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Quality Control in Manufacturing & the Third Party Auditing Process by Stan Sias

The November issue of Structural Building Components was dedicated to quality. There were articles on quality from the Truss Design Engineer's perspective, the Component Manufacturer's perspective, the need for Quality Control (QC) Standards in general and the history behind the needs. Several references were made to the overall scope of QC in the manufacturing process and the code required third-party auditing. While there is an ongoing effort to harmonize the actual in-plant inspection procedure with that of the independent inspection agency, one must remember the fundamental differences between an on-going quality assurance program within the manufacturing realm and the benefits of monthly and/or quarterly auditing of that process. Basically, one does not work well without the other.

What exactly does quality control within the manufacturing realm mean, and how does that affect the finished goods that will ultimately be audited by the independent inspection agency? To me, quality control in manufacturing is a cultural understanding within every part of the manufacturing company. Notice I said company, not plant. QC needs to start at the very beginning, it needs to be the very thread that binds the manual of the corporate culture.

Quality Control in Manufacturing (QCM) starts with the sale. (Yes, sale; for without sales we all know we need much less manufacturing.) What is the quality of your sales? Do you know for sure, exactly what your customer is expecting, and vice versa? Is it defined in an enforceable contract? Is your risk being managed in a manner that you are properly insured and being appropriately compensated?

QCM must be a major cultural component within the design segment of your business. Your sales people may want the lowest price whereas your customer really wants lowest in-place cost. Is everyone on the same page? Web and chord length optimization may save you a nickel but cause for additional bracing that cost your customer both time and money to install. Where's the benefit? Where's the quality in design? Do all the designs meet all the current standards? Have all loads been properly accounted for? Are you sure? Today's software packages are truly marvelous tools but are they perfect? Another quality check.

QCM is of utmost importance in your lumber procurement. Does your current supplier consistently exceed your expectations? Do you have good control on culls, moisture content, and mold? Can anyone truly say that they think QCM doesn't apply here? Jim Thomas of Trussway, in his recent BCMC presentation on Production Efficiencies, tied the lack of culls, to the need for re-cuts, to safety on the shop floor to table efficiency. Lumber quality does matter; price is no more the only factor in lumber procurement than it is with your customers procuring components. Quality doesn't just happen, it's built in!

The in-plant quality assurance program may be the easiest of all QCM to implement. Most

assuredly, the In-Plant WTCA QC program has proven time and again to more than pay for itself when fully implemented. The training and educational value of the process alone has drawn rave reviews from participants all over the country. What exactly are we looking for in an in-plant quality control process? Ultimately, we're looking for trusses that can withstand the rigors of the fast-paced manufacturing environment, and still consistently stand up to the specifications to which they were designed. There are eight pages in Chapter 3 of the ANSI/TPI 1-2002, National Design Standard for Metal Plate Connected Wood Truss Construction. Eight pages of Quality Standards.

What do we look for in an in-plant quality control process? We look for ways for the component manufacturer to control their manufacturing processes and to make the necessary adjustments to ensure the finished product consistently meets the industry quality standard. This means that the in-plant process must be a system that is as objective as possible, to eliminate guesswork on the part of the inspectors and the plant fabrication personnel, and to avoid variation in table to table or plant to plant evaluations. We are looking for a process that provides quantifiable quality measuring units so that any two inspectors will come back with nearly identical results. Further, we are looking for a means of inspection data collection and retrieval that will allow management to assess trends, spot potential problems and take immediate action based on that solid data.

As stated above the changes in the new quality standard were explained in great detail in November's SBC. In that issue, TPI's Technical Director, Kelly Gutting states; "Finally, and perhaps most importantly, another significant change is that the extra tolerances for the structural quality of truss joints are considered during the truss design process, and the truss manufacturer can affect how much tolerance is built into the design. The truss manufacturer gets to choose the level of built-in quality tolerance based on their manufacturing practices, quality assurance needs, and demonstrated conformance with minimum quality standards." Managed needs, another step in the quality process.

So, back to the question of what are we really looking for in Quality Control in Manufacturing. We want a total, managed, and quantifiably measured, data collection and retrieval system that will assure consistent finished goods quality, day-in and day-out. Why then do we need independent third-party auditing?

Let's look at the Commentary to Chapter 3 of ANSI/TPI 1-2002 for that answer.

§3.1.3—An effective quality control procedure is a continuous process, and the satisfactory manufacture of metal plate connected wood trusses can only be assured through: (a) proper quality control of materials and of the manufacturing process; and (b) frequent visual inspection of the manufactured product.

Thus, continuous documentation of some form of in-house product control procedure is critical to maintaining quality in the manufacturing process, and this requirement has been a part of the quality criteria since the QST-86 edition of the quality criteria. The method of documentation is up to the Truss Manufacturer....

This is why the WTCA Quality Control committee has worked so hard on developing the WTCA QC program. It is a computer-based method of documentation whose intent it is to make the QC process simple and create a great management information system.

The most effective way to confirm that a Truss Manufacturer's quality assurance procedure is being used properly and is adequate in its purpose of achieving an acceptable level of quality is through an audit of the manufacturer's documentation showing the actual application of the plant's procedures. Thus, the effectiveness of a periodic inspection by a third-party inspection agency, as may be required in some areas by the local jurisdiction, requires review of a Truss Manufacturer's in-house quality control documentation in addition to the optional supplemental inspections of some additional trusses. Where periodic inspection by an approved third-party agency is not a requirement of the local jurisdiction, a Truss Manufacturer may still take part in a voluntary third-party quality assurance inspection program, or it may find some other means to audit its methods for ensured compliance with the quality standard.

Just as our company financial records are internally audited and then periodically externally audited, our in-plant process must undergo the same scrutiny. The third-party inspection is more a verification of the process than an inspection of the product, and as such, the monthly and/or quarterly inspection will never, and must never be looked upon as THE ONLY QC program for your manufacturing operation.

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