

Trusses: A Burning Issue

"Small pieces of wood burn faster than big pieces of wood." To fire service veteran and anti-truss crusader Francis Brannigan, the problem with truss framing systems is as simple as that. Brannigan, a former firefighter and author of *Building Construction for the Fire Service*, has spent much of the last 20 years leading a campaign against roof and floor truss systems. Brannigan and many others in the fire service blame trusses, which they say collapse earlier in fires than do conventional joisted or raftered framing systems, for the deaths of several firefighters in recent years, including five who died in 1988 when a truss roof collapsed beneath them in Orange County, Fla.

Opposing Brannigan in this debate - which sometimes burns as hot as the trusses themselves - are truss and wood products industry people who cite standardized tests that they say show little significant difference between the two systems.

According to Brannigan, both experimental and anecdotal evidence show that trussed framing systems collapse as many as 5 to 10 minutes sooner than conventional joist or rafter systems when exposed to fire. As a result, firefighters doing the things they normally do in the middle stages of a fire - such as "venting" the roof by cutting a hole in it or searching a house for occupants - are placed in severe danger.

The problem is with the very materials that make truss construction attractive to builders. The small dimensions of the lumber give it a high surface-to-mass ratio, making for a faster burn. Also, the spare, lightweight



Joist floor and roof systems have a low surface-to-mass ratio and will stand up longer in a fire. Truss systems may collapse more quickly, making it unsafe for firefighters to vent roofs (above) or search the house for occupants.

design, in which every component of the truss plays an important role, means that the failure of any one part endangers the whole system. "In a joist system," says Brannigan, "you have some fat to burn away. With the truss system, there's no fat."

Brannigan backs his assertions by pointing out a number of fires in which truss systems collapsed, as well as a set of tests done by Los Angeles Fire Department

Battalion Chief John Mittendorf in 1982. Mittendorf ignited barrels of thinner-soaked pallet wood beneath unprotected 30-foot-wide truss roof systems (no ceilings beneath). The trusses failed in less than five minutes.

Unfortunately, Mittendorf's tests did not include joisted systems for comparison. In fact, while many protected truss systems have been tested for one-hour fire ratings, no definitive

head-to-head test of unprotected truss and joisted systems has been done. This leaves the issue open to endless debate as truss advocates and critics cite different studies, analyses, and anecdotes to support their arguments.

Erwin Schaffer of the U.S. Forest Products Laboratory, in Madison, Wis., for instance, wrote in the March/April 1988 *Fire Journal* that according to both burn tests of 2x4 lumber and analysis of char rate and load-carrying data for 2x4s under tension, unprotected, fully loaded wood-truss assemblies should withstand fire exposure for 9.5 to 11.7 minutes before collapsing. He compares this to standardized ASTM-E119 tests (the test used to establish fire ratings) that show unprotected joist and raftered systems fail in 10 to 13 minutes.

Wood and truss industry representatives say such evidence shows there are no significant differences in the stability or longevity of trussed and conventional systems during fire. Brannigan, however, finds a number of faults with the ASTM test, saying that the test's conditions are so tightly controlled that they bear no relevance to a real fire.

According to a wood products industry spokesperson who asked not to be identified, Brannigan was invited to participate in an ASTM forum on revising the E119 test and declined. The same source called the two-minute difference insignificant when one considers the many minutes of protection (up to 60 or more) offered by proper firestopping and the use of fire-rated gypsum for one-hour-rated

ceilings.

"The protection is the critical aspect," he said. "These emotional appeals only distract from the more important issue, which is how the protection is applied. To say that joists last longer than trusses is highly speculative. I'd like to see more attention given to building the assemblies properly."

At this point, the debate has taken on a life of its own, though to what purpose isn't clear. Not even Brannigan sees any realistic chance of outlawing trusses or getting significant code changes made with the present evidence. U.S. Forest Products Laboratory researcher Robert White is presently conducting a new series of tests comparing burn rates of trusses and conventional systems, but he doesn't expect results until 1991.

In the meantime, trusses will probably remain, in the words of Vermont fire inspector Bruce Martin, "the hottest issue between firefighters and builders."

Some fire districts are already fighting fires in trussed buildings less aggressively than fires in other buildings. In Los Angeles, for instance, John Mittendorf says that if a crew suspects a building is of lightweight truss construction, they will surrender parts of the building they might fight to save in a conventionally framed building.

Brannigan says that in view of the unlikelihood of other changes, this is the fire service's only choice. "If it's a disposable building, you let it go. We don't have any disposable firefighters."

- David Dobbs

Japanese Prefer Old-Growth Timber

In 1989, Oregonians voted to ban export of old-growth logs from state-owned forests. The ballot measure, which is illegal by U.S. law because it restricts exports, also called on Congress to permanently ban the export of logs grown on federal lands.

A recent International Trade Administration report sheds light on the controversy by explaining why the Japanese are buying U.S. forest products. Here are some of its conclusions.

New markets for wood. The U.S. government trade policy promotes exports to Japan because they increase revenue from federal lands. This helps the balance of trade. Currently, the yen-to-dollar exchange rate favors the Japanese currency, and the Japanese have been importing a large percentage of their timber.

Over 69% of the Japanese

wood supply comes from imports - up from 59% in 1972. The volume of imports has been increasing too, as changes in the Japanese building codes open new markets for wood construction.

Changes in fire codes, which had restricted wood-construction to outlying areas, now allow wood structures under three stories close to major cities. Now, single-family homes that use Japan's centuries-old craftsmanship and joinery can be erected within commuting distance of downtown.

Japanese builders. Traditional Japanese building honors the role of the "master builder" - someone so steeped in the tradition of their craft that a few are even designated "national treasures." Traditional Japanese builders, who supply a significant portion of the country's single-

family housing, use post-and-beam construction and large timber. (Horizontal beams, for example, are usually a heft 4 1/8 x 12 inches by 13 feet). The builders' preference for even-grained softwoods and the burgeoning market for wood construction is increasing the demand for old-growth timber. Some timber comes from Japanese forest, but it's actually less expensive for the Japanese to import timber from North America, in part, because of the exchange rate.

Japanese lumber dimensions are much different from ours, and are not even standard within the country. Because none of the traditional Japanese dimensions match those of U.S. mills, the Japanese must import raw timber, or be convinced that 2x4 construction is the way to go. But until then the Japanese will buy undressed U.S. lumber and continue to displace American sawmill jobs.

Under pressure from the U.S., the Japanese government is providing special training programs

for carpenters and contractors and touting the benefits of American-style wood frame construction, but code hurdles, like those in the U.S., block widespread adoption of new construction methods.

In an interesting twist to the Japanese building codes situation, traditional post-and-beam dressed timber, erected by a Japanese master builder, doesn't have to be graded. The master builder has the final say. But with 2x4 construction, lumber and panel materials must meet exacting Japanese grading standards.

Even if Japanese contractors can be convinced to build with 2x4s and 4x8 panels (the normal Japanese panel size is 3x6), they could not find mortgages for their houses until recently. The government's Housing Loan Corporation (HLC), the biggest financier of mortgages, won't finance 2x4 construction.

However, the HLC is considering revamping its loan requirements if ongoing pilot projects are successful.

Pilot projects. To test the merits of 2x4 construction, the HLC is building the "Seattle Village" demonstration project in Kobe. If all goes well during the construction of 13 two-story homes, the HLC may relax its regulations on wood-frame construction. They're also putting together a "how-to" guide for Japanese builders that will allow contractors using the method to qualify for HLC financing.

The American Plywood Association (APA) and Western Wood Products Association have been busy promoting American-style construction. In Tokyo's Summit House, they've created a 5,400-square-foot visitor attraction built in a mere three months (instead of the six it would have taken a Japanese builder).

While the North American trade associations would like to see more exports of dimension lumber to Japan, builders are notoriously stubborn in their ways. Building tradition can be harder to change than codes or lumber dimensions. ■

Easy Energy Info.

Do you have questions about simple construction practices that can improve energy conservation? Or are you looking for a source on wood — or solar-energy products? There's easy access to free information on these and many other energy-related topics. The Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS) offers fact sheets, brochures, bibliographies, and innumerable contacts. Contact CAREIRS at Renewable Energy Information, Box 8900, Silver Spring, MD 20907; 800/523-2929.

No More Building in ADK Park?

Fearful that the massive 6-million-acre Adirondack Park will be overrun by development and speculation, officials of New York State's largest park have proposed a two-year ban on most construction.

Park officials fear that builders sense an onslaught of building regulation and are trying to beat the controls by building now. If adopted, the moratorium would apply to shorelines outside villages, roads in unpopulated areas, 40 scenic vistas, and remote wilderness areas. Observers give the proposed ban little chance of getting through New York's Legislature.

New Federal Disabilities Standards Coming

At press time, The Americans with Disabilities Act was before the House of Representatives. If it passes, it will mean important changes in the design and construction of commercial buildings and apartment houses. Already approved by the Senate, it is intended to prevent discrimination against disabled persons by making all buildings and public transportation accessible.

While home construction will not be affected, the implications for light and heavy commercial

construction could be extensive. This is particularly true in states where accessibility codes have in the past been optional or poorly enforced, says Peter Robertson, president of Access Unlimited, a California-based consulting firm for architects and builders.

The act, introduced by Senator Tom Harkin (D-Iowa), requires states to incorporate code standards equal to or more stringent than those set forth in the Uniform Federal Accessibility Standards (UFAS) and the



If The Americans with Disabilities Act passes, it will mandate changes in the design and construction of commercial buildings and apartments. Installation of access ramps may be required by Federal law.

American National Standards Institute (ANSI). More specifically, the act requires that elevators be installed in buildings taller than two floors with a minimum of 3,000 square feet per floor and that all paths of travel be fully accessible.

The codes will apply to all new construction of commercial buildings as well as "major" renovation projects.

Since one of the goals of the act is to make buildings accessible for disabled employees, all areas of use must meet codes. "If you're qualified for a job but can't get into the office, you're stuck," says a staff member of Senator Harkin's office.

But the American Institute of Architects (AIA), one of several groups objecting to some provisions of the legislation, says the bill is too general when it comes to defining work spaces. "We don't know if it includes things like catwalks, projector booths, or utility rooms, for instance," says Albert Einsberg, chief lobbyist for the AIA.

Calling the legislation's reference to retrofit projects "nebulous," Einsberg says the bill should define what will be considered major renovations. "Otherwise small alterations will become large ones to make the space accessible and useable." He is also concerned that the characters of historic properties could be altered significantly in order to make them accessible.

Some opponents of The Americans with Disabilities Act say they are concerned that installing ramps, lever door handles, appropriate lavatory fixtures, drinking fountains, and

telephone booths will add up to increased project costs, Robertson says. Yet according to his estimates, making a new building accessible will add only one-half of 1% to construction costs.

June Isaacson Kailes, a California-based public policy consultant specializing in disability-related issues, says most buildings are "designed for a healthy, physical fit 21-year old male who can negotiate steep inclines and steps with ease." In the next 25 to 30 years, when the baby boomers hit their 70s and 80s, a larger proportion of the population will be disabled. Current figures show 17% of the population, or one in ten persons, have physical, visual, or hearing disabilities, she says.

California, Oregon, Idaho, Utah, and Washington already have accessibility codes in place. All five states base their standards on those set forth in ANSI and UFAS. But California code, which was updated last year, could serve as an example to many states, Robertson says. Here are some of the requirements:

- Stairways require signage at each floor.
- Step treads must be marked with contrasting stripes.
- Fire alarms must give off visual as well as audible warnings.
- Wall-mounted, protruding objects, like ashtrays, may not project more than 4 inches.
- Phones must be posted at specific heights with clear space beneath to allow wheelchair access.
- Doors must allow clear openings of at least 32 inches.

— Wendy Talarico

Tax Talk: Filing an Extension

By Irving Blackman

For millions of Americans, April 15 is the day to file your extension. It's easy. Just file Form 4868, Application for Automatic Extension, and you get an automatic four-month extension of time (to August 15) to file your tax return.

Oh yes, the system works. Our office files hundreds of them every year for taxpayer clients. Done right, there are no problems. Can anything go wrong? Yes. But most people don't know what. The fact is, you must pay the "full amount properly estimated as tax" for the year, and any unpaid portion must be sent with the application. This is a clear IRS regulation.

In a recent Tax Court case, the regulation was upheld and the court said the taxpayer must make a "bona fide and reasonable attempt to locate, gather, and consult information which will enable him to make a proper estimate of his tax liability." Where the taxpayer fails to properly estimate his tax liability, IRS can completely void the extension and apply penalties based on the April 15 due date.

The facts of the case are interesting. The Crockers filed for an extension for both 1981 and 1982. They underestimated their true tax liabilities for '81 and '82 by \$59,000 and

\$27,000 respectively. The estimated tax liabilities for these years, as shown on the extensions, were only \$12,000 and \$22,000. The IRS wanted to void the extensions and nail the Crockers for penalties for failure to file timely a return.

The IRS argued that the Crockers were grossly negligent in the preparation of their extension requests. They did not make a bona fide or reasonable effort to locate or obtain the information necessary for a proper estimation of tax liability. The court agreed (Otis B. Crocker 92 TC 57).

Be forewarned. Sure, keep filing for your automatic extensions. But make sure you base your estimates on the information available to you when the extension is filed. Be realistic. It pays to overestimate for three reasons: interest on any shortage is not deductible; an overpayment can be applied to your estimated tax payment for the next year; and — most important — you will avoid any possibility of being challenged by the IRS to void your automatic extension. ■

Irving Blackman, CPA, J.D., is with Blackman, Kallick, and Bartelstein, 300 South Riverside Plaza, Chicago, IL 60606.

Blue Collar Bank Makes Good

While some of New England's banking giants reel under record losses, a Boston bank owned by a carpenter's union continues to grow. Officials of the Massachusetts State Carpenters Union started the First Trade Union Savings Bank in September 1987 after they realized that their \$55 million pension and annuity fund was making some hefty profits for the banks it was invested in. In two-and-a-half years, First Trade Union's assets have grown from \$25 million to \$225 million. More importantly for its customers, it still lives up to its slogan, "Created by and for working people."

The bank's investments have leaned toward real estate and construction ventures, with an emphasis on affordable housing. The bank offered the country's first affordable housing CD, for instance, the funds of which finance affordable housing projects — \$18 million worth so far, resulting in over 200 affordable units. According to executive vice president Thomas Cochrane, affordable housing financing "is the prime thrust of our commercial lending. In the first year alone, we put over half our commercial investment into affordable housing."

Anyone can bank at First Union, and bank officials say many nonunion and an increasing number of nonconstruction workers are beginning to do so. But the bank continues to review mortgage and credit applications with a sympathetic eye toward building and building

trades. For instance, where another bank might view a carpenter's complex employment record skeptically, First Union recognizes that this is just part of the business, says Cochrane. "We look more understandingly on things like multiple employers and down times, and we try not to get too hung up on the standard lending guidelines."

What's more important is the person's demonstrated willingness to repay a debt."

Along with several mortgage options, the bank offers auto loans, personal loans, and a collateralized credit card for people with no or uneven credit histories. For more information, call 617/483-4000. ■



Officials of the Massachusetts State Carpenters Union started the First Trade Union Savings Bank in 1987 after they realized that their \$55 million pension and annuity fund was making someone else some hefty profits. In two-and-a-half years, their assets have grown from \$25 million to \$225 million.

Builders Balk at Affordability Rule

Affordable housing is getting a lot of attention lately, as creative builders and designers turn toward helping those who can't afford homes at today's prices.

But to some developers in Burlington, Vt., a good thing can be taken too far. A number of them are balking at a proposed city ordinance that would require that a certain percentage of new housing units be set aside as "affordable."

City officials say the rule is needed to ensure there is enough affordable housing in the city. Builders say it tips the scales against what is a risky business to begin with. "There's so much risk in development already that this just adds a whole other layer of

risk," Robert Marcellino, a developer with Homestead Design, Williston, Vt., told the *Burlington Free Press*.

Specifically, the ordinance would require that developers building more than five units sell or rent 15% of them at an affordable price. (The city has guidelines that define what is "affordable.")

Besides, city officials contend, the ordinance would allow developers to build more units per acre to offset the reduction in profit caused by the ordinance. The ordinance is working its way through city legislature channels. ■

NFPA Offers Code Info

The National Fire Protection Association (NFPA) has joined with Codeworks Corporation, an electronic database company, to provide an electronic database of summaries of building codes and standards. Aimed at designers and builders, the service is designed to simplify identifying and understanding the codes that apply to any given project.

To use the service you fill out a checklist provided by Codeworks

summarizing, according to company literature "only the requirements which specifically apply to the project and only those enforced in the jurisdiction in which the project is being built."

Marshall Gram of Codeworks says the code summaries translate the technical language of the actual codes into plain English. "But the technical content is the same," he says. "These reports are designed to give you the information you need to build the building." Gram says the reports include not only regional codes but municipality-specific code amendments for many areas. Turnaround time is 24 hours.

Using the service requires that you become a Codeworks customer, at \$195 the first year and \$100 per year thereafter. The reports themselves cost another \$35 to \$475, depending on how extensive they are. In 1990, says Gram, the service will add all the codes for the renovation market, as well as state codes that cover public access buildings.

For more information, contact Codeworks at 1225 19th St. NW, Suite 750, Washington, DC 20036; 202/778-6300. ■

This database should simplify when and where fire codes apply.

and send it to the company. Codeworks then searches its database of summaries of the code and standards areas you requested, including building, plumbing, mechanical, energy, handicapped accessibility, NFPA's Life Safety Code, and fire prevention. The company then sends you a customized report

N.H. Protects Stone Walls

Sometimes, what goes down must come back up. Such is the case now with stone walls in New Hampshire. New Hampshire's Department of Transportation (DOT) has declared that whenever road work requires tearing down a "significant" stone wall, the DOT will rebuild the wall nearby.

The new policy was announced in the midst of controversy over 17,000 feet of old stone walls due to fall before a road-improvement project in the central N.H. town of Webster next June. Unfortunately, said DOT officials, the policy won't apply to the Webster walls. The state has, however, worked out an agreement with the residents there, who have

been fighting the project for over a year.

Under the new policy, replacing any walls that have to be moved with cost the state \$40 to \$50 per lineal foot of wall. In exchange, the landowners in question will have to sign over to the state a conservation easement agreeing not to deed the wall away or destroy it.

Leon Kenison, director of project development for the DOT, says he expects the state will have to rebuild about three or four walls in a typical year. And what makes a wall significant? "Basically, any wall that's physically significant at all," says Kenison. "It'd have to be a trash heap not to qualify."

From now on, if New Hampshire road builders have to tear down an old stone wall, they have to rebuild it elsewhere — at \$40 to \$50 per lineal foot.



Computer Bits:

Subcontractors can do job costing, time and materials billing, and inventory with Construction Data Control, Inc.'s (CDCI) Professional Subcontractor software program. Contact CDCI (a Weyerhaeuser affiliate) at 3675 Crestwood Parkway, Suite 400, Atlanta, GA 30136; 404/279-0304.

Project scheduling software is available through Software Shop Systems' offering of Pertmaster Advance, a product of Pertmaster International Ltd. Of London, England. Contact Software Shop Systems at Rte. 34, P.O. Box 728, Farmingdale, NJ 07727; 201/938-3200.

"Who-What-When" is a time-management software program from Chronos, Time Management Software. Contact Chronos at 555 De Haro, Suite 240, San Francisco, CA 94107; 415/626-4244.



Olive Branch for Preservationists

The growing sentiment for preserving history isn't always focused on buildings. A number of cities and counties across the country have enacted tree preservation ordinances that

The tree relocation project will cost nearly \$1 million.

carry stiff fines for violators. In areas without legislation, a growing number of builders and developers are voluntarily preserving historic trees.

One such developer, Lewis Homes of California, based in Upland, is temporarily relocating a grove of 100-year-old olive trees for later replanting on a 640-acre planned community site. Originally, the trees were part of a 3,000-tree orchard

planted in the 1880s on the San Bernardino Rancho, a Spanish land grant. For years, the site has been left untended.

Lewis Homes plans to remove over 1,000 trees to a makeshift nursery until site construction begins in 1991. They have hired a horticulturist to choose the healthiest specimens. The trees scheduled for relocation will first be pruned to reduce chance of injury to root systems. Because of the hardness and unusual longevity of olives trees, losses from the transplanting aren't anticipated.

Lewis Homes expects the tree relocation project to cost nearly \$1 million. Beyond the obvious environmental reasons for saving mature trees, preservation also makes good sense politically and economically. City officials often look more favorably on projects that add to the community and preserve some of its history. ■



Lewis Homes, of Upland, Calif., has relocated 1,000 olive trees in this nursery in order to build a 640-acre planned community. Once construction is completed, the trees will be replanted.

N.J. Builders Trade Liability for Radon Costs

Builders in all or part of nine counties in New Jersey will have to meet construction standards designed to retard the infiltration of radon gas. The standards will apply to homes, apartments, nursing homes, schools, and child-care centers.

In return for building to radon-mitigation specifications, builders will be exempt from liability should a building develop a radon problem. Charles Decker, director of the Division of Housing in the state Department of Community Affairs, says the proposal benefits builders in that way. The obvious benefit to consumers, he says, is that it will cost far less to include radon-mitigation features in new construction than to retrofit existing homes. The measures aren't complicated, Decker says: "Any builder could do this. In fact, any accomplished handyman could."

The law attempts to assure that new buildings will contain

air at or below the federal action level of 4 picoCuries per liter (pCi/l), although a state study indicates that levels well below 4 may increase the risk of developing lung cancer. Builders will not have to test for radon in homes that incorporate the radon-mitigation measures. Owners who test and find high levels have only to buy and install a fan to activate vents already installed by the builder.

Builders will have to comply with the radon construction standards to get a permit in the areas that studies show are most likely to develop radon contamination. Subject to the standards are all of Hunterdon County, nearly all of Sussex and Warren counties, and parts of Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset counties.

The state legislature authorized the Department of Community Affairs to prevent future radon contamination above the 4 pCi/l level by altering the

Uniform Construction Code. The department has proposed that builders in the high-risk areas:

- Install a 6-mil or heavier continuous vapor barrier in basements and slabs or over soil in crawlspaces, or overlap seams 12 inches.
- Place basement and slab floors over a base course of 4 inches or more of clean gravel or crushed stone.
- Equip basement slabs with interior foundation drains with a solid 3-inch-diameter vent pipe in conjunction with the drain tile system. The vent pipe must terminate 6 to 12 inches above the slab or out side.
- Refrain from using basement slabs without a piped drainage system unless the sub-slab aggregate is equipped with a 3-inch solid vent pipe with "T" fitting for every 1,500 square feet of slab area. The pipes must terminate 6 to 12 inches above the slab and be capped or connected to an independent vent stack that terminates outside. ■

NAHB Pushes Strict Smoke Detector Laws

Smoke detectors are one of those universally praised items, like seat belts and child locks on medicine bottles. They make sense, and as many as 80% of American homes have at least one installed.

But according to the National Fire Protection Association (NFPA), as many as one-third of all those smoke detectors don't even work. Either the batteries are dead or they have been taken out and used somewhere else in the household.

The National Association of Home Builders (NAHB) is pushing for tougher laws for smoke detectors, both in new construction and existing houses. They are urging regional building codewriting bodies to require that smoke detectors be hardwired and have a battery backup. NAHB prefers this requirement to the alternative of mandatory residential sprinkler systems, which it is lobbying against.

Currently, all building codes call for smoke detectors of some

kind in new construction. Most require that they be interconnected, so that if one detector is set off, all the detectors will be set off. Most codes already call for the smoke detectors to be hardwired, but few require battery back-up.

NAHB is also pushing for state legislatures to adopt laws that require hard-wired smoke detectors be installed in existing homes when a house is sold.

While there is disagreement over how best to protect against fire, whether it be smoke detectors or sprinklers, fire safety remains a critical issue. NFPA reports that more than 6,000 died in residential fires in the U.S. in 1988 – an increase of 8.7% over the year before. ■