

TIMBER FRAME ENGINEERING COUNCIL

Expanding horizons at the timber grading course

MIKE WESTGARD

When class started at 8 a.m. on October 24, you could immediately tell that the seating was designed by engineers. You know it's snug when the engineers start the class by saying, "I know it feels a bit cramped, but you'll feel more comfortable after you are seated for a while." Well, the engineers were right, it went from feeling tight to cozy within the hour.

We started with an exercise led by Ron Anthony to introduce ourselves to our neighbors, and after a few minutes, we began our session with a confession to Dick Schmidt that nobody had read the entire folder of course materials and a story from Ron to illustrate the challenges presented by clients with specific requirements.

Ron taught us the characteristics of wood all the way down to the cellular level but in a way that made it possible to get it—even if you didn't show up to class with a PhD. To learn exactly how wood reacts to stresses like load, moisture, and mechanics of failure is truly a game changer in how I perceive the structure that protects me. I think I assumed I knew what the wood was doing. After this training I am so much more aware of how the wood behaves and reacts and how to read the characteristics of a timber, and I will not default to calling characteristics defects.

Rick Hicks, from the Western Wood Products Association, went into the rules of grading and related theory. It is easy to get confused, but the grading rules made it clear with all the supporting documents and supplements outlining exclusions and interpretations. Rules are tricky and sometimes we need to consider the underlying premise for the rule.

As day two began, we all had some level of understanding, but were also confused for one reason or another. This is the where the learning process begins: if you're not struggling, you're not learning. We began working our way through visual grading, the first assessment in grading timber.

With visual characteristics like split or slope of grain you can downgrade a timber, which changes the tolerances of other features. Seeing a split or ring shake or rot can send you on quickly to the next piece until you learn more and find out that most characteristics in a timber are expected and what might look like a defect is actually a characteristic of the timber and any given characteristic has a measurable tolerance to determine grade.

This is important because you can assess in real time if a timber has changed since its green grading and no longer makes the grade needed for the design values assigned. The ability to observe and measure timber grade is also vital when you need to replace a timber:

instead of having to purchase a new timber, increasing cost and resulting in time delays, you can review your own inventory and utilize a piece that would otherwise be downgraded.



Rick Hicks, WWPA inspector (second from left) discusses knot-measurement diagrams with Don Davis (left), Bert Soyka (right), and Lance Slyman (second from right).

In short, you have a superpower now: you can make grade adjustments based on the rules and measurables. Cutting off a split that caused downgrade, measure the characteristics, finding the hidden value will make your project stay on timeline and budget. Something as simple as identifying the exact species can give you the ability to increase allowable design limits because the grading rules are based on groupings of similar trees.

We continued learning the mechanics of wood and dove into the in-situ grading training. The grading of timber in a building is much more difficult for a variety of reasons, including mechanical systems blocking access, painted timbers hiding visual defects, and the fact that you typically cannot see all six sides of the timber. Ron taught us some basic processes to avoid spending time doing tedious calculations as well as some common sense assessment tactics. For example, when assessing failure in a building one should look at what is working and then look at the failure—there simply could be one low grade stick which would not be an indicator of the whole structure.

Rick then took us through the WWPA's little brown book of grading rules again and in further detail, just to be sure we were completely confused before we went out and started practicing on actual timbers with our own books in hand. With a head full of information, we broke up into groups and started using the rules, exceptions, and observable mechanics to make assessments.

Rick, Ron, and Dick moved from group to group to work with us. I found this part of the teaching the



The group takes a break during its tour of the yard at Rocky Mountain Joinery Center.

most inspiring: they worked and struggled with us rather than just giving us the answers, they joined the confusion almost as if they were learning too. They were good teachers and let us work out our problems, only giving input when we were completely stuck. Together we began to share with our colleagues the parts we understood and listened intently to those who understood what we did not. We even shared some laughs. At one point our group was working some math and I came to five divided by eight in part of the equation, I typed it into my calculator and announced it was .625. Rick inquired what that was in inches, I converted and exclaimed $5/8$ ". We both pondered and thought wow, how unusual, five divided by eight equals five-eighths. It was worth the laughs it brought.

With some new hands-on skills and some experience using the rule books and technical bulletins we ended the second day, many of us feeling that the lightbulb was there, but maybe only running on 3 watts. Testing loomed on the final day, and our brains were beyond capacity, so we retired for the evening to gather for dinner.

The last day began like the ones before, with Ron explaining wood mechanics and the techniques to make sound judgments as well as how to communicate with engineers, building officials, and clients about the strength and longevity of wood as a building material.

With a sound technical argument, a certificate from this course, and perhaps some name-dropping, we could now assess, grade, and communicate the results. We took our written test, and reviewed and discussed the results before moving on to the live test.

Sticking to our groups we went through four testing stations, and there was a lot discussion, but this time everybody was coming to the same conclusion and agreeing on specific conditions, verifying them with rulebooks in hand. Of course, our instructors didn't make it easy on us. Most of the pieces had some objectionable

elements we were suspicious of the samples that were simple to grade. This part of the testing was invaluable; our conclusions were strictly our own and we gained confidence from identifying and proving grade along with limiting factors.

Coming in, I only had intuition from my experience in the industry; as a result of this course I now have a process for coming to conclusion as well as the ability to identify resources to prove my conclusion. And though I did not take the grading course for my job, I've already had the opportunity to use it, and on my first day back to work after the class. I was able to identify the in-situ characteristics of a timber and assess the allowable design limits and convey that information to the structural engineer working on a project.

Every time I attend a Guild workshop, I come away with a clearer picture of the building processes, the building sciences, and the confidence to communicate about our industry with the hopes of influencing others in best practices. Above all else I take away a rejuvenation of spirit and deeper love of the wood with which we work. With new knowledge, new friendships, and new tools, I've gone back to the day-to-day refreshed from timber friend therapy. I cannot begin to express my thanks to our instructors, the Guild, and all the members who keep these amazing workshops available to everyone, experienced or not.



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