

STRUCTURAL BUILDING COMPONENTS MAGAZINE (FORMERLY WOODWORDS)

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Current Status of QC Testing" by Kirk Grundahl & Ryan J. Dexter

At WTCA's Open Quarterly Meetings in May of 2000, the Board of Directors authorized spending a reserve savings amount of \$50,000 to undertake testing to determine the correlation between truss industry quality assurance procedures and how well the finished truss performs in carrying its designated loads. Since work was already underway in a separate and related project through Professor Steve Cramer in the Department of Civil Engineering at the University of Wisconsin—Madison, WTCA decided to undertake this work there to gain the synergistic benefits of all the research work being done on behalf of the truss industry.

In July, Trussway, Ltd., of Houston, TX, hosted WTCA's Quality Control (QC) testing efforts. Thirty trusses were manufactured and QC was completed on all joints, front and back. After all the QC data was collected, the trusses were fully loaded in a test rack and tested to destruction.

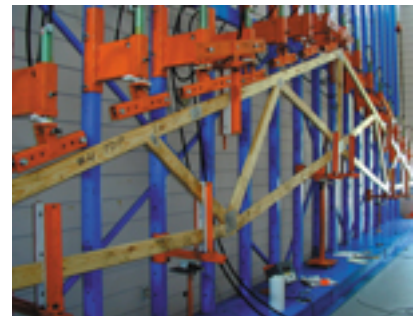
Professor Steve Cramer and graduate student Bert Hall provided a report on their progress to WTCA a few weeks ago. The following is a summary of what we have learned through this testing, now that more data has been analyzed, and our next plans of action:

- It seems very promising that there is a relationship between data points that we did not expect to find. This relationship deals with plate Combined Stress Indexes (CSIs) and plate placement, and the possibility to use *WTCA QC* data to arrive at a simplified QC approach. Due to the highly variable nature of wood, it is not often in lumber research that strong, well-defined relationships surface. This finding has surprised us and we are still scrutinizing it.
- Those from TPI who are participating in this process (Dave Brakeman of Alpine Engineering, TPI TAC Chair and Steve Cabler of MiTek, designer of the trusses that were tested) agreed that the plate CSI information that would be required in this process can easily be obtained from the

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Bert Hall, UW Graduate Student, performing QC on one of the many joints.



Test rack used to conduct tests - courtesy of Trussway, Ltd.



Shear failure at a heel joint on one of the tested trusses after loading.



Plate withdrawal at a heel

truss design software and could be included in the truss design if it helps the QC process.

- We will develop a model using this test data and determine the most cost effective QC inspection parameters and approach to QC in a truss plant.
- Once we test and use the model to create the QC parameters that best assess truss quality, we will develop a testing program to evaluate the newly created inspection parameters to ensure we can define true quality performance of real trusses.

joint on one of the tested trusses after loading.

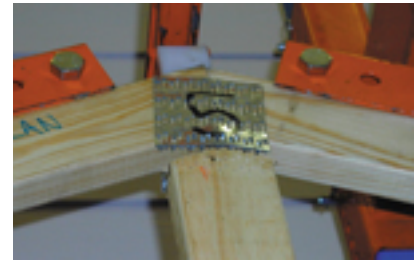


Plate withdrawal at a peak joint on one of the tested trusses after loading.

As we have said in the past, the current goals of this testing program are:

- Learn if it is possible to narrow the focus for QC based on the likely consequences of QC defects at a joint. (It looks like this is achievable. Now we are working on the specifics.)
- Develop a quick and simple QC evaluation that can be easily implemented by the typical component manufacturer in our industry. (It looks like this is achievable. Now we are working on the specifics.)
- Determine from the data the key QC evaluation that needs to be done on the critical joint(s) and the subjective evaluation that can be done on the remaining joints. (Our data suggests that there may be an even better approach to this problem. We will be working on this diligently.)
- Determine incentives to enhance the use of good QC methods. (This is still possible but can only be considered downstream.)
- Discuss the feasibility of implementing a QC feedback loop for truss designers to aid in their assurance that the manufactured product meets the quality expectations of their design. (This is very possible.)

An important WTCA mission is to support research, development and testing of trusses that ensure a sound engineering basis for our industry and improve the quality and efficiency of our products, for the purpose of obtaining greater product acceptance. At our Open Quarterly Meetings in May, the Board of Directors took a step forward that is certain to be viewed as pivotal to the future of our industry for years to come.

For more information on the recent QC testing and the *WTCA QC* program in general, contact WTCA at 608/274-4849.

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