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EIFS Under Scrutiny

by Chris Kidder

Foam and stucco failures have created an uproar in North Carolina

Last August, Allen Golden, assistant director of the New Hanover County, N.C., building inspectors' office, reported to the municipality that nearly all of the area's 3,200 houses sided with exterior insulation and finish systems (EIFS) might have damaging moisture inside their exterior walls.

Spurred by homeowner complaints, Golden had inspected 31 houses covered with EIFS. He had found excessive moisture in all but two, and several had substantial rot. Although Golden's initial sampling was not statistically sound, his results proved to be accurate. Since August, inspectors have found moisture problems in 98% of 300 randomly selected EIFS-sided houses in Wilmington, Charlotte, Greensboro, Raleigh, Fayetteville, and the Outer Banks.

In most cases, according to the building professionals who inspected the homes, damage affecting structural members could not be visually detected without cutting

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CONSTRUCTION INTERFACE SERVICES

North Carolina investigators examining wood structures beneath EIFS exteriors have uncovered hundreds of hidden problems. Moisture levels above 50% are common, inspectors report.

Watch for Changes in the 1996 *National Electrical Code*

by Chuck Green

National codes change regularly, but builders often don't hear about the changes until an inspector finds a violation on site. The 1996 *National Electrical Code* has introduced more than 2,000 changes, many of which might apply on your next job.

I found a good illustrated guide to the changes, *EC&M Illustrated Changes in the 1996 National Electrical Code*, by Frederic Hartwell (EC&M Bookstore; 800/654-6776). But the changes are complicated: Even after reading the book, I still needed to consult with an electrician and an electrical inspector for clarifications.

To learn all the changes, you'll have to study the code. But this short list of important changes might help you avoid some unpleasant surprises:

- **When running an underground service line,** the changes make it easier to deal with interference from solid rock. The wiring must be in an underground raceway up to the rock, but can then run over the rock, covered with 2 inches of concrete (left).
- **No open conductors** or open wiring can be run for temporary use (except for emergencies and tests). Hartwell points out that this rule "will also, if enforced, obstruct virtually every hard-wired Christmas and other seasonal lighting display in the country."
- **Construction site requirements** are changed. All existing receptacles used for construction work must have GFCI protection. However, you can meet the requirement by using a listed GFCI cord set (the language of this change is confusing, but the intent is clear).
- **All kitchen countertop receptacles** must have GFCI protection, not just those near a sink. Refrigerator and

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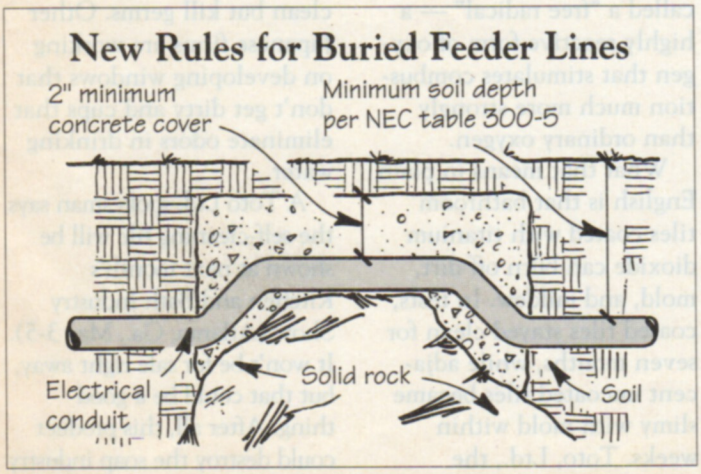

The 1996 NEC allows underground electrical service lines to run directly over rock, covered by a 2-inch concrete cap.

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into the wall. But under a seemingly intact surface, moisture readings of 50% or more were common.

Golden has concluded that the problem is generic. He found that it didn't matter who built a given house, who applied the EIFS, or which of the more than 50 EIFS systems on the market was used — all were susceptible to damage.

Alarmed reactions. In response to Golden's report, one Wilmington bank stopped making loans to contractors for EIFS-clad spec houses. Some homeowners and spec builders, fearful that EIFS would keep their houses from selling, removed the EIFS and re-sided with other materials.

By October, EIFS homeowners had formed SHOC, the Stucco Home Owners Committee. (In North Carolina, where true three-coat stucco is virtually unknown, homeowners have commonly called EIFS "stucco," in spite of its different nature.) Because homeowners insurance coverage specifically excludes rot and latent defects, homeowners looked elsewhere for compensation. A few have sued their builders, EIFS manufacturers, and even the county building inspectors; others are considering a class-action lawsuit.

Claims have been filed against builders' liability policies, but none have been settled, says John Hicks of Glasgow Hicks Co., insurance agents in Wilmington. "The contractors' insurance companies are very concerned. We don't know how long it will take. It could be settled next month, or it could drag on for years."

Same old story? Though they came as a surprise to North Carolina builders, architects, homeowners, and code officials, the problems Golden found were not news to the EIFS industry. In commercial construction, where it was first introduced, EIFS has a long history of water-intrusion problems. "There are published reports that contain everything I'm discovering now," says Golden.

But Keith Hayes, a spokesman for the EIFS Industry Members Association (EIMA), says the North Carolina case is an extreme example. "There have been isolated problems with houses in other areas but never a preponderance of houses leaking in one location," reports Hayes. "From our perspective, this is a very unique situation."

The industry estimates that 3.2% of the nation's single-family wood-frame homes are sided with EIFS. A study released in January by the National Association of Home Builders (NAHB) acknowledges problems nationwide but says the extent of the damage in other areas is unknown.

Source of the problem. EIFS is a generic term for a group of synthetic stucco-based wall systems consisting of exterior sheathing (usually plywood), adhesive, and expanded polystyrene, covered with a membrane of plasticized Portland cement reinforced with fiberglass mesh. A pigmented acrylic polymer topcoat usually provides the final weather seal.

There is disagreement within the industry on almost every aspect of the North Carolina EIFS situation, except one: The problem with EIFS, if there is one, is that the product's waterproof finish won't let water out of a wall once it gets in. Water leaks into EIFS-covered exterior walls around window or door frames, roofs, penetrations like hose bibbs and electrical outlets, and other architectural details. The inability of EIFS to drain or evaporate moisture leads to moisture readings in excess of 20%.

No certain fix. Experts cannot agree about what will fix existing problems, especially in cases where moisture readings are below the rot threshold. "I suspect that just putting caulk around windows won't solve the problem," says Tom Kenney, an engineer at the NAHB Research Center in Maryland.

"It doesn't take a rocket scientist to figure you'll have rot," says Allen Golden

While early reports from Wilmington pegged the "average" repair cost at more than $25,000, that number now appears to be too high. Inspections by EIMA support Golden's statistics about damage incidence, but EIMA says that roughly half the homes with moisture problems can be repaired for less than $3,000.

Experts also say the problem is preventable with good installation details. "There are some pretty easy fixes for future construction," Kenney says. "We know now that there's clearly a level of detailing required to successfully use EIFS." NAHB and EIMA are both working on builder training and installer certification programs.

One synthetic stucco expert we spoke with believes reported problems in North Carolina result from faulty installation and detailing. He says there are hundreds of EIFS homes in his city and few reported problems. But Golden counters that while many builders told him that their EIFS homes were problem-free, when Golden inspected those homes and probed beneath the siding, he encountered excessive moisture in most cases. He predicts that many undetected problems will surface around the country over time.

Golden believes that EIFS' moisture problems are inherent, and should be solved by the manufacturers. He says that EIFS was not intended for use over a wood frame, and he wants North Carolina to impose a statewide moratorium on its use in residential applications. "When you put up a waterproof jacket but only use water-resistant details, you're going to have problems," argues Golden. "If water gets in, and it does, it doesn't take a rocket scientist to figure you'll have rot. That's why brick, vinyl, and wood all have drainage systems."

Amid the disagreements, almost everyone questions the common claim that EIFS is "maintenance-free." Even if EIFS installation is perfected, unless sealants and building components are improved, someone will need to regularly monitor their performance.

The NAHB report, "Investigation of Moisture Damage in Single Family Detached Houses Sided with Exterior Insulation Finish Systems in Wilmington, N.C." and other EIFS information is available through the HomeBase Hotline (800/898-2842). Additional information is available from EIMA at 800/294-EIMA. □

Reporter Chris Kidder covers real estate and construction issues in coastal North Carolina.