

Dave Steel Company, Inc.'s two fab shops, each in a different Carolina, are night and day in terms of practice but right in tune when it comes to a commitment to innovation.

City Fab Shop, Country Fab Shop

BY GEOFF WEISENBERGER

THE TWO FABRICATION shops of Dave Steel Company, Inc., are geographically separated by 67 miles and a state line. In terms of feel, they might as well be on different planets.

The first shop, located in Asheville, N.C., serves as the company's corporate headquarters. It includes a 125,000-sq.-ft fabrication facility sitting on five acres, and is bound by cliffs on three sides and a state road on the fourth.

The second shop, in Chesnee, S.C., does not share these space limitations. Sitting on 33 usable acres, the facility contains separate buildings for each main operation. Where the Asheville shop is somewhat constrained by its past, the Chesnee location is designed with plenty of room to grow, in terms of both size and technology. One thing the two shops share, besides the name, is a commitment to taking the structural steel fabrication industry into the future.

Established but Flexible

While the Chesnee plant is the newer of the two shops and was built with expansion in mind, the Asheville facility is critical to the ongoing operations of Dave Steel. It will remain as the location of the corporate offices, as it houses management for production, sales, accounting and purchasing duties. (The company also has an office in Cincinnati, which houses engineering and drafting management staff.)

The Asheville shop is a conventional fabrication operation, with all processes under one roof, and employs more traditional material handling practices. Steel, most of which is stored under-roof, is transported through the shop by crane, and due to lack of space must be live-loaded onto trucks. The shop consists of both newer and older fabrication equipment. While the newer equipment is able to fabricate steel based on data from 3D models, it still requires manual interaction for moving the material through the process and operating the equipment. Fabrication machinery from three major manufacturers is present in the shop: Ficep, Peddinghaus and Controlled Automation.

The operation, which currently employs 34, remains flexible so that individual pieces of equipment can be replaced based on the shop's needs in a specific area, and the shop is in the process of being converted from medium- to higher-labor work and also to handle quicker "in and out" needs.

"Flexibility is the key in Asheville," says Jeff Dave, president and CEO of the company and AISC's Chairman of the Board of Directors. "The recent downturn gave us the chance to make some significant changes and upgrades to the facility. In many cases, it's easier and more efficient to process material through the shop the more conventional way. We have a good balance of taking advantage of new technology but not limiting ourselves to projects that require it."



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Room to Grow

Where the Asheville shop is akin to living in a small urban loft, the Chesnee shop is more like moving to the country, buying a big plot of land and building a brand-new house in the middle of it—less traffic and plenty of room to spread out.

Dave explains that prior to opening the Chesnee location, the company had space management issues in Asheville that limited the number of fitters and welders that could efficiently be supported.

“The same stations were used for both long columns and shorter members,” he says. “Therefore, if we maximized the number of fitters based on the smaller work, these workers could not stay busy when sequences of heavy, long, labor-intensive columns went through the shop, tying up three work stations for an extensive period of time. By having the smaller work done in Asheville and moving the larger work to Chesnee, we can increase the number of fitters and welders in Asheville and better manage our space at both locations.”

Development for the Chesnee location began in 2006 and continues today on the 33-acre site. The facility, with a staff of 44, is currently comprised of three buildings: a 2,800-sq.-ft material processing building, a 45,000-sq.-ft assembly building and a 36,000-sq.-ft coatings building. An additional 28,000-sq.-ft assembly building is in development and is scheduled to be on-line in late 2014; it will add 22 more employees.

Unlike Asheville, Chesnee’s buildings are insulated and enclosed, as well as cleaner, brighter and more open. Flat, level floors, plenty of space and large doors at either end allow steel to be brought in and moved throughout the shop with side loaders.



Dave Steel

- ▲ Steel storage at the Asheville facility.
- ▼ The Asheville shop includes all fabrication processes, as well as material storage and loading operations, under one roof.



Dave Steel



Dave Steel

- ▲ iPads have become the norm at both of Dave Steel’s facilities...
- ▼ ...meaning no more shop drawings hanging on the wall.





▲ Dave Steel's Ficep saw. The company plans to install a smaller saw as well so as not to tie up the main saw with smaller jobs.



▲ The coping machine, which performs both oxy and plasma cutting.

But why have separate buildings, especially ones that are actually smaller than the Asheville location? It's a matter of keeping the value-added operations under the roof and moving everything else—material storage, staging and loading—outside.

"Traditional shops have a lot of material handling under one roof, and it becomes too easy for scrap, voided material and drops to build up in areas of the shop—especially problematic when you've got limited space," Dave explains. "In Chesnee, it's much easier to keep the separate buildings clean—and therefore safer. In addition, we look at work taking place inside the buildings as adding value to the material. Material handling equates to work we aren't getting paid for, per se, and having separate buildings makes it much easier for us to design, implement and monitor processes individually and make them more efficient."

Once steel arrives at the Chesnee facility, it is virtually untouched by human hands as it moves through all of the processes. Dave Steel employs a color-coding and barcode system for tracking steel through the various fabrication stages (it uses the same tracking system at the Asheville shop). As there are separate buildings, side loaders and forklifts are used to move the material from building to staging area to building. Steel is easily maneuvered inside as well as outside, without being physically touched by hands and cranes (cranes are only used to turn material as needed).

When steel is transferred to the material processing building, it is put on skids at one location, scanned into the system using a barcode on the cut list and routed through the equipment (drill, saw and coping machine), all the while automatically using the 3D model and a series of matrices without any manual control of transfers or conveyors. Simulators and clash detection software provide planning and management tools before processing the steel, and material can be monitored and tracked by management at any time throughout the system.

"In seconds we can run a sequence of steel through simulator software to help manage individual bottlenecks and identify model/file issues, and rectify them before placing material on the skids," says Dave. "You get to see the material run through the shop before it actually goes through."

While this processing is done by three machines, they work as one system, using software and equipment from a single manufacturer. In this case it's a Ficep system, and Dave Steel is the only fabricator in North America—and one of the few in the world—currently using it.

Being the first to the table has given the company the valuable opportunity to work regularly with Ficep to improve upon and add many features to maximize efficiency

and flexibility. For example, a recent upgrade to the software, facilitated by Dave Steel, is expected to improve the efficiency of the automated coping process by another 25%.

The coping machine, along with the saw and drill operation, transfers, conveyors and the 3D model, work together to provide the end result, which is a processed product ready for assembly. Once material is placed on the in-feed skids, one person is able to attend to all drilling, cutting, scribing and coping processes. Previously, 35% of a fitter's time was spent laying out, burning and cleaning copes and flange strips, but now layout and burning are performed by the coping machine and the grinding is now merely a "dressing up" of the thermal cuts. The system is not only more automated but also expandable.

"It is truly a SimCity reality show," laughs Dave. "The processing building is designed for expansion. As we grow, we can add appropriate equipment to the system in the best setup, update the model and matrices and move on in the same manner."

Beyond the material processing building, the assembly building is designed for complete flexibility of fitting and welding needs. When it comes to coatings (as an industrial fabricator, this is a major part of the process for Dave Steel) three acres are designated for outdoor cleaning and painting of very large assemblies, and the state-of-the-art interior paint shop is completely temperature- and humidity-controlled.

Solid Interoperability

Perhaps the most innovative thing about Dave Steel's operation is a commitment to technology that's typically not found in fabrication shops. Given the company's multiple facilities, a solid IT platform is not only critical but also provides endless opportunities for process improvements that can result in major cost savings. For example, the company's adoption of

iPads just over a year ago has vaulted it to a whole new level of efficiency.

"We projected that implementing iPads would be a hard sell to shop employees, especially the more tenured ones," recalls Dave. "It was actually the easiest thing we have ever implemented in our shop."

Having tablets in an industrial space might seem like a recipe for disaster, but the company protects its iPads with Defender Series cases and has only had to replace one case in the last year (out of 32 iPads). Dave Steel also has a regular plan in place for regular review of cleanliness, performance and iOS update needs for the devices.

By now, the iPads are simply "tools of the trade." Clipboards of gather sheets and flat files/cubbies for shop drawings are empty.

"There are no drawings or gather sheets in either shop," says Zac Parker, Dave Steel's interoperability coordinator. "There's no more printing of shop drawings, looking for missing drawings or managing revised drawings. Just this one step has allowed us to redirect the efforts of three people."

"Theoretically, in the past we would have fab drawings in the lift of material, so when the lift was sent to fitting, the fitters would have the drawings they needed," explains Dave. "Practically, that worked 85% of the time. The rest of time the fitters would either go get their own drawings or get someone to go get drawings for them. This was taking away time from the fitters actually fitting. Once the iPads were implemented, we were immediately able to redirect the efforts of the employees to manage revised drawings."

Besides embracing technology and minimizing worker movement—thereby increasing safety—between the steel and the printer or wall (there is still a printer in the shop, as a backup),

▼ The 2,800-sq.-ft material processing building.



▼ Steel, ready to be processed hands-free.





▲ The coping machine, one component of the company's fabrication processing system.



▲ Materials are stored outside at the Chesnee facility.



the iPads also illustrate the company's concerted effort to eliminate paperwork. Its QC manual, safety manual, audits and routine maintenance checks are all now solely electronic and accessible via iPad. And the company is even working to develop an app to better access these files via PDA.

"There will be an app for that!" laughs Parker.

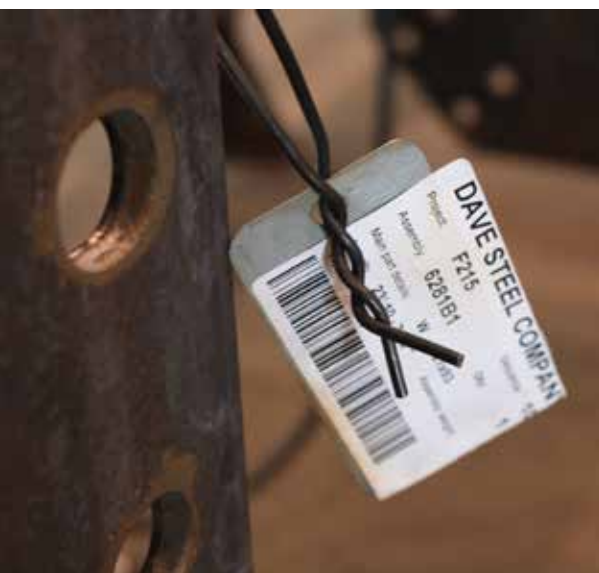
Of course, there are issues—such as ensuring that everyone has the same versions of the various software packages, as well as maintaining redundancies in the IT system—but as with the fabrication system and software, these will im-

prove with time and effort. And Dave stresses that with this effort will come even more innovative ideas to implement, which in turn will open the door to a whole new generation of tech-savvy workers.

In addition to rolling out iPads, all of Dave Steel's facilities have WiFi (as well as a local server for backup)—not just in the offices but for the entire Asheville shop and all 33 acres of the Chesnee facility (while implementing WiFi for two large industrial facilities might seem like an exorbitant endeavor, Dave notes that installation and ongoing

▼ Each member that passes through the shop receives a barcode sticker, part of the company's tracking system.

▼ The temperature- and humidity-controlled coatings building.





▲ The assembly shop of the Chesnee facility.



▲ The shop is one of three buildings at the Chesnee facility, which sits on 33 acres.

costs have been negligible). This connectivity lets management check on actual job progress by viewing real-time displays of production tracking, based on the barcode scans, and even watch live emulations of the processing equipment building.

“In addition to going back and forth between our facilities, my travel needs have required a significant amount of time away from the office,” says Dave. “Technology can never replace the great employees that we have, but it helps me stay connected to what is going on.”

So far, embracing technology and looking at new ways to perform structural steel fabrication have paid off. And Dave doesn’t see this as an experiment but rather the way business needs to be done from now on.

“We’re ahead of the curve and when many people come to visit us, they believe it’s just too early to be doing some of the things we’re doing,” says Dave. “It’s a matter of progressing in stages and determining when you’re ready to take certain steps. But you’ve always got to move forward.”

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▼ The shot-blaster. Members that are too large to run through it are blasted outside.



Dave Steel

▼ Out the door and ready to go.



Dave Steel