From the Inside Out:

Evaluate Internal Material Flow with Site Plan

by Keith Hershey, Will Warlick & Libby Maurer

"How do I fit that new high capacity saw in my plant to optimize material flow?"

It's taken many years to configure your operation in the correct way and train your workforce to appreciate material flow efficiency. What often rocks your world of material flow perfection is a brand new, fully automated machine—the final solution to your production puzzle. For instance, you may find that the new computerized saw can save time cutting pieces, but you aren't rolling trusses out the door any faster. Before you take that step, take the time to reassess your material flow.

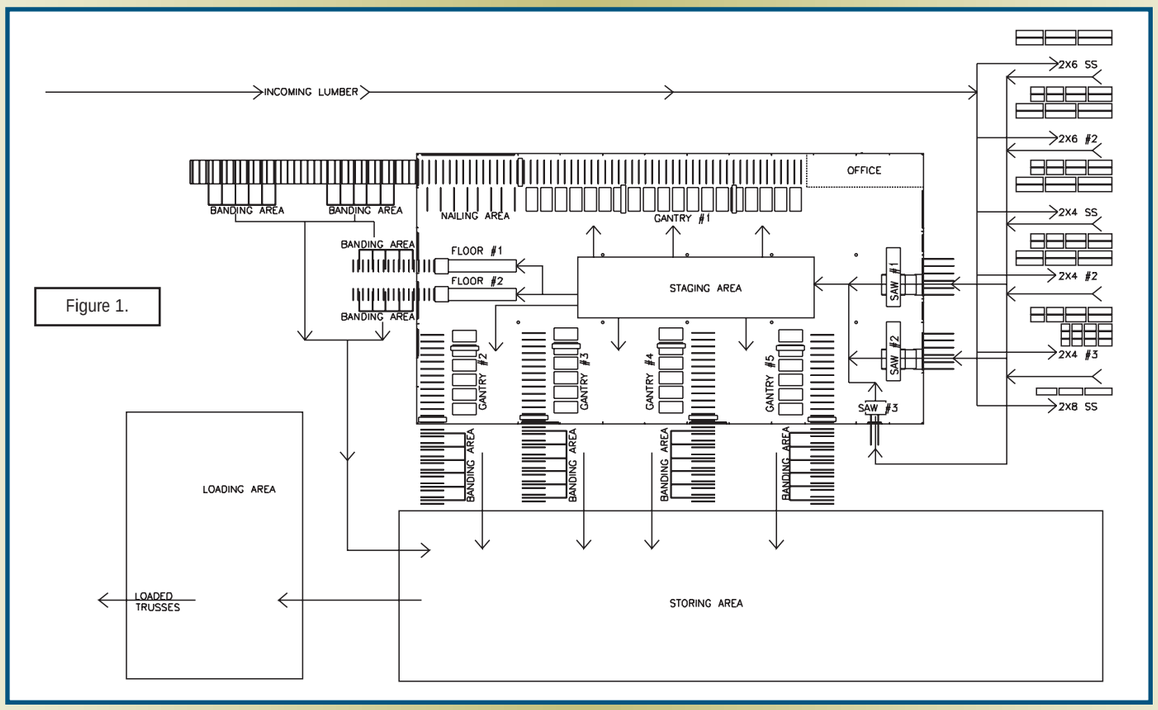

Figure 1.

at a glance

- Material flow is the path and process that material and paperwork travel through your operations in order to produce a finished product.
- You may find that the new computerized saw can save time cutting pieces, but you aren't rolling trusses out the door any faster.
- Your next challenge is to put them into action by documenting your operation's material flow.

What Is Material Flow?

Material flow is the path and process that materials and paperwork travel through your operations in order to produce a finished product. This may come as a surprise to those of you who think of material handling as an activity that only takes place in the shop. It encompasses more than you might think. Material flow starts from the point at which a job comes to the plant for order entry and ends when it leaves the yard for delivery to the jobsite. But how do you make sure material flow in the most direct route and as quickly as possible? In production, material flow starts with where and how raw materials are stored and then how they get delivered to the saws. Next it continues to the cutting stations, to the production tables, the final roller and truss storage area. The way you prepare the design, how you handle the paperwork involved, and the inventory with which you design are just as important. Ideally, each element of this process will have a limited number of stops and each item will touch as few hands as possible.

remember:

Material flow encompasses more than just manufacturing the product.

Those are the fundamental concepts; your next challenge is to put them into action by documenting your operation's material flow. Experienced component plant managers say it's a good idea to take the time to draw your plant's site plan and to carefully trace the current flow of materials. This drawing can be used in multiple ways by looking at a plan view of your facility. Take the time to draw the path that your material follows from the point it enters the facility to the time it leaves as a finished product. Also note the size and volume of the product that is moving through your operation. Not only will this drawing allow you to analyze your current situation, but it will also come in handy when preparing for new equipment (i.e., that new computerized saw or enhanced production table you've been eyeing). Here are some areas you'll want to consider when evaluating your site plan: (see Figure 1)

- Straight line material flow
- Distances between operations
- Dead ends that require reversing direction
- Crossing paths from other operations
- Overall material flow of the facility as well as material flow of individual stations
- Market demands that may affect material flow and plant layout
- The number of people that handle each piece of material from start to finish
- Things that are being done manually that could be automated

By keeping each of these factors in mind when evaluating your site plan, you'll easily see areas that need to be repositioned or reorganized.

In addition to the development of your site plan, be aware of the following concepts that reach beyond the shop floor. Remember: material flow encompasses more than just manufacturing the product.

Job set-up in the office is critical to material handling in the shop. Material flow begins with management from the office. With computerized equipment it is becoming easier to become a paperless plant. This process alone has helped the material flow in many offices tremendously by removing the copying step. However, it doesn't mean you should stop looking at material flow.

How you batch raw materials cutting to the shop can be very important. If you just send the job to the saws, you could unknowingly cause a bottleneck in production. In some cases, you might be better off by first sending only the main

Continued on page 46

Batching for the shops current production needs versus "hitting send" can be very effective.

2 sawyers x 5 minutes = 10 minutes wasted

VERSUS

4 table crew x 40 minutes = 160 minutes wasted time

for the shops current production needs versus "hitting send" can be very effective.

Here are some other items that can help you get on the right material flow track in the office:

- Optimizing webs to a common length
- Running multiple load cases on the same truss type to increase quantities per set-up
- Scheduling the production lines for optimal use
- Eliminating any unneeded paperwork
- Limiting the number of inventory items used for production

Good material flow doesn't require the newest, most expensive machinery. Most of the equipment that is on the market today is faster and more efficient then what was available ten years ago. Yet there are plants that you compete with that have not taken advantage of today's automation. How can they compete with you price wise if your machines are faster and more efficient? Over the years, plants have refined their material flow to work within the limits or bottlenecks of their operations. Many have become extremely efficient with older equipment and have a hard time justifying adding new equipment within their current structure. Material flow is about seconds. Some of these plants that have been in business for many years have adjusted their operations to remove seconds, thereby increasing the frequency that finished product rolls out the door.

Let's look at an example. New computerized saws have drastically decreased the time it takes to cut pieces for a job. But faster cuts also mean you'll have to make adjustments in other areas. First, the new saw's footprint will most likely be

From the Inside Out...

Continued from page 45

span of the house to the saws, which might take only 15 minutes to cut. Following that up with the rest of the house could take another 40 minutes. This doesn't seem like it would make a difference and in some cases one could argue that this will make that new computerized saw run inefficiently and they would be correct. However, losing five minutes in inefficiency at the saw for two people, while having the main span completely cut and to the table 40 minutes quicker so the crew of four people doesn't run out of work, saves 150 minutes of otherwise wasted time. Thus, batching

remember:

Good material flow is not dependent on equipment, but on how you set up and use the equipment available.


Bomb Cart


Skate (or Roller) Conveyor


Customized "Lumber Train"

larger, thereby constricting the path of both incoming and outgoing lumber. Also, by cutting pieces faster, lumber needs to be received quicker than before. These issues may hold up the sawyer while the pieces are retrieved, and could also cause a back-up in the staging area. If you do not work on the inflow and outflow sides of the saw, your new computerized saw isn't going to save you any time.

Remember that there are many different types of equipment on the market that all accomplish the same task. Which one is the right choice for you? Should I use a "bomb cart," "skate conveyor," or an overhead crane to get materials to the table? Is a customized solution in order? In reality, all of these will work depending on the layout of the building. This is where your site plan will become your greatest resource.

Consider material flow on a broad and concentrated scale. Material flow should be considered from the large scale (site plan) to the small scale (how many items are handled at an individual work station). Looking at individual production stations is a little different than looking at the site plan as a whole. When looking at a station, consider ergonomics and speed. For instance, if stacking the pieces on the floor causes the assembler to make extra steps or bend over every time he needs material, extra seconds are tacked on to the time it takes to get materials in the assembly jig. Those extra steps can also pose the risk of muscle strain and fatigue. Ideally you should aim for one fluid motion that prevents the worker from adding unnecessary stress to his back, knees and shoulders. This could be as simple as looking at the height at which the materials are stacked in relation to the table.

Market demands affect material flow and plant layout. In some markets truss companies have decided to sell additional items like:

- Sheathing gables
- Nailing girders
- Sequencing trusses

While these are things that seem pretty simple, they can become a nightmare to the production personnel if the process or procedure has not been planned out with your current material flow.

While the prospect of evaluating material flow may seem daunting, remember this simple principle: Good material flow is not dependent on equipment, but on how you set up and use the equipment available. Good luck! SBC

do the math:

How long does it take to get your material to the assembly table? When you're looking for material flow savings at an assembly station, you need to look at shaving a few seconds off each truss set-up. If you cut five seconds off building one truss, and that line produces 300 trusses per day, you've just increased your production by six percent. **Calculation:** There are 27,600 seconds per production day. 27,600 seconds per 300 trusses = 92 seconds per truss. If you can cut five seconds off each truss—87 seconds—you'll be able to produce 18 more trusses per day. At an average $70 per truss and 252 working days per year, that totals $317,520 in added production per year. Not too shabby!

Crunching the numbers...

#Sec/8-hr shift*	Sec/truss	Total trusses built
27,600	92	300
27,600	87	318

*An average 8-hour shift includes two 10-minute breaks, resulting in 7 hours and 40 minutes of actual working time per shift.

STRUCTURAL BUILDING
COMPONENTS™
THE FUTURE OF FRAMING

www.sbcmag.info

Dear Reader:

The mission of ***Structural Building Components Magazine (SBC)*** is to increase the knowledge of andto promote the common interests of those engaged in manufacturing and distributing of structuralbuilding components to ensure growth and continuity, and to be the information conduit by stayingabreast of leading-edge issues. SBC will take a leadership role on behalf of the component industryin disseminating technical and marketplace information, and will maintain advisory committees consisting of the most knowledgeable professionals in the industry. The opinions expressed in SBCare those of the authors and those quoted solely, and are not necessarily the opinions of any of theaffiliated associations (SBCC, WTCA, SCDA& STCA) .

Truss Publications, Inc.

6300 Enterprise Lane • Suite 200 • Madison, WI 53719
608/310-6706 phone • 608/271-7006 fax
www.sbcmag.info • admgr@sbcmag.info