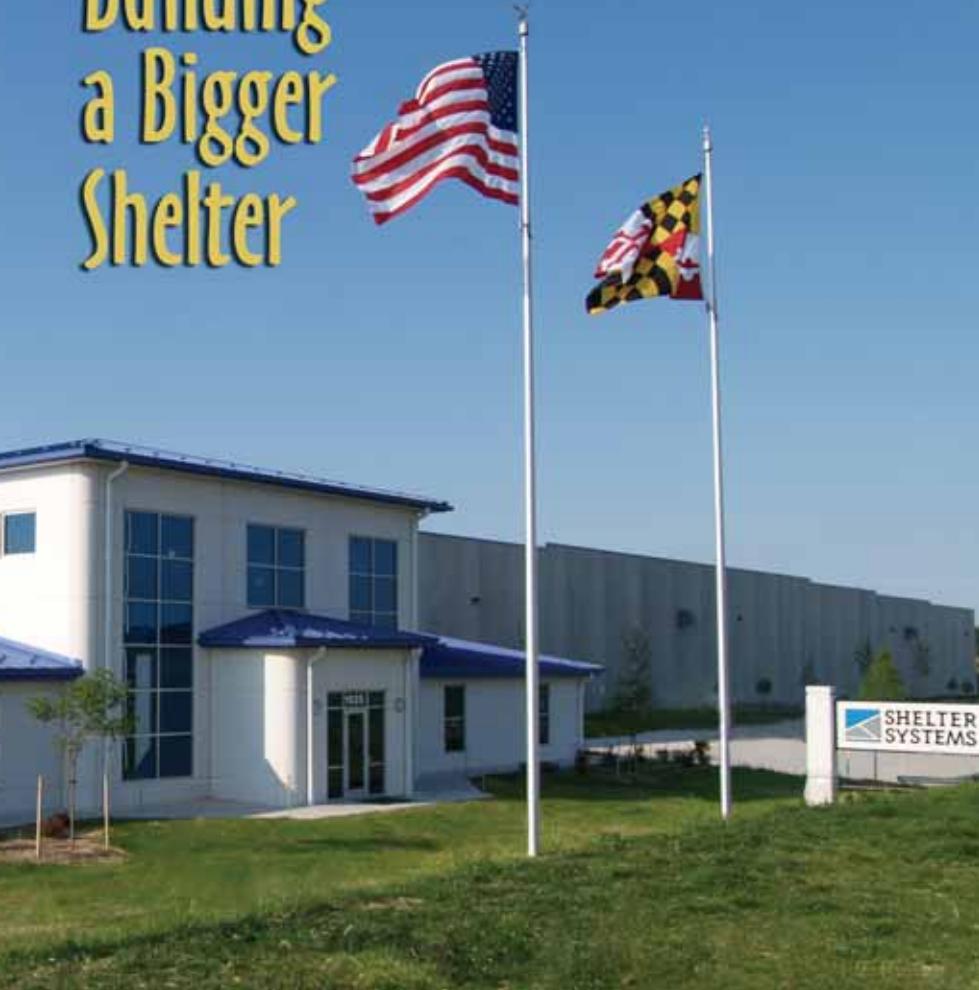


# Building a Bigger Shelter



When the time came to expand their business, the folks at Shelter Systems Limited redefined the term "smart growth."

by Sean D. Shields



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## at a glance

- This plant can store 103 trucks of material indoors.
- Can cut 35,000 pieces (165,000 board-feet) of lumber each day.
- In the future, Shelter's goal is to be able to hire 315 full time employees with annual sales topping \$110 million.

You may not find yourself doing this very often, but picture yourself as a stick of lumber. Better yet, imagine that you are a stick of lumber in the new Shelter Systems Limited plant in Westminster, MD.

First of all, when you arrive at this manufacturing plant, you don't have to spend a moment exposed to the cold or wet elements. Your "chauffer" delivers you inside the facility like a rock star, where you're stacked indoors along with a few hundred thousand of your buddies. Here you rest peacefully until you're needed at the Lumber Storage and Retrieval System (LSRS), a state-of-the-art stacking and sorting system designed to deliver the exact quantity, dimension and grade of lumber on time to the truss saw for each roof and floor truss.

Once it's your turn to be cut to size, you find yourself navigating the LSRS hydraulic lift and conveyer rollers to one of seven saws on the Shelter Systems plant floor. Once cut, you're labeled and banded for a short journey to one of four floor truss machines or one of the nine roof truss assembly stations. Within minutes, you're skillfully put into place by one of Shelter's 140 production experts, affixed with a plate and loaded on a cart for delivery to the yard.

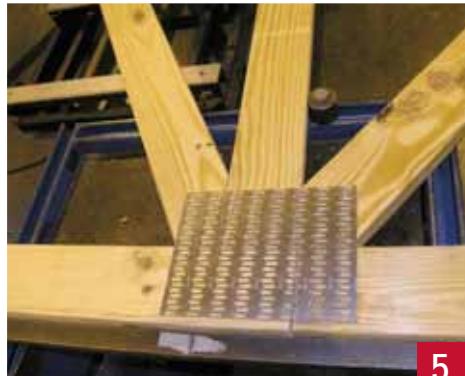
## The new plant took years of planning, careful execution and three generations of the Hikel family to pull it off.

Your first exposure to the elements is more pleasant than you would think. Thanks to a unique porous-paved surface, there is never a drop of standing water throughout the entire area. You'll never have to sit in water as you wait for a different "chauffer" to pick you up and deliver you to your final destination at the dream house of some fortunate new home owner.

Now, if you're happy being a stick of lumber, just think how Shelter's employees feel! The new plant didn't happen overnight, however. It took years of planning, careful execution and three generations of the Hikel family to pull it off.



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### A Family Affair

Let's begin at the beginning. Shelter Systems was started by the Hikel family—Dwight, his wife Linda and their son Joe—and a partner in 1976. Starting small, the original plant had a little over 14,000 square feet of production space, five employees, a saw and three truss assembly stations. In the early 1980s, the Hikels added an additional 18,000 square feet to their manufacturing facility, and eventually bought out their partner in 1993. By 2003, Shelter Systems was prospering, and it was evident that their existing plant could no longer handle the work orders coming in. It was clear that a new facility was needed.

Today, with a regional market extending virtually 250 miles in every direction, they are well situated to not only run their new facility at full capacity, but they envision a need for further expansion (we'll get to that a little later)! Dwight serves as President and CEO, Joe serves as COO, and Linda is the company's CFO. Joe's son, Jason, joined their information technology team in 2003, bringing yet another generation into the business.

### Inside-Out Design

When it became evident Shelter's manufacturing facility could no longer keep up with the demands of its customers, Dwight and Joe were sent packing—literally. For two years, father and son, along with key team leaders, traveled the world, from their own back yard in the Mid-Atlantic, to Florida, Minnesota, Mississippi, Ohio, California and Germany. They looked at how 25 other companies manufactured components, in an effort to gather innovative industry practices. At the end of the road, they found a number of good ideas, but nothing in their opinion significantly better than what Shelter was already doing. The Hikels then went back to the drawing board, calling in their manufacturing team leaders and designing each manufacturing area from scratch. Joe said, "We basically asked them, if you could lay this out in any way you wanted, what would it look like. We then took all those suggestions and created an overall layout."

1 80 percent of all the lumber stored at Shelter is no more than 25 feet from the saw where it is cut.

2 The Lumber Storage and Retrieval System (LSRS) allows lumber to be stored, sorted and accessed in a horizontal and vertical space.

3 Once the lumber is cut, it's labeled and banded for a short journey...

4 ...to one of four floor truss machines or one of the nine roof truss assembly stations.

5 Within minutes, it's skillfully affixed with a plate...

6 ...by one of Shelter's 140 production experts using a hand-held hydraulic press...

7 ...and loaded on a cart for delivery to the yard.

8 Thanks to a unique porous-paved surface, there is never a drop of standing water throughout the entire yard.

Continued on page 42

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### Building a Bigger Shelter

Continued from page 41

Thus, the new facility was truly designed from the inside out. Each aspect of the manufacturing process was analyzed by the guys who were doing it every day. That sort of introspection brought out ideas for efficient design and layout, as well as new approaches to old problems. In the end, for the workers out on the manufacturing floor, it was like Christmas, checking items off their wish list. (See photo 9.)

Once the manufacturing processes were laid out, the Hikels went to a local design-build general contractor, and asked them to design a building around it. Instead of trying to fit a square peg in a round hole, they simply made the hole a perfect square to fit. Once the footprint of the building was established, the only thing left was finding a place to put it.



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Instead of trying to fit a square peg in a round hole, they simply made the hole a perfect square to fit.

Eventually, they decided on an area adjacent to Westminster Regional Airport, and then construction began. (See photo 10.)

It took seven months from ground breaking to Shelter's first day of operation on January 31, 2005. Amazingly, Shelter did not have even one day of business interruption during the move from the old to the new facility. Most of the production crew simply left the old site on Friday and arrived at the new facility the following Monday. The facility they showed up to makes you weak in the knees!

### Competitive Edge

The sheer size of the plant is impossible to convey in words or pictures, you need to stand in its presence to get a real sense. But the numbers don't lie: 120,000 square feet of plant operations, another 11,000 square feet of office space, eight acres of EWP storage and transportation yard, and another 13 acres for future expansion. Even the ceilings are a whopping 34 feet tall!

What is even more impressive than a lack of business interruption is the fact they never posted a losing quarter—not even the first—in the new facility. While some re-training was inevitable, the redesigned plant layout was intuitive, and therefore took minimal time to adjust to. The new plant also moved over 30 component jobs inside the plant, out of those

Continued on page 44

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## Building a Bigger Shelter Continued from page 42

often cruel Mid-Atlantic winters and humid summers—just one aspect of how the new plant created an improved workplace for Shelter's employees. In the end, a happier worker is a more productive one.

The new manufacturing layout is also more efficient, thereby increasing responsiveness through quicker cycle times and decreased movement. Within the plant, lumber moves in only one direction, and it travels in straight lines. In virtually every case, once the lumber reaches the LSRS, it travels from saw to assembly, out the door and on to a truck without ever crossing a different job.

The increased capacity also allowed the company to shed its need to outsource production, one of the most significant drains on their overall profitability. In recent years, Shelter's business exceeded their plant's production capacity, and they had been relying on other regional component manufacturers to help them fill their orders. The new plant brings Shelter to the next level, and prepares it for whatever the future may bring.

### LSRS

There are two Lumber Storage and Retrieval System (LSRS) units at the new Shelter facility, which also happens to be the total number of LSRS machines in the world. In short, these babies utilize what Joe affectionately refers to as "cube space." They allow lumber to be stored, sorted and accessed in a horizontal and vertical space, ensuring that 80 percent of all the lumber stored at Shelter is no more than 25 feet



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from the saw it will be cut at, maximizing storage space while minimizing travel time and wasted movement. (See also photo 2 on page 40.)

Their ergonomic design allows a one-man crew to operate each machine, and enables him to retrieve lumber without ever having to lift a single piece. At peak, Shelter has been able to attain through-put rates of over 5,000 sticks of lumber per shift!

### Production Payoff

If you were paying close attention while pretending to be a stick of lumber, you would have noticed that Shelter manufactures two main products: roof trusses and floor trusses. They also have a custom-cut EWP product line located outdoors on the east side of the plant.

The lumber for the roof trusses travels through one of Shelter's two truss saws. The saw they are cut by determines which of the two lines of three 70-foot mono press stations they get delivered to—all in an effort to increase efficiency and eliminate the cross-over of lumber. Each of the mono press stations are manned by a crew of at least two, and once the cut lumber is laid out, one places the plates, the other follows behind with a hand-held hydraulic press to imbed the plates.

*Continued on page 46*



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- 11 Within the plant, lumber moves in only one direction and in straight lines.
- 12 In virtually every case, once the lumber reaches the LSRS, it travels from saw to assembly...
- 13 ...out the door and on to a truck without ever crossing a different job.
- 14 Innovation is the key. The "Shelter System Management and Reporting Tool (SMART)" software allows the Hikels to monitor everything from pricing and inventory to real-time workflow, job status and job costing. (See also photo 16 on page 46.)
- 15 And it's all monitored from "Truss Traffic Control" perched high above the manufacturing floor.

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Instead of a bonus program based on "slicing the pie" proportionate to an individual's effort, Shelter's system gives out equal slices and aims to bake a bigger pie.

## Building a Bigger Shelter

Continued from page 45

The lumber for the floor trusses and the webs are cut on two additional saws, and delivered to one of four floor truss machines. Shelter also has one 75-foot hydraulic table press, and two tables fed by a linear saw for work on specialized components and unusually sized or shaped trusses.



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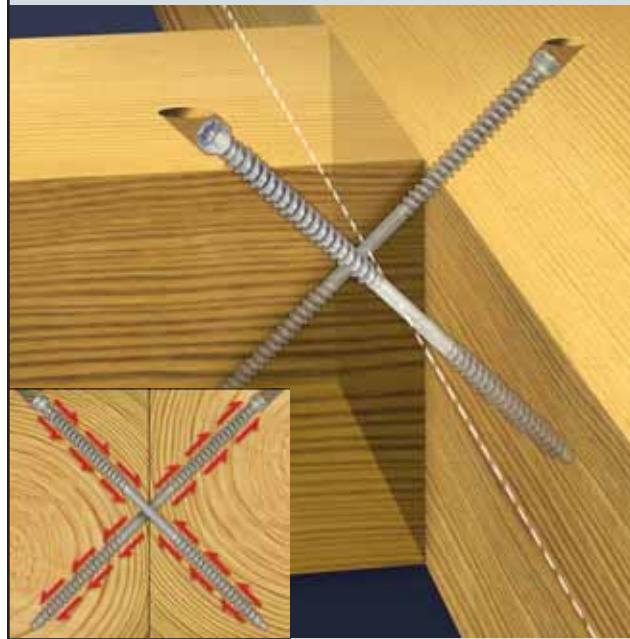
### Innovation

In addition to their innovative production line designs and the LSRS, Shelter has also made a significant investment in utilizing cutting-edge technology throughout the manufacturing facility. They have a staff of three IT specialists that help run the "Shelter System Management and Reporting

Tool (SMART)," software that allows the Hikels to monitor everything from pricing and inventory to real-time workflow, job status and job costing. (See photo 16.)

Not only does this help them keep track of their ongoing costs and overhead, it allows them the ability to institute a revolutionary work incentive program. Instead of a bonus program based on "slicing the pie" proportionate to an individual's effort, Shelter's system gives out equal slices and aims to bake a bigger pie. In Joe's words, "By tracking the jobs occurring on the plant floor in real-time, and providing that information to the work crews, employees encourage each other to work smarter to maximize overall through-put."

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For example, each job is tracked by the SMART system as it passes through each station along a manufacturing line. Each line is recorded separately, and each production team remains on a designated line. So, if at lunch all the employees enter Shelter's cafeteria and see on the monitors that Line 3 is producing significantly less product than the other lines, the other production teams can

Continued on page 48



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**17** Not only do jobs stay dry thanks to the porous-paved surface, they're always ready to go when a truck comes in. The Shelter yard has truck-trailer-sized staging areas for job assembly prior to truck loading.

**18** Three walls of the plant are precast panelized concrete construction, and the fourth wall is made of steel, designed to be moved.

**19** The office area is built using the same concept, three walls are permanent, one is meant to move. Why? For capacity that will be needed in the future.

same concept, three walls are permanent, one is meant to move. Why? For capacity that will be needed at some point in the future.

They've already designed the manufacturing line layout for an additional 60,000 square feet of plant area, the layout for 3,000 square feet of offices and an additional 13 acres of yard space. With that additional capacity, Shelter would have the ability to hire 315 full time employees and see their annual sales top \$110 million.

### Commitment

In this article, there are many aspects of the new Shelter Systems facility that have been discussed. Yes, it's big and it can store and process a lot of wood. Yes, it's designed well and runs with frightening efficiency.

Yes, it intelligently combines technology and innovation to not only create an outstanding product, but to also increase buy-in by employees. The most impressive aspect of this company, however, is not the plant, but the individuals running it.

The Hikels have shown a commitment to excellence, not only to their employees and community, but the industry as a whole. Shelter was the second truss plant in the nation to be certified in **In-Plant WTCA QC**, and Joe is the current chair of the WTCA Quality Control Committee. The Hikels have provided valuable feedback to improve the content and materials of the **In-Plant WTCA QC** program.

In addition, Bob Dayhoff, Shelter's Director of Technical Operations, has exhibited a strong commitment to WTCA's Truss Technician Training (TTT). Fifteen of Shelter's truss technicians are TTT certified, and three of their design team leaders have achieved Level III certification. Dwight, Joe and Bob have also provided valuable leadership with the WTCA Capitol Area Chapter, the WTCA Board of Directors and the WTCA Engineering and Technology Committee.

The design of the new facility with expansion in mind is yet another example of their commitment to build things to last, whether it's a solitary roof truss, or a multi-million dollar business. **SBC**

## Building a Bigger Shelter

Continued from page 46

encourage the Line 3 team to pick up the pace. In the end, every employee receives the same bonus per hour worked, so it is dependent on the overall total product sent out the door.

Think back to being a stick of lumber: remember how dry you stayed not only in the plant, but out in the yard waiting for delivery? It's made possible through a revolutionary porous-paved concrete surface that wicks up to 79 inches of water per hour! As a consequence, puddles never form in the yard, and Shelter didn't have to devote any land to storm water management.

### Expanding Capacity

Here are some additional numbers for you to salivate over. At Shelter's current capacity, they can store 103 truckloads of material indoors at any given time. At peak operation, they can cut 35,000 pieces of lumber each day, or approximately 165,000 board-feet. But wait, there's more!

The Hikels were thinking beyond the next horizon when they built this facility, not about where they wanted to be today, but where they will need to be tomorrow and beyond. First, the production area: three walls of the plant are precast panelized concrete construction, and the fourth wall is made of steel, designed to be moved. The office area is built using the

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