

LETTERS



Roof Thrust Overestimated

To the Editor:

Gordon Tully's short piece (Building with Style, 2/91) on building second stories with half-walls, or knee walls, was a good, concise primer on outward roof thrust and how to deal with it. A few things puzzled me, though.

First, a second-floor ledger lag screwed into the studs seems like a poor way to resist outward thrust. If the thrust exists, it would be pulling on the threads of the lag screws — not a very positive connection. Second, I wasn't sure why the article mentioned, but then dismissed, the alternative of anchoring each joist sideways into a wall stud. It has some inconveniences, as noted (you have to line up each joist with a stud, and there's no nailing for the edge of the subfloor), but it's a lot better way to hold in the studs if that's what you're worried about.

However — and this is my chief reaction — isn't this whole "problem" of outward roof thrust a little exaggerated? Theoretically it can happen, but my experience is that in practice it's rarely an issue.

One reason and a factor seldom taken into account is the stiffness of the roof plane itself. You can see that for the middle rafters to push outward while the end rafters are held in place by the gable wall, the whole roof has to bend eaveward — that is, the entire rectangle must distort into a curve. If the roof has any stiffness at all (from plywood, or even 2x6 decking) this is close to impossible.

If we're talking about a sagging old barn roof with nothing but shingles on purlins and no bracing, that's a different story. But a modern building? I doubt it. I'm not an engineer, but my hunch is that with four-foot half-walls supporting a plywood-decked roof, plus collar ties, there simply wouldn't be significant outward pressure on the walls, even without balloon framing. I could be wrong. I'd be interested to hear what a good structural engineer would have to say on this issue.

Dan Breslaw
W. Corinth, Vt.

Half-wall Hang-up

To the Editor:

Regarding the Building with Style column, "The Whole Story on Half-Walls," in the February issue, it's no wonder architects get such a hard

time from carpenters and builders.

In a balloon-framed building, the layout is done so that the joists lap the studs and are supported by a let-in ledger board. The joists are then well-spiked to the studs. In most cases, the building is more than one joist length wide. The joists are laid out to overlap at least two feet in the center. If the half-walls are no more than four foot tall the outward thrust is easily resisted by a continuous band of lumber tying each set of opposing studs together.

The idea of lag-bolting a ledger to the studs and using joist hangers is incorrect. Even with the floor nailed to the ledger the outward thrust would be trying to pull the lags and joist hanger nails straight out of their holes. This is many times weaker than the shear load that proper balloon framing places on the fasteners.

David P. Robbins
Monroe, Maine

Gordon Tully Responds:

Mr. Robbins and Mr. Breslaw challenge the idea of resisting the roof thrust with lag bolts loaded in tension. If you "run the numbers" you will find that in a 4-foot high half-wall 2x8 spruce studs fail in bending before a 1/2-inch lag screw with only 1 inch penetration will pull out. Letting in the ribbon or ledger board used in traditional balloon framing is disastrous when the studs act as cantilevers. Just as you wouldn't notch the top of an overhanging porch beam at the wall, you shouldn't weaken an already fully-stressed stud at the point of greatest stress.

I mentioned in an earlier article that I would never use a lag bolt in direct tension to support a porch railing, since the bolt is subject to water penetration which could rot the wood around the bolt and cause sudden failure. However, a bolt attached to the inside face of a stud is quite secure against water, and is greatly overdesigned. As one correspondent noted, far more vulnerable (and commonly underdesigned) joints are those between collar ties and rafters.

Mr. Breslaw raised a point omitted from my article, namely that the roof can act as a diaphragm, transferring the roof thrust to the gable ends and thereby avoiding the need for either cantilevered studs or a ridge beam. He is absolutely correct, providing the roof is properly detailed as a diaphragm. But a properly designed roof diaphragm requires very careful engineering and supervision, and is therefore an inappropriate technology in the low-tech world of home building.

These considerations are normally "invisible" to the builder, buried as they are in the prevailing codes and tradition-

al practices. As soon as the builder does anything out of the ordinary, every aspect of the structure comes into question. My advice is still to check all unusual conditions with a structural engineer.

Finally, I want to reinforce the major point of my article: without a lot of special effort, the balloon-frame approach doesn't work except in very short half-walls. All things considered, a ridge beam seems to me the best solution to the half-wall problem.

I Knew I Was in Trouble When...

To the Editor:

I started to worry when the owner asked for a few extras. I knew I was in trouble when the customer's wife told me that every contractor who'd ever worked for them was dishonest or didn't do the work right. When it came time for payment, the customer refused. In fact, he presented me with a list of problems that he intended to have corrected by someone else. The cost would be deducted from my payment. When I offered to correct what he saw as problems, he refused since he didn't feel I could do the job right.

What can I do in the contract or in the way I handle customers so this won't happen again? I got a front end payment and progress payments, but I'm afraid I'll have to take him to court for the rest, something I'd like to avoid since I'm afraid of negative publicity.

Also, how can I know if a customer has stiffed other contractors? It seems this particular customer has been doing it for a long time. Can I report him to the Better Business Bureau? What if he's reported me? How could I contact the other contractors he's stiffed? Would we have a better chance of success if we all took him to court together?

Peter Vermouth
Springfield, Mass.

Kathryn Conklin responds:

When a customer asks for free extras, I recommend addressing the issue of expenses on the spot. Sometimes customers don't realize the time and effort it takes for add-ons. Some think the contractor can just include something else "while they're at it." Make it clear that you are willing to do extra work, but only after you've discussed whether the work will involve extra costs. If you decide to charge for the work, make the necessary revisions to the contract or

write a change order for the customer.

You might also consider writing a dispute resolution clause into your contract. You may, for instance, require third-party arbitration so that problems can be settled through mediation instead of in court. Frequently the customer will realize that his complaints will not hold up under a mediator's scrutiny. Also, it will avoid the time and effort, as well as the negative publicity, involved in going to court.

It would not help to report the customer to the Better Business Bureau (BBB) since the bureau tracks complaints against companies, not against their customers. However, if the customer complained to the BBB about your business, you would know it. Any company that is the subject of a complaint will receive a copy of the complaint and have an opportunity to respond to it.

Finally, the best way to find other contractors who may have had similar problems with the customer is to run a credit check on the customer. If this isn't possible, try checking around with the members of your local remodeling trade association.

Kathryn Conklin is director of bureau programs and standards for the Better Business Bureau, based in Arlington, Va.

Corrections

The article "Steel Stud Partitions" in the March 1991 issue incorrectly identified the meaning of screw specifications. We should have said that a screw labeled "8-18" is a #8 screw with 18 threads per inch.

The Editors

The Estimate Writer software mentioned in Computer Bytes (1/91) cannot be purchased separately for \$3. The software is only available to buyers of the 1991 National Construction Estimator reference book, which is published by Craftsman Book Company.

The Editors

For more information

New England Gypsum, mentioned in Eight-Penny News (2/91), can be contacted at PO Box 484, Montpelier, VT 05602; 802/223-2608.

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.