NOTEBOOK

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New Directions in Building Inspection

Building inspectors are like police officers: They're never around when you need them. With a nationwide building boom in progress, many municipal building departments have found themselves shorthanded, forcing builders to wait days or even weeks for required inspections. But at least two localities have recently launched programs meant to streamline the inspection process, without compromising building quality.

So many red flags, so little time. In April of this year, Mecklenburg County, N.C. — which includes the city of Charlotte — adopted a new inspection fee schedule that it hopes will reduce overall inspection failures, enabling its 90 building inspectors to do their work more quickly and efficiently.

"The problem was never a shortage of building inspectors," says Bobbie Shields, director of the county engineering and building standards division. "The problem was too many failed inspections." Last December, he notes, the failure rate for building trades inspections was nearly 40%. (For the purpose of calculating failure rates, each required re-inspection is counted as a separate item. If a project requires 20 individual inspections, five of which yield red flags requiring a re-inspection, the failure rate would be 25%.)

Carrots and sticks. Under the new system, which was drawn up by a task force of builders and county officials, a 15% inspection failure rate serves as a benchmark. If a permitted project fails 10% of its inspections, for example, the builder receives a 10% credit toward the cost of permit fees already paid. A zero failure rate earns a 20% fee reduction.

Poor performance, on the other hand, can be costly. Mecklenburg County builders who fail 20% of their inspections now see their fees increase by 5%. As performance worsens, fees continue to increase, up to an attention-getting 50% hike for those who fail 50% of their inspections.

The revised rules contain other incentives and disincentives as well. Builders who achieve failure rates of 10% or less are guaranteed an inspection within 24 hours of requesting it. By early summer, the county expects to offer an additional service on a voluntary basis: Each builder will be able to assign identification numbers to up to five superintendents, project managers, or foremen. The building department will then track inspection failures by number, allowing the builder to see which employees are breezing through inspections and which may be having problems.

The most controversial element, however, is scheduled to take effect next April, when the building department will begin posting the failure rates of individual contractors on a public area of the Internet.

According to Matt Swyt, a Mecklenburg

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Window Makers Reluctant to Advise Installers

Some builders have expressed frustration that window manufacturers can't agree on consistent instructions for installing windows (see "Working With Vinyl Windows," 1/00). Several groups, including BETEC and AAMA, have been working for years to promote more uniform window installation instructions. Recently, these efforts suffered a setback when lawyers representing window manufacturers, who fear liability issues, refused to back a plan to certify window installers.

The Building Environment and Thermal Envelope Council (BETEC) is a non-profit organization that serves as a neutral bridge between government and industry. In the wake of increasing reports of damage caused by water entering walls, BETEC began work in the early 1990s to promote standardized procedures for window installation and develop an installer certification program. In November 1997, the American Architectural Manufacturers Association (AAMA), an organization of window manufacturers, told BETEC that AAMA was developing its own program to certify window installers. Upon hearing the news, BETEC deferred to AAMA and discontinued

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The installation instructions provided by window manufacturers vary widely, leaving some builders scratching their heads.

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County homebuilder who served on the code compliance task force, the posted rates will only reflect actual failures, not administrative failures, such as those caused by a home being locked when an inspector arrived. Some prospective homebuyers will check the posted rates, Swyt believes, but he suspects that most will take a more direct approach. "It's still going to be more accurate to walk up and down the street and talk to his customers," he says.

Third-party inspections. The city of Fort Worth, Texas, meanwhile, has taken a different approach: Rather than look for ways to lighten its inspectors' workloads, it has simply added more inspectors. The additional building inspectors, however, don't work for the city, but for several private companies authorized to perform plan reviews and inspections. Since the program was launched in March of 1999, third-party inspection firms have come to handle about 15% of the inspections previously performed by the city.

That is not noteworthy in itself. Many municipalities — particularly smaller ones — hire third-party inspectors under contract to provide such services. What is unusual is that the Fort Worth inspectors are not hired by the city, but directly by the builders themselves — effectively making building inspection into a subtrade like electrical work or plumbing.

Show up nice. According to Fort Worth building official Al Godwin, that arrangement is ideal for builders because it allows them to develop a working relationship with the inspection firm of their choice. "If you hire one company and get used to working with them," he says, "they're part of the team just like everyone else. You can plan your bids better because you don't have to throw in that added fudge factor." Some city inspectors, Godwin concedes, can be difficult to work with. "Their attitude is 'Do it my way, or do it somewhere else.' If you're a third party inspector and you don't show up nice, you don't come back."

Ron Formby is a Fort Worth contractor whose company, Antares Homes, builds 80 to 100 houses per year. "Just before the city went to third-party inspections, plan review was taking 30 to 40 days," he says. "Now it's just a few days." He notes that third-party firms provide special services for builders willing to pay for them, including evening and weekend inspections.

On the up-and-up. To some, the image of builders and building inspectors operating on such cozy terms might seem suspect, but third-party inspectors and city officials insist that the new approach contains safeguards to prevent abuse. "We're serious about quality control," Al Godwin says. "We go behind the scenes and check one out of every ten plan reviews and inspections."

Tom Killebrew is a former Fort Worth building inspector who now owns and operates a third-party inspection firm, Metro Code Analysis. "I'm happy as a tick," he says. "I'm not going to risk my livelihood because someone's not going to build something right." Business is so good, in fact, that Killebrew's firm, which now employs ten field inspectors, is actively training more. The company holds free classes four evenings a week, geared toward preparing attendees for the ICBO exams.

But even if third-party inspections catch on everywhere, Killebrew believes, there will always be a place for the traditional city building department. "It's profitable to work with a company like Choice Homes or Kaufman and Broad," he says, "but if you're talking about one or two custom homes or a little $10,000 remodeling project, a third-party firm would have a hard time charging fees high enough to make it worth their while. The city has to provide those kinds of services whether they're profitable or not."

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the development of its certification program.

Last August, Larry Livermore, installation program manager at AAMA, was touting the upcoming program. "The AAMA training and certification program will be up and running some time after the first of the year," said Livermore. However, AAMA recently announced that instead of offering a certification program, it will launch an "installer registration program."

Holding installers at a distance. Reportedly, the Window and Door Manufacturers Association (WDMA) put pressure on AAMA to back away from certifying window installers, because of worries that the manufacturers might be held liable in moisture penetration lawsuits. "Certification is really a concern on the part of our legal team," says Alan Campbell, president of WDMA. "The certification label brought the window manufacturers a little closer into the window installation procedure than they wanted to be. We didn't want to give the perception that we were somehow standing behind the work of the installer."

BETEC, meanwhile, feels double-crossed. "Frankly, we're disappointed, to say the least," says Herb Yudenfriend, chairman of BETEC's fenestration research coordinating committee. "AAMA made a commitment. We disagree with their claim that their registration program is the same as a certification program." BETEC is pinning its hopes on the new ASTM standard, "Standard Practice for the Installation of Exterior Windows," now in draft form. "It's a very imposing document," says Yudenfriend. Some observers have noted that the unwieldy standard, which is nearly 200 pages long, strives a little too hard to be comprehensive.

Eventually, the issue of who is responsible for determining window installation procedures may well be established by the courts, as window manufacturers, architects, and builders are all dragged into construction-defect lawsuits.

OFFCUTS

Heads up! Ni-cads falling! DeWalt is recalling 755,000 of their 18-volt battery packs after customers discovered that the batteries can fall out of the tools when their faulty clips let go. The recalled batteries, model number DW9095, were sold in late 1997 and early 1998. Owners of the defective batteries can call 877/457-0478 for a free repair kit.

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 today.

Hundreds of television viewers called to complain when a cable station stopped its 18-hour-a-day broadcast of a fire crackling in a hearth. Customers of Shaw Cable in Victoria, British Columbia, got used to the video flames when the station chose the all-ember format over the Christmas holidays. *Hearth & Home*, a periodical for the fireplace industry, headlined the story, "The Demise of Intelligence in North America," and expressed dismay that the public can't tell the difference between a TV screen and a fireplace screen. The industry may be contributing to the public's confusion, however: The same issue also contained an advertisement for a gas fireplace with a hand-held remote control.

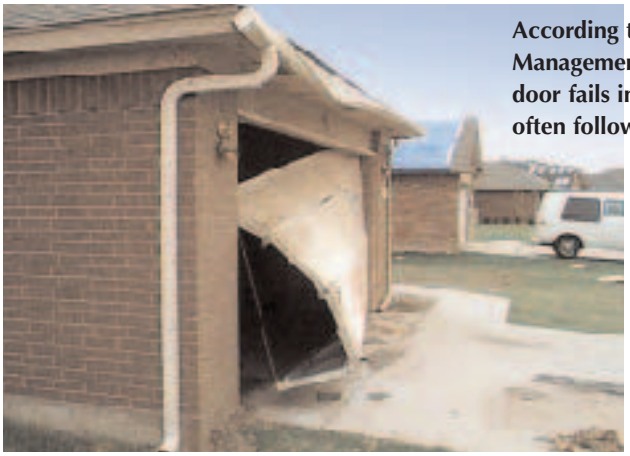
Portland cement sales increased 5.7 percent in 1999, reaching a new record of 104.9 million metric tons. According to the Portland Cement Association, the U.S. cement industry operated at capacity limits in 1999. Imports were at record levels, with both Canada and Thailand exporting over 5 million tons of cement and clinker to the U.S.

Anti-development candidates are in control of the Board of Supervisors of Loudoun County, Virginia, according to *Environmental Building News*. Anticipating a series of lawsuits from home builders, the county has established a $1 million legal defense fund.

Garage Doors a Weak Link in High Winds, Report Finds

Even the best constructed wood-framed structure has no chance of surviving a direct hit by a violent tornado. As a result, building codes in tornado-prone areas seldom require residential builders to take special measures to prevent wind damage. Small in-home tornado shelters, or "safe rooms," can provide a safe place for a home's occupants to wait out a storm, but do nothing to prevent damage to the home itself (see "Hunkering Down in Tornado Alley," *Notebook,* 10/99).

But because buildings can survive the strong winds found at the periphery of powerful tornadoes, and even a direct hit by the vortex of a weaker storm, builders in affected areas may someday be required to take stronger steps to reduce tornado-related property damage. A recent Federal Emergency Management Agency (FEMA) report, *Midwest Tornadoes of May 3, 1999: Observations, Recommendations, and Technical Guidance*, is likely to have a bearing on future building-code revisions in the affected area.



According to the Federal Emergency Management Agency, once a garage door fails in a tornado, roof uplift often follows.

The study's authors found that many failures resulted from punctures caused by wind-driven missiles, such as bricks from poorly secured veneer or inadequately attached chimneys. Once a structure's envelope has been breached, it becomes, in engineering terms, a "partially enclosed building," subject to internal as well as external wind pressures. Since wood-framed homes aren't designed to withstand such loads, catastrophic failure often follows.

That problem was especially evident with garage doors. Because many of the garage doors in the area affected by the May 3 tornadoes were not designed to withstand powerful suction or pressure loads, they buckled and collapsed. Once the garage doors failed, internal pressurization caused roof uplift, often resulting in failure of the walls and roof.

According to Joe Hetzel, technical director of the Door & Access Systems Manufacturers Association (DASMA), a number of manufacturers produce wind-resistant garage doors, but it's up to the builder to select one that meets the wind-pressure requirements of the local code. "I expect that we will be working with FEMA on any future standards," he said.

To obtain a copy of the report, call 800/480-2520 and request FEMA 342, or find it online at www.fema.gov/mit/bpat.

Shrinking Insulation Boards Plague Roofers

Recently, roofing contractors have been complaining that some polyisocyanurate rigid insulation boards have been shrinking after installation. "We're seeing a fair amount of shrinkage in the boards," says Dick Baxter, president of CRS, a roofing contractor in Monroe, N.C. "Most of the time you can see the gaps between the insulation boards without even removing the roofing. I've seen gaps of more than two inches."

Joe Pillus is a roofer in Port Jefferson Station, N.Y., who put polyisocyanurate insulation and a new roof on a school. "I was on the roof on the final punch walk-though," says Pillus. "It had to be 110 degrees that day. I heard the iso board popping out of the asphalt. The boards were curling before our eyes. Eventually, we ripped off the roof. The iso board had curled like saucers. Some of it had shrunk. We did the whole roof again, the same way, and it is curling again. Now we are pursuing them in court."

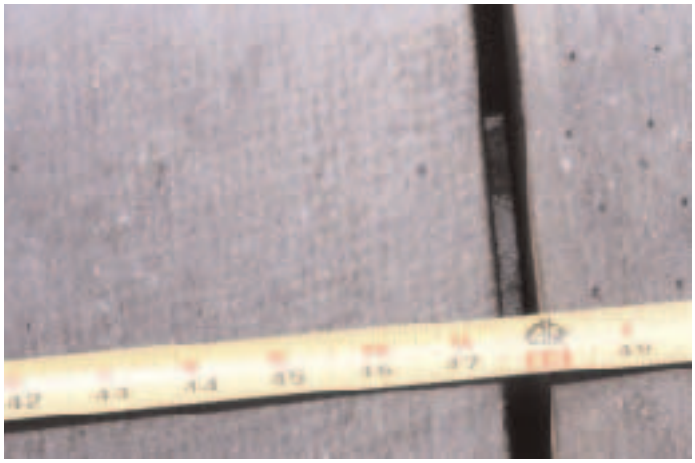
Curiously, unstable polyiso insulation boards sometimes shrink, and sometimes expand. "When the boards expand, they can buckle," says Baxter, who has been involved as a consultant in a half-dozen cases of problem polyiso. "The boards blow up between fasteners, so the roof looks like waves on the sea. In one case, the 48-inch boards expanded to almost 51 inches wide."

All of the reported problems with polyiso insulation board involve the glass-faced or organic-faced insulation boards used under roofing, not foil-faced insulation boards. Even critics of polyisocyanurate admit that these problems show up in only a small percentage of the polyiso insulation boards sold. "Probably only 5 percent of what gets out there goes bad," says Baxter. "Polyiso is generally usable. But when the stuff acts up, it is terribly troublesome and expensive."

What's causing the problem? Polyisocyanurate manufacturers are reluctant to admit to any manufacturing problems. "We're not seeing an epidemic of problems," says Lorraine Ross, technical director for the Polyisocyanurate Insulation Manufacturers Association. According to Richard Rowe, technical manager at Atlas Roofing of Atlanta, Ga., a polyisocyanurate manufacturer, problems are rare. "There have been cases of dimensional instability, some cases of shrinkage," says Rowe. "These cases have almost always been associated with moisture exposure after delivery to the job site."

The National Roofing Contractors Association (NRCA) attributes the problems to one of several possible causes — either an "off-ratio foam mix" or insufficient curing time before the insulation is shipped. Reportedly, manufacturers have had some problems making the switch to more environmentally friendly blowing agents. "They've gone CFCs to HCFC to pentane," says Baxter. "It's an experimentation time for the manufacturers." However, manufacturers deny having problems with the blowing agents. "The manufacturing process with the hydrocarbon blowing agents is not any more or less difficult than the HCFC blowing agents," says Rowe.

Surprisingly, though, rigid insulation that shrinks by as much as two or three inches probably meets the existing ASTM standard for polyisocyanurate insulation. This standard, ASTM C 1289, references a test for dimensional stability. "The ASTM test requires you to take 12 inch by 12 inch samples and expose them for seven days to a variety of conditions," says Ross. "The maximum variation for dimensional stability is 4 percent."



Some roofing contractors have reported problems with polyisocyanurate insulation boards shrinking or expanding after installation.

The NRCA has raised questions about this test. According to NRCA technical bulletin 2000-3, "ASTM C 1289 allows up to a 4 percent linear change … The ASTM methodology involves small-scale tests. However, if the standard is applied to a typical 4-foot by 8-foot polyisocyanurate insulation board, it would allow for shrinkage or expansion of up to 3.8 inches in the long dimension."

Several contractors have ongoing disputes with polyisocyanurate manufacturers. "The manufacturers' reps are typically non-responsive," says Baxter. One result of these problems is a possible change in the existing ASTM standard. "At a recently completed ASTM task group meeting, the proposal had been floated to reduce the allowable maximum for dimensional stability to 2 percent," says Ross. In the meantime, the NRCA is now recommending that roofers install cover boards between any polyiso insulation and the roofing. This layer of cover boards can consist of glass-faced gypsum board or rigid fiberglass insulation. The cover boards, it is hoped, will either reduce the chance of polyiso shrinkage, or at least bridge any gaps that might open up.

OFFCUTS

New home sales reached a new high in 1999, according to the U.S. Department of Commerce. The overall sales figure of 904,000 represented a 2% increase over the 886,000 sales reported in 1998.

Soybean, peanut, and alfalfa farmers in Union County, N.C., are using a fertilizer made from recycled drywall to add calcium and sulfur to their soils. Builders pay the manufacturer, Union Gypsum, $15 a ton to collect their scrap — half the cost of sending it to a landfill — which is then ground and sold to farmers for $5 a ton. The company soon hopes to begin adding processed poultry waste to the mixture to create a more complete fertilizer.

A $1,000 "smart house" option will soon be offered by the Los Angeles home-builder Kaufman and Broad. The package, which the company calls Aladn, will enable the homeowner to control the home's heating, cooling, lighting, and appliances through the Internet. The company expects to include the feature in most of the 24,000 homes it expects to build in the western states next year.

Two Stanford University sophomores have been ordered to remove a 10-square-foot treehouse they were building in a campus oak, the *Stanford Daily* reported. "The police have stopped our awesome treehouse, because they do not want to be asked why they did not know about it," one of the students said. But Imogen Church, the manager for undergraduate housing, defended the action. "People can't just start building without an appropriate permit," she said. "There is a whole process they have to go through. First the treehouse has to conform to safety rules and the ADA [Americans with Disabilities Act] guidelines."

SIPs Give Shelter from Arctic Storms

Last year, a Canadian manufacturer of structural insulated panels (SIPs), Thermapan, designed and delivered a small building intended to shelter Arctic explorers.

The 12x24-foot hut was erected on Ellesmere Island, where it became the most northerly house ever built in Canada.

Adventurers Grame and Lynda Magor and their two-year-old daughter, Keziah, spent the winter in the hut as part of the Sverdrup 2000 Expedition, which retraced the steps of the 19th-century Norwegian explorer Otto Sverdrup.

Last year, a SIPs hut assembled on Ellesmere Island by arctic explorers became the northernmost residence in Canada.

The panels for the hut were helicoptered to the building site and assembled by the Magor family, with help from two Norwegian expedition members. The panels were faced with OSB, which was left exposed on both the interior and the exterior.

"A big problem in the Arctic is ice-blasting," says Emil Taraba, president of Thermapan. "The winds pick up ice crystals, and the effect is like sand-blasting." The panel's OSB exterior has reportedly held up well. Anticipating Arctic temperatures, the R-28 panels were built with a core of 6 inches of high-density expanded polystyrene foam. The hut was heated with a Norwegian-built diesel stove. "We definitely have used less fuel than calculated," Lynda Magor reported in an e-mail interview. "The hut performed very well for the circumstances we faced. We did have ice forming around the windows which were used for regular ventilation." The coldest temperature recorded at the hut this winter was minus 45°F.

When the expedition members leave the Arctic, the hut will be left behind to serve as an emergency shelter for travelers.