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LETTERS

Truss Failure Revisited

To the Editor:

I am a structural engineer and have inspected dozens of structural failures involving floor and roof trusses. I can't for the life of me figure how Steven Smulski settled on the conclusions stated in his article, "Flat Truss Failure" (10/93).

Smulski says that excessive heat and moisture in the closed truss space lead to the truss failure. He estimated that the moisture content of the lumber into which the connector plate teeth were inserted fluctuated from 6% to 14%. There is nothing unusual about this range. Most of the basements I inspect have similar fluctuations, yet I don't see the failures he attributes to this moisture cycling.

Smulski writes as if the floor cavity space was an enclosed chamber. I disagree with this assessment. I doubt that the kraft-paper facings formed a continuous surface, so it wasn't an air barrier. In fact, it is a very weak vapor barrier, too. Air would easily pass between the basement and the truss cavity.

The source of the moisture and elevated relative humidity (RH) in the truss cavities during the summer months wasn't *generated* by the cold water pipe. And the vapor that condensed on the cold water line couldn't have appreciably driven the RH in the truss space upward. In fact, there was probably a slight *drop* in RH since moisture was being removed from its vapor phase.

Basements have higher RH in summer because they are buried in the cool earth and warmer, humid outdoor air migrates into the basement. And air would be easily exchanged between the basement and the truss space. While it would be nice to eliminate the cold water pipe as a condensing surface, I think the basement conditions are a much greater concern with regard to moisture loading.

I agree with the recommendations provided by Smulski. However, I don't think the source of the moisture was accurately determined, and as a result, the problem may remain unsolved.

Ned Nyle, PhD, P.E.
Westboro, Mass.

To the Editor:

Please ask Dr. Smulski about the physics behind his statement: "… water vapor condensed on the uninsulated cold water supply lines, driving up the relative humidity…." How can water vapor condense out of the air without *reducing* the relative humidity?

Patrick M. McGuire, P.E.
Nappannee, Ind.

Stephen Smulski responds:

Mr. McGuire is indeed correct that condensation on the cold water pipes has the immediate direct effect of reducing relative humidity (RH). In this case, however, it also has the indirect effect of maintaining high RH inside the space during the cooling season because of liquid water trapped in the insulation.

I suggest that Mr. Nyle reread the article, paying closer attention to the wording and details. The truss cavity was never referred to as an "enclosed chamber." It is, however, a closed space. And like a room with its doors and windows shut, the flow of heat and air into and out of the room is impeded, but not prevented. Further, it was never stated nor implied that moisture and high RH in the space was "generated" by the cold water pipe. The pipe served only as a cold surface upon which airborne water vapor condensed and dripped as a liquid onto the insulation. The ultimate sources of the water vapor were, of course, the outside air that infiltrated into the basement, soil moisture migrating through the foundation, and the leaky shower drain. In addition, what wasn't mentioned was that 10 to 12 young adults were living here, showering daily.

Nyle points out that seasonal swings from 6% to 14% moisture content for

wood in basements is not unusual. But in this case, these values represent a conservative estimate of moisture content that was certain to have occurred in the insulated truss space; the actual range was likely much wider. The bottom line is the truss plates didn't just pop out on their own. They were forced out as the wood cupped up and down with changes in moisture content.

Having investigated failures himself, Nyle knows that one never has perfect knowledge of all of the contributing factors, and that engineering judgment must be applied. Unknowns relevant to this case include the wood moisture content at the time of plate embedment; moisture exposure of trusses during storage, shipment, and while on site; and the role played by stress relaxation and compression set of the wood surrounding the truss plate teeth.

As far as Nyle's concern that "the problem may remain unsolved," I further recommended that kitchen, bath, and laundry be vented directly outdoors, that plumbing leaks be repaired, that attic floor penetrations be sealed and ventilation increased, that gutters and downspouts be installed, and that soil around the foundation be regraded.

Seeing Green

To the Editor:

Alex Wilson's editorial ("Green Building vs. Green Hype," 11/93) in the recent "green" issue of *JLC* reads like a breath of fresh air. Finally, someone who knows building materials talks about the welter of environmental claims now being made, about the need to cut through the hype. At their core, most promoters of building materials, environmental or otherwise, are marketers, and so are concerned about saying the thing that will make the sale.

A rule of thumb might be to be doubly skeptical of manufacturers whose main claim is the alleged problems of their competition. Products should be chosen for their legitimate benefits, such as their structural properties, and not just in response to marketing claims that push the right buttons.

Chris Donnelly
Northford, Conn.

No Tears for the Rich

To the Editor:

Enclosed please find a hankie for Irv Blackman. I wouldn't want his crying over tax reform ("New Tax Law Hurts," *Eight-Penny News*, 12/93) to smudge the copy in next month's column.

I think the average person around here probably grosses $25 to $30 thousand per year — about one-quarter of what it would take to worry about the tax rate increases. I have nightmares that my car will break down, not that my business won't be able to write off my country club dues or pay for my family to vacation in Hawaii while I "work."

David Grobe
Plainfield, N.H.

Menu Yes, Windows No

To the Editor:

Gerret Wikoff's letter, "DOS Made Easy" (12/93), hit on a sore point. To be sure, the DOS prompt is enough to petrify any new computer user, but the Windows screen is even more daunting, even for seasoned computer users. Plus, getting Windows to work efficiently can be a career in itself, and who needs that?

Wikoff's approach — using a system menu — is the answer I prefer, and I can suggest an even simpler means of achieving it.

I use a menu called *Direct Access*, which is available in computer stores. It is attractive, easy to install, and all the necessary commands are right on the screen. Adding programs to the menu is a snap. I didn't have to write any batch programs or macros to achieve this, although *Direct Access* will allow that. Let's face it, Windows has some good features, but it isn't anywhere near as easy to use as a system menu.

Robert Fleming
Santa Ana, Calif.

Plastic Laminate Tips

To the Editor:

I would like to add a few tips to Michael Barnes's excellent article "Laminate Countertops On Site" (10/93).

For small jobs, I use 3M's *90 High-Strength Adhesive* spray. It comes in 16.6-ounce cans with coverage of about 6-square-feet per can. It "tacks" in one minute, gives an exceptionally strong bond, and is easy to use.

To cut laminate with the grain, I use a carbide scribe. After a couple of passes along a straightedge, the laminate snaps just like drywall. It's much harder to use the scribe against the grain, so I usually make these cuts with my router and a 1/8-inch straight bit. I use laminate shears for short cross-grain cuts. (Laminate shears have three blades.)

Always inspect the router bit bearings before use. Any friction in the bearing means you should replace it or risk ruining the laminate. I've had a bearing nut come off while trimming a countertop, so I now apply Lock-Tite to all my bearing nuts.

I often install a butcher block to avoid dealing with joints. Contrary to Mr. Barnes's advice, professional laminate installers typically put a joint through the sink to minimize the joint size. I disagree that one should "… avoid plywood, which is neither dimensionally stable enough nor smooth enough for use in countertops." Indeed, plywood was successfully used for years before high-density particleboard was commonly available. I sometimes use plywood over sinks and dishwashers because of its superior strength and water resistance.

I also disagree with Mr. Barnes's recommendation to buy the cheapest possible router. A top-quality laminate router, such as Porter-Cable's, costs only about $90. The inferior bearings in a cheap router make it vibrate more and cut less precisely than a good router. A high-quality router will also last longer, cut faster, and handle better.

Rick Anderson
Bellevue, Wash.

Keep 'em coming…. We welcome letters, but they must be signed and include the writer's address. *The Journal of Light Construction* reserves the right to edit for grammar, length, and clarity. Mail letters to JLC, RR#2, Box 146, Richmond, VT 05477.