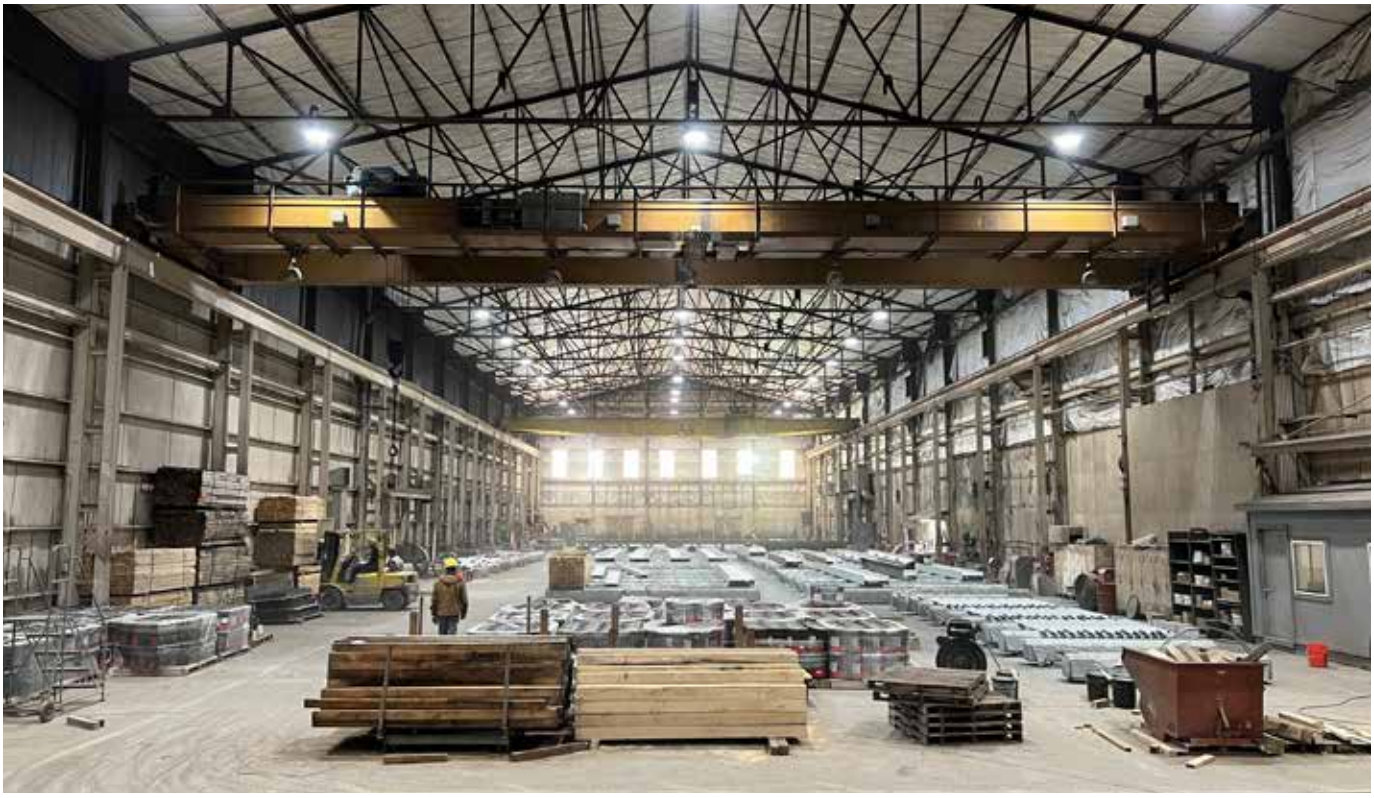
Push and Pull

BY DERRICK FITTON AND JUSTIN JENSEN

Implementing an internal resource management system to "pull" rather than "push" work through your shop will result in better shop efficiency and fewer headaches.



LIFE AS A STRUCTURAL STEEL FABRICATOR is anything but simple and certainly never boring.

If you're not dealing with unprecedented challenges resulting from a pandemic, there are continuous design and schedule changes to keep things interesting. All these challenges beg questions like "How am I supposed to plan my work with so many things uncertain and out of my control?" and "Would mowing lawns be a better career choice?"

While it's easy to let those external challenges impact your shop schedule, Drake-Williams Steel has intentionally built a structure where the lean principle of "flow" drives our shop schedule. When you create tools and processes to steady the production flow, you can effectively schedule and use your number one resource: your shop. Then, and only then, will you be able to optimize your performance through the best and worst of times.

This may seem like a no-brainer, but the reality is that too often, fabricators are "pushing" the work through instead of "pulling" it. This often results in an uneven workflow and underused resources. We have identified two key areas that, when managed correctly, can positively impact the flow and productivity of your shop resources: backlog management and daily resource management.

Backlog Management

Shop resources and flow can be hard to manage if you don't accurately track your existing and potential backlogs. To avert any issues, a team of our employees spends hours each week discussing and managing our current and potential backlogs.

We use an internally developed shop schedule in Excel that summarizes all our current projects. Each project is scheduled at the sequence/phase level based on the most current customer delivery requirements. While this spreadsheet is managed by each division individually, the data is combined to give an accurate picture of the total company backlog. This allows us to manage our overall workload and determine if work needs to be shifted between divisions to ensure all our resources are used to their fullest extent. As potential or existing project schedule changes arise, we modify this file to evaluate any impact on our overall schedule. In addition, our sales and production leaders meet weekly to review the backlog schedules as well as any potential bid opportunities, which

are managed through our bid and sales program, Access.

It's critical that we understand and evaluate the shop hours associated with each opportunity as well as the impact on the overall production schedule. The crystal ball tends to get a little fuzzy when you start talking about potential projects that might be early in the design process, but we do our best to estimate each project's size and schedule.

The reality is that we must evaluate and respond to at least one schedule change during most of our projects. With that in mind, we expect our project managers to provide weekly schedule updates so we can adjust our priorities as needed and minimize schedule changes to our overall production flow. These efforts also allow us to provide commitments, with a high level of confidence, to our customers.

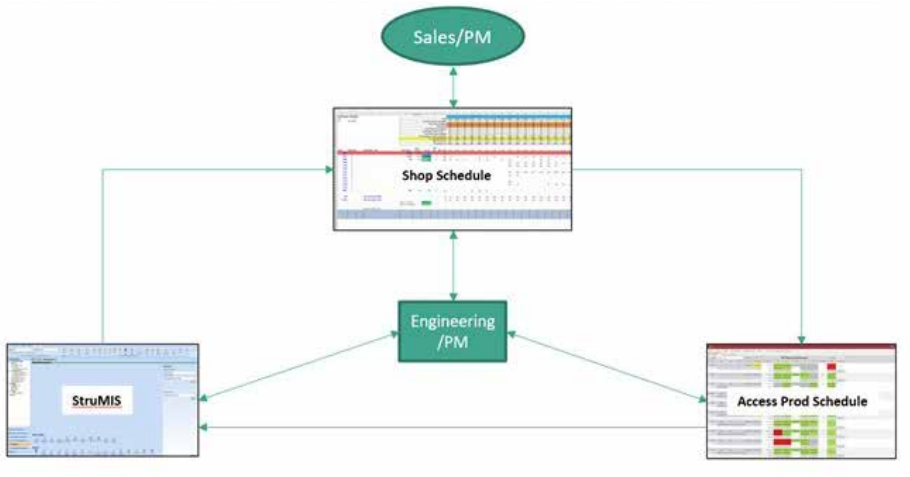


Fig. 1. Shop schedule—productive flow summary. This diagram represents a defined flow of information between all our tools that enables a productive flow of information and resources throughout the entire process.

Daily Resource Management

Most fabricators have been involved in building information modeling (BIM) discussions to review the Level of Detail (LOD) in their steel models, and the same mindset should be applied to shop resources as well. The focus should be on the question, "To what level of detail should we manage our daily shop resources?" Should we manage our resources at the department level, equipment level, or maybe down to the individual? There is not a right or wrong answer, but that decision can affect your ability to support the desired production flow.

A good place to start is with your estimating capabilities. It's hard to manage your shop resources at the equipment level if you are only breaking down your estimated hours to the department level. No matter what level you manage these resources at, it's important that the two are aligned so you can effectively schedule and evaluate your production.

If the Excel backlog tool we mentioned is the 30,000-ft view of our shop schedule, our Access production schedule provides us with a 1,000-ft view. We created this tool to allow us to schedule each respective sequence/lot to the corresponding departments in our shop: processing, fabrication, finishing, and loading. Each department is then broken into more detail by workstations. For example, processing is broken down by each piece of equipment, while we will split fabrication into our four different fab bays.

The internal production schedule is prioritized by workstation start dates rather than customer delivery dates. These start dates inherently create a pull system as each department helps to define the priorities of the preceding department. At the end of the day, to sustain the desired flow of work, we need to balance the requirements of our external customers with the needs of our internal "customers" or departments. Once work is prioritized for each respective department, we can produce workstation-specific priority reports to help operators and other employees map out their workloads.

While the Access production schedule helps us map out each sequence/lot by workstation, it does not give us specific piece tracking. We use the program StruMIS to give us the final 10-ft view and to track individual pieces throughout production. Each department/function can produce outstanding work reports that show what specific pieces are currently ready for them to work on. Once each individual process is complete, production floor employees move the piece forward to the next function in StruMIS to track their workload in real time (see Figure 1). By using our Access production schedule and the tools of StruMIS, we have been successful at implementing a "pull" rather than "push" mindset in our shop. And in doing so, we've streamlined our workflow, used our resources to their full potential, and made customers, both internal and external, happier. ■

This article was excerpted from the 2022 NASCC: The Steel Conference session "Scheduling Shop Resources to Create Productive Flow." A recording of the presentation will be posted at ***aisc.org/educationarchives*** *in early May.*

Derrick Fitton (**dfitton@dwsteel.com**) is the director of operations for the structural division and **Justin Jensen** (**jjensen@dwsteel.com**) is the production office manager, both with Drake-Williams Steel in Omaha.