

ENGINEERING DOESN'T COST — IT PAYS!

Certified design adds value to post-frame projects

In the post-frame industry it is widely held that engaging the services of an engineering consultant is a big expense that should be avoided if at all possible. After all it is an additional expense that will reduce the bottom line. Most post-frame buildings are pre-engineered, sort of, and most quality builders are well experienced and are more than capable of dealing with the wrinkles that surface from time to time. It is relatively easy to obtain engineering back-up to trusses, laminated columns, I joists, metal roofing and similar items from the manufacturers and suppliers of these primary components.

Load tables for wood beams, joists, purlins, etc are widely available and for those items not available in tabular form, software programs abound. With all of these resources, the builder just needs to put together the various pieces to get a design that is just as good as the one they would commission an engineer to develop.

This is far from the truth. All too frequently, the engineer is called in to bail out the contractor or remediate a project already gone south. So instead of being allowed to be pro-active we engineers end up being called upon to diffuse a

problem and keep it from getting worse. But, with a bit of forward thinking and planning, this scenario can be avoided altogether and the design expense actually pays dividends.

While tables, charts and software programs are a great guide, they cannot replace a talented design professional and frequently do not yield the most cost effective and efficient designs. When the design and engineering community is commissioned to develop these helps, they will be conservative, they will reflect worst case scenarios and they will be safe.

For example, IBC Table 2308.8(2) Floor Joist Spans for Common Lumber Species is a table provided by the lumber industry frequently used by builders for the design of residential and commercial floors. This table is developed to reflect both strength and deflection.

In most cases, the deflection limitation of $l/360$ (the joist span divided by 360) governs. The table also reflects both a 10 PSF and 20 PSF dead load allowance and considers that the joist is a simple span joist (supported at each end with no intermediate supports).

Table 2308.8(2) is a great design tool whenever all of the considerations and

criteria are correct. But when this is not the case, there exists an excellent opportunity to value engineer and develop a more economical design. The deflection limitation is conservative so that if a plaster ceiling is installed under full load it won't crack. The 10 PSF dead load is greater than normally found in the field. The table doesn't account for an intermediate support or supports and gives no guidance when MSR lumber is used. A few minutes of engineering time just might yield a significant cost reduction.

Another frequent area of opportunity is for connections, additions and other non-standard post-frame applications. Understanding that there are a greater number of unknowns for these projects, most builders will simply add a bigger contingency or utilize construction techniques used previously and hope for the best. Your consultant, however, will evaluate the specific case, and usually provide multiple options. He or she will develop a design that eliminates most of the unknowns and reduces builder risk.

In order to get the desired results, good communication and a clear understanding between the builder, engineer and

owner as to expectations and limitations of each option is imperative. Failure to do this may undermine and negate any opportunity to value engineer the project.

Whenever a builder or owner gives the designer a specific direction and instruction on what is wanted and how they want it accomplished, you substantially limit the creativity of the engineer and the flexibility of what can be designed. When the question is asked "can it be done this way" the answer frequently will be "yes" even though it is not the most efficient way to solve the problem. My advice is, whenever possible, give broad latitude and encourage creative options. Encourage the engineer to provide a design that solves and addresses the issue and ask for multiple options. You will be most pleased with the results.

Arguably, a certified design adds value to your project as well as piece of mind. When something is truly important, we tend to take reasonable measures to lessen our exposure to potential risks. Most willingly, pay an attorney to draft a will even though TV ads suggest and encourage us to do it on our own and save unnecessary expense. Contractors and business owners, for peace of mind, pay a premium to have their taxes prepared by a CPA. So, if the builders' risk management strategy includes prudent utilization of attorneys and accountants, why shouldn't it also include judicious use of engineering consultants?

Today's business climate differs considerably from that of 10-15 years ago. As a society, we feel compelled to hold someone accountable for anything that goes awry. Also, most of our business clients, successful farm operators and well funded private customers are on a first name basis with an attorney. My experience has been, when issues arise and questions about design and construction practices surface, nothing is as valuable as engineering documentation and verification to divert focus to less risky areas. The same applies to building code and building inspection issues.

Let's not lose sight of the fact that if you are planning for a 5 percent profit, every \$1,000 of unplanned expense requires \$20,000 in new business or \$1 million of new business for an unplanned \$50,000

expense. Additionally, most clients place considerable value in possessing a set of certified drawings. This even applies to projects exempt from any statute, rule or regulation but are provided just because it's the right thing to do.

From my biased perspective, a post-frame builder, who wisely and judicious-

ly uses his engineering resource, will find at the end of the day, it to be a win-win scenario. It stands not only to increase your profit, but will enhance client relations, lessen legal exposure and truly set you apart from the field. **FBN**

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