EIGHT-PENNY NEWS

VOLUME 13 • NUMBER 5 FEBRUARY 1995

Reports Prompt Plastic Pipe Investigation

Since 1988, many mid-efficiency gas furnaces and water heaters have been installed with plastic exhaust vent pipes. Marketed under the brand names Plexvent, Ultravent, and Sel-Vent, the plastic pipes are UL-rated to withstand temperatures up to 480°F, and approved for use on noncondensing gas appliances in the 80% to 90% efficiency range.

But recently, contractors in Ontario, who are required to report possible carbon monoxide leaks to the government, have been reporting cases of cracked pipes and separated joints. Although no carbon monoxide illnesses or deaths are known to have occurred, Underwriters Laboratories Canada (ULC) suspended its recognition of all three brands of high-temperature plastic pipe in June of 1994. The Ontario provincial government followed by prohibiting the installation of new furnaces fitted with the plastic pipes, although the ruling was later modified to allow newer versions of Plexvent, Ultravent, and Sel-Vent to be used in repair jobs, pending further testing.

The Ontario Ministry of Consumer and Commercial Relations won't say how many problem installations they've found, but Don Beck, an official at the ministry, said the number of failures was "significant." Most of the reported problems, he said, were "pull test" failures — joints in the pipe separated when pulled. The plastic vent assemblies are supposed to withstand a pull of 100 pounds, Beck explained. But in the field, many joints separated under a manual pulling force of around only 20 pounds. A smaller number of failures occurred when joints opened by themselves, and

continued

Plastic vent pipe joints should pass a 100-lb. pull test, but end-point connections must allow for expansion and contraction.

Watch Out for Tough New Asbestos Regulations

New OSHA regulations governing asbestos exposure on construction sites reduce the permissible exposure level by half. Under the new rules, many materials installed before 1980, including furnace and duct insulation, spray-applied drywall finishes, and vinyl floor tiles, fall into the category of "presumed asbestos-containing material," or PACM. Contractors who encounter any of these listed materials have to adhere strictly to testing and protection guidelines, unless they can provide test data from a qualified industrial hygienist to prove the material contains less than 1% asbestos.

In commercial and public buildings, the revised rules hold building owners responsible for protecting workers from asbestos fibers. On remodeling and demolition sites where asbestos is disturbed, however, the general contractor is held responsible. Even if he hires a specialty asbestos abatement contractor, the GC will have to inspect daily to make sure workers are protected. In addition, any contractor or sub who disturbs asbestos — or any of the listed materials presumed to contain asbestos — must immediately inform all other employers on the site of the asbestos risk. The new rules then require protective measures and monitoring of the rest of the job site to make sure asbestos fibers do not spread.

The standard classifies asbestos-related work into four categories. Class I work involves removing asbestos-containing thermal insulation or surfacing materials such as joint compound. Class II work involves removing asbestos-containing materials such as floor tiles, roofing, or siding. Class III work encompasses repair or maintenance jobs where asbestos-containing materials are likely to be disturbed, and Class IV work is maintenance or custodial work where employees may come in contact with asbestos-containing materials. Class I and II work carry strict requirements for respirators, negative-pressure enclosures, air testing, and medical monitoring, but even Class IV work is covered by restrictive rules. For each category of work, OSHA also prescribes particular training courses.

Enforcement. Complying with the new rules will be

continued

Under the new OSHA regulations, all pre-1980 floor tiles are assumed to contain asbestos unless tests prove otherwise.

STATE BY STATE

Massachusetts. A rebounding economy has Bay State remodeling contractors stretched thin, according to a December report in the *Boston Globe*. Most contractors have a backlog of work, the newspaper says, and many are raising their prices in response to the strong demand.

Rhode Island. The state Labor Department has ruled that all construction contractors must carry workers comp coverage. The ruling closes a loophole that had exempted companies with fewer than three employees (including the owner) from the requirement to buy coverage.

New York. NY-STAR Inc., the non-profit energy-efficiency program, is sponsoring a series of builder workshops in February, March, and April at locations around the state. The day-long sessions will focus on cost-saving strategies for building energy-efficient, healthy, and durable homes. Cost is $125. For more information, call NY-STAR at 518/465-3115.

New Hampshire. Multiple chemical sensitivity (MCS) is a compensable illness under state workers comp law, the state Supreme Court has ruled. The ruling came in the case of a woman who claimed that job-site conditions made her hypersensitive to ink, perfume, and newsprint. The case now returns to the Labor Department's Compensation Appeals Board.

Innovative Glulam Uses Less Lumber

Glue-laminated timbers, or glulams, have gained wide use in recent years as the supply of long, large-dimension sawn timbers has shrunk. The engineered beams, made by laminating shorter pieces of 2x stock together to form large members of virtually any length and depth, have opened up new design possibilities for wood-frame construction. Manufacturers are even promoting the engineered beams as a substitute for steel in large commercial structures like warehouses, where their ease of assembly and fire resistance are viewed as advantages.

In a recent design breakthrough, engineers have developed a glulam that sandwiches a layer of high-strength fiber-reinforced plastic into the lower part of the beam. According to the American Institute of Timber Construction (AITC) in Englewood, Colo., the high tensile strength of the plastic allows the manufacture of glulams that are 30% lighter and 25% less expensive than glulams that rely on wood alone for tensile strength.

Daniel Tingley of the Wood Science and Technology Institute in Corvallis, Ore., inventor of the new beam technology, said that dead-weight design load in large structures can be reduced by up to 60% with the plastic-reinforced beams. Tingley also foresees using plastic reinforcement to stiffen other engineered products, including wood I-joists, laminated veneer lumber, and plywood.

Several structures, including two bridges, have already been built with Tingley's beams, which go by the trade name of FiRP. Two manufacturers, American Laminators of Drain, Ore., and Timberweld Manufacturing of Columbus, Mont., have begun production of FiRP beams. The product will be released to the market when building code evaluation is complete.

For more information, contact AITC at 303/792-9559, or call Melissa Weaver of Fiber Technology at 503/836-2026. □

A new high-strength, lightweight glulam, used here to support a pedestrian bridge, incorporates a layer of fiber-reinforced plastic.

Foundation Flaws Costliest, Study Finds

According to a new study from Canada, interior finish flaws (mostly drywall defects) are the most common complaint about new buildings, but foundation failures are by far the costliest problem for builders.

The information comes from the Ontario New Home Warranty Program (ONHWP), in North Fork, Ontario, a provincial government organization that provides warranty backing for new home builders in Ontario. The warranty group analyzed its database of claim files and ranked problems in terms of both cost and frequency (see tables at right).

ONHWP

Liability claims for foundation failures like this can wipe out a small contractor's business.

Robert Marshall of ONHWP said foundation failures typically cost over $70,000, enough to wipe out a small builder. "Sometimes the repair can cost more than the price of the house," he said, "when the problem could have been prevented for $500 or $1,000." His group's aim is to educate builders about how to prevent such catastrophes. "If they learn too late, they could be in bankruptcy," said Marshall. For more details on the ONHWP study, call 416/229-3807. □

Most Common Callbacks
(Ranking by frequency)

1. Interior finish
2. Windows, doors, and skylights
3. Plumbing
4. Foundation
5. Exterior finish
6. Mechanical

Costliest Callbacks
(Ranking by cost)

1. Foundation
2. Interior finish
3. Plumbing
4. Windows, doors, and skylights
5. Structure
6. Exterior finish

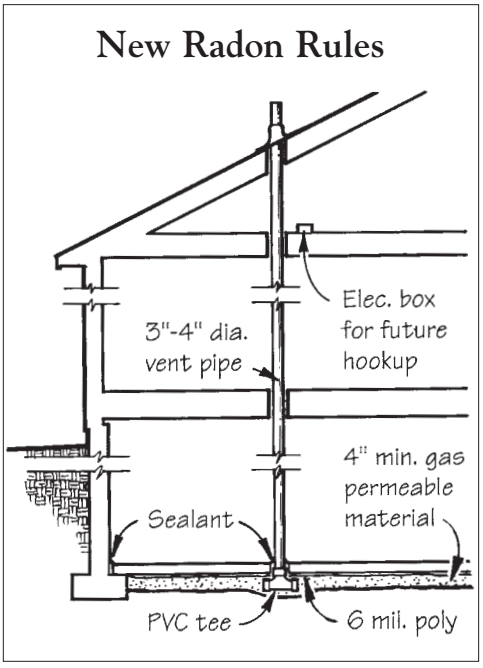
CABO Adopts EPA Radon Standard

The Council of American Building Officials (CABO) has adopted the Environmental Protection Agency (EPA) standard for radon-resistant home construction as part of its 1995 one- and two-family model code. Although some localities have already written the EPA prescriptions into their building codes, CABO is the first national code group to adopt the EPA standard.

According to Jennifer Keller of the EPA's radon mitigation branch, the sub-slab gravel and vapor barriers called for in the EPA standard, as well as the requirement to seal slab joints and penetrations, are already part of the CABO model code. The new element added in the radon standard is a PVC vent stack running from below the slab up through a penetration in the roof, and an electrical supply line and junction box installed near the top of the stack to allow for future installation of a fan in case measured radon levels in the house remain high.

Ron Burton of NAHB's energy and home environment section said that if a builder isn't already providing any of the elements called for by the radon standard, meeting the requirements could cost anywhere from $350 to $500. According to Keller, builders have told EPA that if the slab details are already in the plans, roughing in the vent pipe and electrical supply costs about $50.

The rough-in of the passive vent is mainly intended to lower the cost of an active depressurization system, Keller explained. She added that early data from EPA studies show that the passive venting provided by the stack often cuts measured radon levels in half, making a $250 fan installation unnecessary in many cases. On the other hand, said Keller, if the passive system has not been installed, retrofitting a house with an active system can cost as much as $2,500, with the average cost running around $1,200. □



In addition to sub-slab gravel and poly, CABO's '95 code calls for a passive PVC stack and an electrical box for future fan hookup if radon levels remain too high.

FROM WHAT WE GATHER

The Great Pyramids of Egypt may have been cast from concrete, an archaeologist claims. Joseph Davidovits of Miami's Barry University says he deciphered an ancient Egyptian hieroglyphic carved on a stone tablet and found a description of plans to construct the first pyramid with "minerals and crushed stones." Tests reportedly show that the list of ingredients on the ancient tablet can actually be used to make limestone concrete.

OSHA's Hazard Communication standard now covers wood and wood products if they are processed in a way that creates dust, or are treated with hazardous chemicals. OSHA already requires warning labels and MSDSs for wood dust and wood treated with chemicals. But wood and wood products that are dangerous only because of their flammability will remain exempt from labeling requirements, since that hazard is already well known.

San Antonio Spurs fans know all about getting dunked, especially if they happened to attend the basketball team's Nov. 4 game at the Alamodome. The laser light and fireworks show before the game set off the dome's fire safety system. A high-capacity water cannon sprayed 12,000 gallons on hapless spectators, according to a report in December's *Contractor* magazine. The fans who stayed dry can count themselves lucky — an engineer said the problem would have been worse if the cannon had been in the oscillating mode that night.

Shellac, the old-fashioned wood finish made of millions of tiny insect shells dissolved in alcohol, is still practical for some modern situations, according to a feature article in January's *Old-House Journal*. The nonporous, waterproof shellac is useful, says the magazine, as a knot-sealing primer and as a base coat under modern finishes. And old shellac finishes are easy to restore.

The Vermont lawsuit over carpet toxicity that triggered congressional hearings and scientific debate was settled out of court in September, after the judge in the case refused to allow expert testimony by Rosalind Anderson of Anderson Laboratories in Dedham, Mass. The ruling followed a similar judgement in a North Carolina court case (*Eight-Penny News*, 9/94). In both cases, the judges said Anderson's testimony was inadmissible under Supreme Court guidelines. Plaintiffs in each case had claimed that carpet made them sick. So far, no one has won a judgement against any carpet company on the basis of Anderson's mouse experiments.

Cellulose fiber insulation is often plugged as a recycled product. But many people may not know that fiberglass insulation also contains about 10% recycled glass, or "cullet." According to the fiberglass industry, fiberglass insulation is currently the largest secondary market for recycled glass containers.

Pipe Investigation,
continued

when pipes and fittings cracked.

Most gas appliances are clean-burning, Beck pointed out, and do not produce high levels of carbon monoxide. He said he knew of only three instances where failed plastic pipes have actually released the deadly gas into a home. All of those cases involved a type of furnace that is known to produce high levels of carbon monoxide.

Few failures in U.S. The United States gas industry is concerned enough about the problem to have started its own investigation. At the request of gas companies and appliance manufacturers, scientists at the Gas Research Institute in Chicago, Ill., have begun an investigation into the possible causes of the problem. Similar research is continuing at the Canadian Gas Research Institute in Toronto, Ont. Actual failures in the U.S., however, are said to be rare. Jack Langmead of the Gas Appliance Manufacturers Association (GAMA) told *JLC* that large numbers of Canadian installations were done with early versions of the plastic pipes. The products entered the American market later, according to Langmead, so that most U.S. installations contain an improved plastic made with a different resin.

Still, gas suppliers and heating contractors told *JLC* they had encountered the problem in the U.S. Plexco, the manufacturer of Plexvent, has pulled its earlier product from the U.S. market and replaced it with a new product, Plexvent II, that is made with the improved resin. Ultravent and Sel-Vent products marketed here had already switched resins.

A spokesperson for Underwriters Laboratories in Northbrook, Ill., said that all three brands are still UL-approved for mid-efficiency appliances. UL plans to hold meetings early this year to examine whether standards for the plastic venting pipe need to be changed.

A problem with the resin might explain pipe cracking. But joint failures could be caused by degradation of the high-temperature silicone sealant used to connect pipes. Although one manufacturer is reported to have developed a new epoxy sealant for joints, installers are still using silicone in many cases.

One theory scientists have suggested is that sulfur-containing exhaust vapor is condensing and concentrating in the pipes. This would expose the plastic and the joint sealant materials to as much as a 50% sulfuric acid solution, far above the test levels of acidity presently required for UL certification. If this theory proves correct, currently available sealants and plastics may not be tough enough.

Faulty installation. Materials may not be causing all the problems, however. GAMA official Jack Langmead told *JLC* that most failures resulted from incorrect installation. In many cases, he said, installers did not properly clean pipe joints with solvent before joining the pipes, or else failed to allow the joints to cure for the specified length of time.

Langmead also said some installers did not allow for movement of the pipe as it expands and contracts with temperature changes. "If you lock both ends of the pipe," said Langmead, "you are guaranteeing that there will be a problem." Udo Dur, a sales representative for Hart and Cooley, the manufacturer of Ultravent, also said installer mistakes had caused the cracking problems his company has seen. "They don't even read the instructions," he argues. "Just because you know how to install B-vent doesn't mean you can install this product without following directions." But Dur said that Hart and Cooley replaces its materials when they crack. "We have a ten-year guarantee," he said. "Even if it's the installer's fault, we usually just replace it. It's not worth it to send somebody out to investigate." Dur stated that fewer than one percent of his company's 200,000-plus U.S. installations have experienced any problems.

According to the National Association of Plumbing, Heating, and Cooling Contractors (NAPHCC), many furnace manufacturers have informed wholesalers that they will no longer approve the three products for use with their appliances. NAPHCC says that one manufacturer is recommending that existing installations be inspected by the installer annually to verify safe vent-system operation. NAPHCC has objected in writing to furnace manufacturers about placing the burden of notification on the installers, saying that the problem seems to center around materials rather than installations.

GAMA spokesman Langmead responded, "Homeowners should have their heating system inspected annually anyway." Contractors should offer that service to customers as part of good customer relations, said Langmead, but not necessarily for free.

In practice, it is often fuel suppliers who inspect systems and discover defects. Jay Maloney, a spokesman for the Vermont Gas Company in Burlington, Vt., said his company's personnel have been inspecting sidewall vent pipes since 1993, when they were first alerted to the cracking problem. Maloney said the gas company has discovered both materials failure and installation-related defects. In some cases consumers call the gas company when furnaces shut down automatically, or "lock out." The automatic lockout occurs when exhaust gas mixes with intake air, causing improper combustion. Typically, Maloney explained, the vents are configured as concentric pipes, with the exhaust pipe running inside the intake pipe, so a leak will cause the gases to mix. Other customer reports have been prompted by an odor near the exhaust vent outside the house. If a furnace is functioning properly, the exhaust gas should be odorless. Maloney also pointed out that systems can be tested by measuring carbon dioxide levels in the exhaust — low levels of CO_2 indicate a malfunction.

When inspecting a system, there are several things to look for. First of all, joints should stand up to a physical pull test: A person should not be able to pull joints apart by hand. Second, with transparent brands of pipe, deteriorated sealant will be visible. Chalkiness or discoloration of the sealant is a sign of silicone deterioration. Third, cracking is often visible to the naked eye. Finally, cracking or sealant failure is often given away by the presence of moisture caused by leaking condensate. □

Architecture Students Get Real Building Experience

Ever looked at a set of house plans and wondered why an interior wall was dimensioned at 12 feet 4 inches when drywall comes in 12-foot lengths? Or struggled with an unnecessarily complicated framing problem that could have been avoided with a minor design change? If so, you've probably wondered why so many buildings are designed by people who don't know much about basic carpentry.

The reason is pretty simple: Most architects get no job-site experience during their formal education.

But that may be changing, as more and more architecture programs offer design-build courses similar to a program for architecture students at Yale. For decades, Yale's First-Year Building Project has required students to design a building, then actually build it — with real hammers and saws, and on a real budget and schedule. Recently, the Yale projects have been Habitat for Humanity houses in New Haven, Conn. — jobs that present the same tough problems as any urban housing project.

Architecture students seem to welcome the chance to get their hands dirty. Architecture students from around the country working at a summer design-build workshop at Yestermorrow Design-Build School, in Warren, Vt., were enthusiastic about getting a chance to swing a hammer. "We don't do anything like this in school," said one. "I've never built to full scale — we just worked with models."

Steve Badanes, an architect who teaches the Yestermorrow architects' course, says the students catch on fast. "Architects aren't stupid," said Badanes, "they just lack building experience. In a few weeks, these people will be more help than a lot of journeyman carpenters." □

Architecture students get their first taste of real construction work in a summer building workshop at Yestermorrow in Warren, Vt.

TAX TALK

Do You Know What You Owe?

Most sole proprietors assume their income tax payments will be roughly the same from year to year. But if you've had an unusually good year, if you and your spouse worked additional part-time jobs, or if you failed to make regular estimated tax payments, you may be underwithheld.

To avoid having to arrange for short-term financing at tax time, follow these recommendations:

- Check your 1994 self-employment net income, keeping in mind that approximately 30% of the bottom line (conservatively) is allocated to Uncle Sam.
- Check your 1994 W-2 wages and income tax withholding against the prior year wage W-2s. Temporary and part-time jobs do not always meet minimum withholding thresholds — meaning that no income tax was taken out of your checks.
- Yes, unemployment compensation is taxable, and no, federal income tax is not deducted.

If you discover an unexpected tax liability, there's still time to do something about it. Request an installment plan (Form 9465) for the 1994 tax liability when you file your 1994 return. Be realistic — the IRS expects reasonable offers with fairly short repayment schedules (no 15-year amortizations).

Finally, file on time — no matter what. The penalty for late filing can be as much as 25% of the tax due. And call an accountant for additional advice.

Martha C. Myron is a Certified Public Accountant practicing in Concord, N.H.

Asbestos,
continued

costly on some remodeling jobs, but failure to comply could be worse: The rules are backed up with the threat of shutdowns, hefty fines, and criminal penalties.

Sources at OSHA confirmed that the agency does not routinely inspect residential remodeling sites. However, OSHA will inspect any job site in response to a complaint, and an official with the agency said compliance officers "would not ignore" asbestos rule violations discovered during such an inspection.

Liability. Whether or not OSHA inspects, contractors can face legal liability if they contaminate a residence with asbestos during demolition or remodeling. Any adverse health effects would probably not surface for decades, but one immediate effect of elevated asbestos levels in the air in a building is a possible loss in market value. In any resulting lawsuit, some courts could consider failure to follow OSHA rules as evidence of a contractor's negligence.

Strategy. Most professional remodelers are cautious about asbestos in residences. On the initial walk-through inspection, they ask the homeowner to have tests conducted on any materials that might contain asbestos. If the tests are positive for asbestos, the contractor explains that work will be delayed until the homeowner has hired a licensed abatement contractor.

However, asbestos is sometimes discovered unexpectedly on a job site, buried in a wall or floor. If that happens, you'll need to know the new OSHA rule. You can order a copy of the rule from OSHA's Publications Office (202/219-8148).

The rule is difficult to understand, but you can consult the OSHA office in your state for help in interpreting it. You should also call your state's Health Department if you encounter asbestos — in most states, asbestos abatement requires special training, a state license, and a permit. □