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Knowledge is Power

"Costing and Profitability of a Truss Plant" by Kirk Grundahl

When you take a look at truss manufacturing, the obvious key cost elements that define the business equation are:

- Lumber is about 50 percent of net sales.
- Plates are about 5 percent of net sales.
- Direct production labor costs are about 20 percent of net sales.
- Delivery labor is about 3 percent of net sales.
- Delivery expenses are about 3 percent of net sales.
- Selling expenses are about 3.5 percent of net sales.
- Administrative labor is about 4.5 percent of net sales.
- Engineering expenses are about 4 percent of net sales.

The total labor portion of the truss cost structure is about 35 percent of the cost of the product, and obviously the largest portion of this is production labor. Its clear that the only real places where there are significant cost saving possibilities are in labor and lumber use. This means that an efficient truss manufacturing operation will do the following:

- Look closely at its lumber purchasing strategy.
- Implement policies that fully use every stick of lumber it purchases.
- Simplify the flow of material through the plant so that labor time in each phase of plant operations is optimized.

Given these parameters, let's take a walk through the current truss plant, reflect on these key aspects of plant operations and ask some questions that may guide us as we think about our industry's future.

COST OF LUMBER

It should be clear why many truss plant owners pride themselves in being the best lumber buyers in the world. As lumber is the most significant cost in a truss plant, the lower the lumber cost, the greater the profit margins a company can achieve. Also, if you buy right in a fluctuating lumber market and have the ability to pass on cost increases to builders, profits can strengthen dramatically. Clearly, truss manufacturers who consistently buy lumber at the lowest price in their markets have a significant cost advantage and the greatest truss pricing flexibility. Beyond buying low, collecting early and paying late, what else should a truss manufacturer consider?

- What purchasing strategies have you implemented to make your profit margins reliable?
- What kind of arrangements or alliances have you made with your lumber suppliers to control lumber cost so you can accurately and reliably price your product at a consistent profit? Or, if you believe that the market won't let you price where you need to be, do you at least know how much money you are losing on each job you ship out the door?
- Is it best to buy random lengths or standard lengths?
- Which standard lengths produce the least waste?
- What is the cost premium for buying standard lengths versus random lengths?
- Through the incoming shipping and storage process, how much of a bunk of lumber is damaged or wasted?
- Do you track the damage you get from each lumber supplier or mill you buy from? Do you know the amounts and the reasons for all the product you cannot use as it is shipped to you? Are you using a system like ***WTCA QC***™ to help you track this information? What are the causes of the waste?
- Do you track the cull rates due to warp, twist, crook, wane and mold by lumber supplier or mill you purchase from? Are you willing to return lumber or change lumber suppliers or mills if you find you are culling too much material?
- What changes can be made to the process to reduce waste?
- How much of a bunk of lumber can be used?
- What is done with the lumber that is culled from a bunk? How much of it can be used in other parts of a truss?
- What is the total added cost to each truss you produce due to your cull rate?
- Are you willing to pay more for your lumber to get higher quality and less cull?
- What is the cost of the cull rate as opposed to the cost of buying a better quality stick of lumber and culling less?
- Is it worth using larger plates so that the quality of the lumber you buy does not affect the quality or performance of the truss you produce?
- Given that truss plates are only 5 percent of the cost of truss, would it be more cost effective to use larger plate sizes to cover over many of the lumber characteristics that negatively impact truss quality?
- In economic terms, how much of a dollar amount increase is there in the cost of the truss due to using higher grades of lumber in locations that could use a lower grade?
- What is the moisture content of incoming lumber? How does this affect your costs if you have to cull lumber after it twists and warps during the air drying process in your plant?
- Do you track moisture content and cull rate to see if moisture content is a problem?
- Does your truss designer up-size your plates to account for high moisture contents? What is the additional cost for each truss?

TRUSS DESIGN AND LUMBER/INVENTORY CONSIDERATIONS

There isn't a more important operation in a truss plant than the "truss technician" department. The decisions that are made can easily either save or cost a truss company thousands of dollars. Creating truss designs that completely optimize the use of lumber will have a positive impact on profitability, and the companies that figure out how to do this, while still performing truss designs efficiently, will be more profitable than their competition. Some additional considerations:

- Do you know the species, grade, size, and lengths that would fit the majority of your lumber needs?
- Have you set up your purchasing patterns based on your purchase history?
- Has your truss designer or lumber supplier analyzed the optimal lumber use with respect to your plant from a truss design perspective? Is your purchasing strategy based on this optimal lumber use analysis?
- What is the added cost of the truss when you use lumber that is in inventory versus lumber that would optimize the use of its design properties?
- On the flip side, what is the added cost to the truss for stocking enough lumber grades and sizes to optimize the use of the lumber design properties?
- What is the perfect balance between inventory and lumber design properties for the lowest-cost truss? This analysis may also find that the lengths you are buying are not optimal and this may change the way you purchase lumber to minimize waste.

INVENTORY CONSIDERATIONS

- How is lumber handled when it comes into the plant? How much damage happens in this handling process? How can this be reduced?
- How is the lumber stored? Does any damage occur in storage?
- How is the yard organized? Is it easy for the people feeding the saws to find the material and easily get it to the saws?
- How much lumber is damaged in the handling process at the plant? How can this be reduced?
- How is the lumber stored in the yard? Does the storage system you use make it easy for the yard personnel to find the lumber they need?
- How efficiently does lumber flow from the inventory stacks to the saws?
- What is the number of inventory turns for each item, and what is the carrying cost of inventory for each?
- Why do the slow movers move slowly, and can they be eliminated?

The goal with all of these questions concerning lumber costs is to minimize waste and maximize profits. As the market often controls the price you can obtain for your product, your profits are totally dependent on the costing side of your business. Hence, this analysis becomes your profit lifeblood. If you happen to be really skilled, you will get a higher price than others in your market, and have lower lumber costs due to good analysis, and will be recognized for the great profit you generate.

MATERIAL FLOW THROUGH THE TRUSS PLANT

The second major cost consideration is the labor factor. Any time not spent adding value to a piece of wood or a truss plate is time wasted and, as such, is an additional cost that needs to be added to the cost of a truss. Given this, the following questions are important:

- How long does it take to get lumber to the saws?
- How many times is the same stick of lumber handled before it is at the saw and cut?
- What is the cost of the person delivering the lumber to the saw
- What is the cost of the person sawing the lumber?

- How many times is lumber handled after it is cut?
- What is the cost of the person taking the lumber from the saw?
- How smooth is the transition from sawing to the manufacturing area?
- How many times is the lumber handled during the transition from sawing to truss manufacturing?
- What is the cost of the people involved in this transition process?
- How much dead time is there for these people? What is this cost?
- How easy is it to get the lumber to the manufacturing area? How many people does this take?
- How many times is the lumber handled in this process?
- How far do they have to walk to get the lumber to the table? How many trips do they make?
- How easy is it to get the truss plates needed to produce the truss? How many people does it take to do this? How far do they have to walk to get the plates?

TRUSS MANUFACTURING

Our industry often focuses on the actual manufacturing process and the speed with which we can produce a truss. Obviously, the faster the equipment, the faster a single truss can be produced. But there are questions here as well.

How much dead time is there when a individual in the manufacturing area is standing and doing nothing waiting for the truss to be pressed, waiting on lumber, waiting on plates, waiting on the finish roller, waiting on stacking, etc.?

Is it possible to create a work environment where there is always some action taking place that adds value to the wood or the lumber? What changes can be made in the operation to do this?

TRUSS STACKING AND STORAGE

This is usually a critical area of truss production, as it is the final check on the quality of the product. Any bottlenecks will cause all the steps of production in front of it to slow down, wasting time.

- How many people are working in this area of production? Is automatic stacking used? Would that help reduce the number of people needed in this area?
- How many times does a problem cause the entire production line to stop? How long are these work stoppages, and how does that time translate into dollars when considering labor costs?
- How often does the stacking process stop due to a quality problem?
- How often are manufacturing errors not caught here that have to be corrected after the trusses get to the field? What is this cost?
- Does this area use your most experienced or least experienced person?
- How often are trusses damaged in stacking?
- How often are trusses damaged in banding?
- How often are trusses damaged in the lifting and storage process?
- When stored, are trusses easy to find?
- How easy is it to load trusses onto a truck for shipping?
- How much dead time is there in this process? Are there other activities that could be done to

add value to the truss with this dead time?

These are the first of many such questions that can be asked to aid in determining where lumber and labor affects profit. We would be interested in any additional questions that our members have found useful in improving operations, or other unexpected areas that generated profit improvements.

WTCA created ***WTCA QC*** to assist in answering some of these questions. The goal is to provide a tool to document and chart the answers so that better lumber and manufacturing decisions can be made. We expect this program to evolve into an even better management tool as implementation of ***WTCA QC*** increases through the country over the next several years. (More information on the ***WTCA QC*** program may be found on the WTCA web site www.woodtruss.com.)

The key issue is really the time it takes to get the answers-do you have the time? Maybe a better question is: How can you afford not to take the time to incrementally improve these two important phases of your business? Today, incremental improvements may be the only difference between being competitive or noncompetitive.

Truss Plant 2020

A "Jetsons" view of the truss plant of the future:

The building plans come in over the Internet and are automatically uploaded to a component design program. The design program creates all the component elements to be manufactured, automatically optimizing each based on the existing inventory of materials in the plant.

Once the component design is complete, it is collated with all other component designs in the manufacturing system and all are sorted by due date. This data is sent to the plant where the following happens:

- Lumber is automatically picked out of inventory, put on a conveyor and sent to the saws.
- The sawing process is organized so that all trusses of the same type are manufactured at the same time.
- Each cut piece is sent from the saw to a manufacturing magazine.
- This magazine places lumber in a manufacturing jig in the proper location and another magazine places the truss plates and presses them. This entire process is no longer a horizontal manufacturing process but a vertical one.
- Once the truss has had the plates pre-pressed, it is placed onto a horizontal conveyor and put through a finish roller to firmly set all the plates.
- At this point, all the tags are automatically applied to the member from above.
- The truss moves to an automatic stacker that stacks in the order that the customer wants to get the trusses.

- A banding machine bands the trusses together.
- A crane picks the trusses up and delivers them to the storage area.
- The same crane is used when the trusses are ready to ship to the customer.

Because one of the key issues facing our industry over the next several years, or maybe forever, is availability of qualified labor that wants to work in a truss plant, how many people are required in this futuristic truss plant? With increasing sophistication of computer controllers, how many people does the futuristic truss plant really need to make all the components that our customers need us to make?

SBC HOME PAGE

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