has risen from only 16 in 1993 to 47 states today.



Very long oak laths will form the entire structure — walls and roof — of a "timber gridshell" building in England. As shown in this model, the lattice frame will be shingled with 1x6x10 red cedar boards.

OAK BASKET BUILDING

A timber-framing contractor, The Green Oak Carpentry Co., has been chosen to build an unusual "timber gridshell" building in England. The building will have no studs, rafters, posts, or beams. Instead, the building will have a basket-like structure built of long, thin laths of unseasoned oak. The laths, which measure 1³/₈ inch by 2 inches, will be finger-jointed end-to-end to make 118-foot boards. Once the laths are formed into a dome-shaped grid, they will form the entire structure of the building's walls and roof.

Although several gridshell buildings have been built in Germany, this will be the first one in Britain. The 164-foot-long building will be erected at the Weald and Downland Open Air Museum in Chichester, and will serve as a timber-framing workshop. Because the design of the building was so challenging, the architect, Steve Johnson of Edward Cullinan Architects in London, decided to invite the carpentry company to join the design team.

Originally, the designers had assumed that the oak laths would be kiln-dried, and the intersection points would be bolted together. However, the carpenters noted a few problems: Kiln-dried oak is not particularly flexible, and the bolt holes would weaken the joints and threaten to split the laths. They suggested that it would be easier to build the shell out of unseasoned oak. "Oak is more supple when it is new-sawn," says Andrew Holloway, one of the builders from Green Oak Carpentry. The carpenters also helped design custom hardware to fasten the laths together. Each of the 2,000 lath intersections will be clamped together between a sandwich of square steel plates that are bolted together at the corners. The laths will not need to be drilled. This "mobile connection" will allow the gridshell to deform as it is assembled. Once the shell has achieved its final shape, the connector bolts will be tightened.

To take advantage of the flexibility of green lumber, a tight schedule has been developed, starting with the felling of the oak trees in northern France. The oak boards will then be shipped to a mill in England for finger-jointing and planing, and quickly delivered to the job site. If all goes according to plan, the gridshell will be assembled in late summer. "We'll use ratchet straps to tension it up," says Holloway. "The crowns will then rise." Holloway is well aware of the many uncertainties ahead. "I have a sense of nervous anticipation. There are some unknowns. We cannot fully predict the behavior of the gridshell."

Rocking the House in San Diego

This spring, a team of researchers at the University of California at San Diego performed the world's first simulated earthquake test on a full-sized house. The test served as the opening act for a long-term study aimed at understanding how wood-frame buildings withstand — or fail to withstand — such forces. Although individual building components such as shear walls and connectors have been studied extensively, the Woodframe Project is the first to examine in detail how buildings themselves behave in an actual quake.

The test was conducted on a 4.8-ton, computer-controlled “shaker table,” which accurately reproduced the ground motion of the Northridge quake that struck Los Angeles in 1994. The Northridge quake caused \$40 billion in property losses and killed 25 people.



Researchers at a San Diego earthquake simulation lab prepare to shake up a full-sized test house, as the first in a series of tests aimed at evaluating the strength and stability of a variety of wood-framed homes.

As expected, the two-story, 600-square-foot test structure withstood the 25-second shake-up without dramatic failure, although there was some splitting of the plates and minor buckling of the OSB sheathing at the corners of openings. (As a concession to reporters on the scene, the researchers had mounted two large pottery planters below the second-story windows, one of which came loose and fell to the platform with a satisfying crash.)

Project engineers are still evaluating the test data collected by 300 sensors mounted on various parts of the building. But according to principal investigator André Filiatrault, of the UC San Diego engineering department, the initial results raise some interesting questions about foundation anchor bolts.

In an unengineered structure, Filiatrault explains, the exact locations of the anchor bolts may have an important effect on resistance to earthquake damage. “If the bolts are too close to an opening — say less than a foot or so — it favors uplift of the studs at the opening.” Moving the bolts back from the opening, he observes, seems to allow the section of plate adjacent to the opening to lift slightly, absorbing some of the energy and reducing the damage caused by stud uplift. “Obviously, there’s a balance somewhere,” he says. “If the bolts are too far from the opening, the plate can lift too much, increasing damage at the opening.”

OFFCUTS

Architecture students from Auburn University are building homes for low-income residents of rural Alabama, according to a recent story in the *Mobile Register*. The new homes make use of a number of unconventional materials, including old tires, rammed earth, and hay bales, and have performed well, despite the initial reservations of some program participants. “Ain’t nobody ever showed me no hay house,” one homeowner was quoted as saying.

Spacious, well-appointed laundry rooms are emerging as a new home status symbol, the *Washington Post* reports. The report described the 20x25-foot laundry room in one huge new home, which contains an assortment of closets and cabinets, rolling storage, an expansive work table, and a raised tile bathtub with steps, which serves as a grooming area for the family's golden retriever.

Armstrong World Industries has launched a new ceiling recycling program, which offers builders who renovate commercial buildings a cost-effective alternative to landfill disposal. If the removed tiles are judged to be suitable for recycling, Armstrong will pay the freight costs to its nearest manufacturing plant. The only catch: To qualify for free freight, you need to have enough material to fill a tractor-trailer rig, or about 30,000 square feet of ceiling tile. For more information, call Armstrong at 888/234-5464, or visit its web site at www.ceiling.com.

The Decline of the Common Nail

Many framers remember the quiet time before air compressors, when each work day was punctuated with regular breaks to fill the nail apron from a 50-pound box of 16d common nails. But since nail guns have taken over framing, the days of the common nail — an essential component on job sites for over a century — appear to be numbered.

"Collated nails probably account for 40 to 45 percent of the market," says Hollis Henderson, district sales manager at Insteel Industries, a nail manufacturer in Mount Airy,



Bulk common nails, which for decades have been essential for framing houses, are now purchased mostly by homeowners, not builders.

N.C. "Sales of collated nails are growing tremendously every year." Simultaneously, fewer bulk common nails have been sold. "The market for bulk nails has shrunk by a good 30 or 40 percent," said a sales manager for a large nail manufacturer, who preferred not to be identified. He attributed the decline to the increased use of collated nails.

Paul Hylbert, president of Prime Source Building Products of Carrollton, Texas, a nail manufacturer and distributor, is acutely aware of the declining market for common nails. "The changes in the nail business really have been dramatic," Hylbert says. "We've had to adapt." As builders have made the switch to collated nails, distributors note that most common nails are now sold in small packages.

"Over the past five years, our sales of collated nails have grown at a rate of 30 percent a year," says Hylbert. "With regular hand-driven nails, we've gone from selling pallets of 50-pound boxes to selling pallets of 1- and 5-pound packages, for the convenience of the homeowner."

The Real Prefab Housing Forecast

What's the outlook for prefabricated housing as we move into the 21st century? That seems to depend on your point of view. According to *Building Systems Magazine*, the outlook is bright. Under the heading "Forecast: strong growth," the magazine stated that "... building systems technologies are predicted to capture a greater share of all nationwide construction in the new millennium, thanks to a growing number of lenders, developers, builders and buyers recognizing its inherent advantages over traditional site building." To support that claim, the article referenced a 177-page study, "Prefabricated Housing," recently issued by the Cleveland-based Freedonia Group.



The picture presented by the study itself, however, could be more accurately described as "mixed." The executive summary of the Freedonia Group report notes that while prefabricated housing (including manufactured, panelized, modular, and precut houses) is expected to increase its market share to over one-third of all housing starts by 2003, its growth rate will actually be "markedly slower" than during the period from 1993 to 1998.

The report also predicts that panelized housing will make up the fastest-growing segment of the prefab market, with sales increasing by 2% annually through 2003. Multi-section units are also expected to do fairly well, although manufactured housing — which accounted for more than half of all shipments in 1998 — is expected to decline slightly. Overall, the report predicts, demand for prefab housing will be strongest in the South. Demand is expected to be flat in the West, with declining demand in the Midwest and the Northeast.