Letters

Lightning Striking Again

To the Editor:

In reference to Henry Spies "On The House," (1/89) I think that the metal turret should be grounded. Its position as the tallest thing around makes it a lightning rod without a downconductor. Of equal or greater importance is that the downconductor be well grounded. My understanding is that a ground rod driven into dry earth is not adequate; moist earth is required.

I am not an expert and became interested only after a 10-foot-high log shed surrounded by 30-foot-high trees was struck and ignited by lightning while my brother and I were inside. The fire was small and easily put out. How did it happen? The trees showed no damage and were not an isolated grove, but a part of the general forest. There was a 10x10 lean-to with an ungrounded metal roof attached to the log shed. We figured that the metal roof was a sufficient target to entice the lightning down through the trees, but what it really wanted was a ground and thus went to the greater mass of the log shed.

In Henry Spies' response, he says "present thinking is that conventional lightning rods may cause more lightning damage than they prevent." I would wonder how much of this is due to inadequate grounding. Could you provide me with references regarding problems with conventional lightning protection systems? I would like to know as much as I can before I proceed with my planned removal and reinstallation.

Steven K. Lotz
Tower, Minn.

Our May 1989 issue had a feature on lightning protection systems which would tend to support your theory. At the end of the article, you'll find a list of source books on lightning protection. —Editor

Rules of Thumb Not Enough

To the Editor:

In his article "Secrets of Structural Engineering," Harris Hyman strikes a wide balance between explaining the complexities of the formula for calculating beam dimensions (he never did get to the formula for girders), and offering an old rule of thumb in its place (one that unfortunately ignores all the variables of species and grade of lumber, live and dead loads, and on-center spacing of members).

Architectural Graphic Standards is an invaluable tool for every designer, builder, or remodeler, but for on-the-job use I need something a little handier than a massive reference book, a computer with screen graphics, or a complex seven-part formula. And something more accurate than a general rule of thumb.

Several years ago I produced a set of span table for joists and rafters than includes 66 species and grades of lumber at 16 inch on-center and 24 inch on-center under six different load and use conditions. These tables will tell you at a glance the maximum permissible span for each dimension of joist or rafter. It's fast, simple, and accurate. And more important, you'll get the same answer that your building inspector or code enforcement officer will be arriving at because these span tables coincide with code specifications for swelling construction under the major model codes (I.C.B.O., C.A.B.O., B.O.C.A., S.B.C.C.I.).

The span tables are in *Pocket Size Carpenter's Helper* available from R.S. Wood & Co., Liberty, Maine. If *anyone* has a faster, easier, more accurate method than using the *Carpenter's Helper*, I'd like to hear about it.

Robert F. Bailey
Liberty, Maine

Editor's note: *Robert Bailey is the author of the book Carpenter's Helper.*

Under-Roof Moisture Problem Solvable

To the Editor:

Concerning Al Wasco's letter in the November '88 issue, I have found that under-roof cavities filled with insulation will shorten the life of asphalt shingles by several years. Recently, I worked on a home that had a 10x10-foot cathedral ceiling area. The 3-1/2-inch fiberglass insulation in a 2x6 rafter cavity blocked venting of the sun's heat; the asphalt shingles never dried, and this caused disintegration of the shingle materials. These shingles had to be replaced in a relatively short time. The rest of the roof didn't have cathedral ceilings and had unrestricted venting. That section of roof appears to have several years of life left.

C. Burgess
Wappingers Falls, N.Y.

Surveying Savvy

To the Editor:

Mr. Richard Cooper's article "Starting out Square and Level" (*The Journal*, (3/89) is generally well-written and pertinent, but it contains several points that I feel need clarification.

Mr. Cooper is quite correct when he says the "bench mark" method is superior to the "vertical rise" method when shooting a grade. But there appears to be a typo there, where 89 feet 2 inches minus 88 feet 4 inches equals 10 feet 0 inches!

In the absence of any given bench mark elevation on a plan, it is common practice to "assume" any convenient and pertinent point as 100 feet 0 inches, or 100.0 feet, and work up and down from that.

Which leads me to one of the main points of contention. I do not agree with his comments about survey rods. Commonly the rods are marked in feet, tenths, and hundredths of a foot. Rods are also available (usually by special order only) in feet, inches, and fractions, (1/8ths); but these are not nearly as common, or as popular, because once you are used to using them, decimals are much easier to read and figure with, than are inches and fractions.

But I have never seen or heard of a rod marked in "10ths of an inch" as he alleges. Checking with the big city survey supply houses reveals that there is, simply, no such animal.

A very handy tool for the grade-shooter's hip pocket is a 6-foot folding rule marked in feet, inches, and fractions on one side, and feet, tenths, and hundredths on the other. (You can obtain one at a drafting or survey supply store.) To transpose instantly from one systems to the other, simply place your thumbnail on the edge and flip the rule over. This tool is also quite handy for shooting grades, as the survey rod can sometimes be too heavy, clumsy, or awkward for some types of grade shots.

Another handy idea is that 1/100th, (or.01) of a foot is equal to 1/8 inch, for all practical purposes. (96 1/8th-inch marks to the foot, versus 100 marks in decimals). So the "footimals," or "inchtrics" problem is really not a problem, with a little study.

Next, I can't imagine a discussion on grade shooting that makes no mention of "height of instrument," or H.I. This is the shooter's first task after setting up the instrument" establish H.I. This is done by taking a rod reading on any bench-mark. In Cooper's example, 110 feet 0 inches, (+ 3 feet 6 inches) the H.I. is thus 103 feet 6 inches. Or as I prefer, 103.5 H.I. – 89.17 T.O.F. = 14.33.

This is the technique that is used and recommended by all the surveyors who run line and grade for a living. Any other method is far more prone to confusion and mistakes; and in construction, whether housing or commercial work, union job or not, mistakes are a no-no.

Regarding Cooper's diagonal check: It should be strongly emphasized that *all four* sides of the square or rectangle should be checked *first*. If any side is off dimension ("cut a foot"), the diagonal will simply split the error in half; and you can be radically out of square while showing a perfect diagonal check. For this reason (and others), any good boss will issue these order to his crew:

"Do *not* 'cut a foot,' anywhere. Ever. Tie a piece of nylon line through the hook end of your 100'foot tape, and you can hold it to zero-zero against a pull."

Lastly, the common worry (and arguments) about whether or not an instrument is shooting accurately can easily be solved by doing a "peg test." (See any good survey book.) This test is simple to do in the field, and takes two men about 15 to 20 minutes. Any instrument with good optics can easily be adjusted (and the rod read) to an accuracy of .01 foot (1/8 inch) in 200 feet. Then you can set it up any place you like, and shoot level as far as you want.

San Hill
Pt. Townsend, Wash.

Missing Address: *A number of people have contacted us to get the address of the foundation retrofit company featured in the* The Journal's, *3/89 article "Foundation Catastrophes: Causes & Cures." The company, On the Level, can be reached at 80 Enterprise Rd., Hyannis, MA 02601.*