Letters

Why the Safety Factor?

Let's be practical concerning the article "Strong Rail-Post Connections for Wooden Decks" (2/05). Looking at it from a contractor's point of view, I have the following observations: The bolted connection passed code, so no further refinement is needed. Perhaps the code already took into account the safety factor, or the code needs to be changed. A 200-pound load applied continuously to a single post — as in the test — is a pretty unlikely scenario.

Readers can certainly choose to overbuild their deck if they don't mind the added cost, but I don't think they will have any more peace of mind.

Rick Barta
Barta and Sun Construction
Shepherd, Mont.

Authors Joe Loferski and Frank Woeste, P.E., respond: Of all structural engineering topics, the subject of safety factors is the most difficult to explain and understand. The intent of safety factors is to compensate for uncertainty — uncertainty in loads and materials, uncertainty in the models used to analyze the structure, and uncertainty in field installation or construction. For a typical application, the goal is to provide a safe structure for a "lifetime" and achieve a failure rate of no more than about 1 in 1,000,000. It is theoretically impossible to design a structure with no chance of failure.

Before going to the deck guardrail post, it may be helpful to examine a more common case that homeowners personally experience every day. In the case of a residential floor joist, the average *occupancy live load is 11 psf, based on published research, yet the* design load *has been 40 psf for decades.*

Assuming an ordinary 2x10 southern pine joist, the allowable *design value would be approximately 1,000 psi. If you were to test several hundred of these joists in the laboratory to the point of failure, the test strengths would range from about 1,300 psi to 13,000 psi. The average strength would be about 6,000 psi. What, then, is the safety factor, or SF, for the joists based on the* average *test value?*

Because the test lasts only a few minutes per joist, the average test value is reduced by a duration factor of 1.6 as well as by the safety factor. For the example of the 2x10, the result is:

$$1{,}000 = \frac{6{,}000}{1.6 \times SF}$$

So, in this case, the safety factor (SF) equals 3.75. By adjusting the average load upward from 11 to 40 psf, and the bending strength downward from 6,000 to 1,000 psi, the result is that people do not need to worry about their floor collapsing throughout their lifetime.

Returning to the guardrail-post case, your point that "the bolted connection passed code, so no further refinement is needed" is analogous to using 6,000 psi for the allowable strength of a 2x10. Without imposing a safety factor, we would expect failure for about 50 percent of the post connections that were exposed to a 200-pound load. Safety factors are used to reduce a 50 percent chance of failure to a failure rate on the order of 1 in 1,000,000.

We used a safety factor of 2.5 from the current building code (IBC), and note that it is significantly lower than the 3.75 calculated for an ordinary 2x10 floor joist. As it turns out, 2.5 is the same safety factor required by the ICC standard AC 174 (Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems), which is used to qualify man-made deck materials — primarily plastic, wood-plastic composites, and vinyl. Aside from the fact that we are inclined to go with the "wisdom of the code," we feel it would be foolish to use a lower safety factor than that required for new man-made materials, which should have less variability than solid-sawn wood products.

Regarding the point about overbuilding, we believe that if contractors give their customers the choice of going with a common bolted guardrail-post connection vs. a connection assembly tested in a lab using a code-prescribed test safety factor, nearly 100 percent of homeowners will choose the tested connection.

No Labor Shortage

Just a few thoughts as a member of that "other minority" that most industry publications — and I mean yours — tend to ignore on most occasions.

Did Mr. Gritmon of Little River, S.C., (*Letters,* 2/05) include the unemployed and underemployed African-American males in his neck of the woods? My quick research shows an unemployment rate three times higher than that of whites. And did he ever think about hiring women? If he is willing to pay a "living wage," I can find him plenty of bodies in my neck of the woods who would be willing to move there if a job is waiting.

His use of the term "Anglo" could be considered offensive in many circles. Reading between the lines, it sounds like Mr. Gritmon bemoans the fact that he can't find any "nice white boys" to come into the biz. Perhaps if he and those like him had not locked out and did not continue to keep out people who look like me, neither of us would be writing about this. Get real.

Kenneth Benson
Chicago

Success in School

I have had the pleasure of teaching the construction trade in middle and high school for over 24 years in the Milwaukee area. In 1989, I was teaching in a suburban district with an enrollment of approximately 5,000 students. While many people felt ours was a model department, the administration decided it would be better if all students were put on a college-bound track. Seventy-five percent of the industrial-technology staff was cut, I was out of a job, and now students sit in study halls instead of having the opportunity to explore the trades.

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In 1993 I was hired by the Mukwonago (Wis.) public schools, where I teach a 12-week introductory course in construction to all seventh-grade students — about 400 per year. They love it! Many students go on to explore one of the trades in high school. Many of my former students are now owners or employed in the construction industry.

My daughter is currently enrolled in a four-year degree program to become a teacher. When she graduates, her beginning salary will probably be around $30,000. My son, on the other hand, has just entered a five-year apprenticeship program. His employer pays for the cost of his education as well as an hourly wage. When he completes the apprenticeship, his salary will be twice that of my daughter's.

It's not that we don't have a generation ready to enter the trades, it's a case of putting too much emphasis on trying to get everyone into a four-year degree program.

Steven Slamar
Park View Middle School
Mukwonago, Wis.

Starting a Training Program

I am writing in response to D.W. Murphy's letter "Help Wanted" in the February issue.

As a contractor, I too have had trouble finding young people to work in the trades. Shop classes are all but vanishing from the high school environment. When the shop teacher either retires or gets pushed out, the shop class is replaced by another type of class. Fortunately, in my area of Marin County, Calif., someone did something about the problem.

Ten years ago, the Marin Builders Association began sponsoring a high school construction class in two local schools. Seventy students completed the class this past year, and 13 participated in a summer internship program. Each year a number of scholarships are awarded to those students who excelled in the class and in the summer internship.

I volunteer to teach at one of the schools. I have a group of six students who learn the practical aspects of construction and how to use tools by stick-framing 6-by-10-foot sheds that are eventually delivered to nonprofit organizations.

I suggest that Mr. Murphy and anyone else with this concern contact their local builders group and local high schools. If you need assistance in getting started, please e-mail me at the4ibi@aol.com; I am glad to help.

Tom Eller
T.H. Eller Construction
Woodacre, Calif.

The Question Not Asked

The article "Getting Into Insurance Work" (2/05) was good reading for anyone wanting to get into this business. However, one question — which poses the most danger to remodelers — was not asked: "Should I accept the insurance company's costs for a given job when they declare that this is the accepted cost for this work in this area?"

The answer is no. A remodeler needs to understand his numbers well enough to know exactly what he can and cannot do a particular job for. The remodeler who blindly accepts the adjuster's cost and scope of work will quickly find himself in trouble — either financially, from not understanding his costs, or with the client, from not understanding the scope.

Mark Labourdette, CR
Certified Xactware Restoration Contractor
Novato, Calif.

Cabinet Pull Layout Jig

The cover of the December 2004 issue shows a cabinet jig that I'm interested in purchasing. Any idea where I can find it? Thank you.

Leo Boucher
St. Leominster, Mass.

Try Align-Rite Tool Co. at www.alignritetool.com or 888/624-1942. The Door and Drawer Drill Guide is available for $49.95.

Setting the Record Straight

Your article "Arizona Cracks Down on Unlicensed Contractors" (*In the News,* 2/05) contained some misleading information.

Almost all of the agency directors in Arizona are appointed by and serve at the pleasure of the governor. In that the new governor belonged to a different political party than her two predecessors, she replaced almost all of the agency heads, including the registrar of contractors, yours truly. The audit was not completed and released for almost two months after my replacement.

Previous to the changing of the guard, I authored legislation that eventually was passed by the legislature and signed by the new governor that addressed most of the concerns contained in the audit, and is enabling the new registrar to go after the bad guys more effectively.

Michael Goldwater
Scottsdale, Ariz.

Correction

*Johns Manville's Spider spray-applied insulation (*Products, *3/05) is a fiberglass product — not cellulose, as our story's title implied. According to the manufacturer, Spider contains about one-fifth the water used in cellulose spray-in applications, which enables contractors to put up drywall sooner. Also, because it is fiberglass, it is mold-resistant without the need for chemical treatment.*

KEEP 'EM COMING!

Letters 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*, 186 Allen Brook Lane, Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.