



**TEKLA**® Structures



TEKLA STRUCTURES IN PRACTICE:

**DYNAMIC STRUCTURAL STEEL  
UNITED STATES**

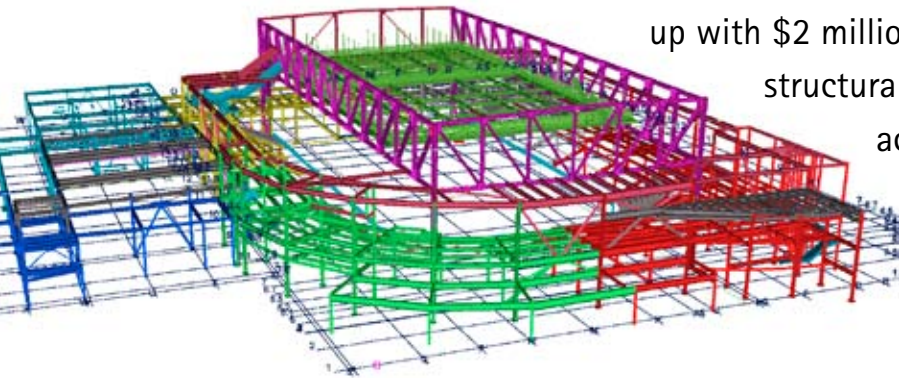




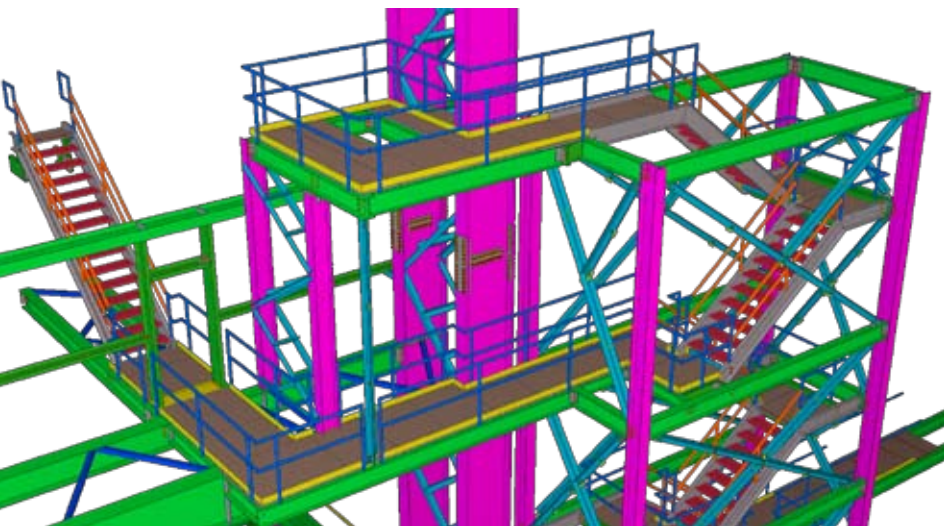
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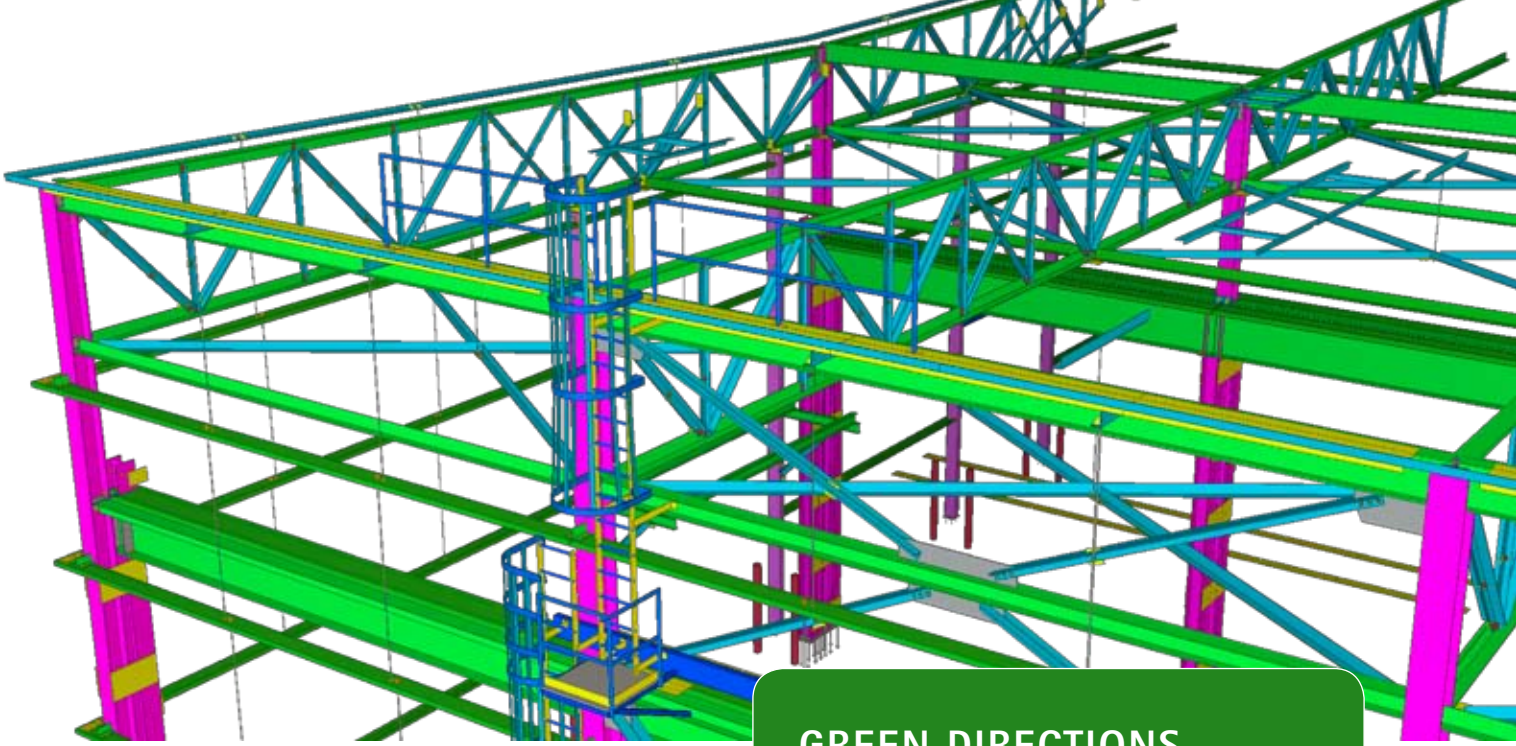
# YOUTH AND TECHNOLOGY HELP REDEFINE THE STRUCTURAL STEEL PROCESS

➤ In an industry dominated by experience and longevity, Dynamic Structural Steel in Proctor, Minnesota, is an anomaly. Established in 2006, the structural steel fabrication company is the new kid on the block, with neither history nor reputation to drive business in a highly competitive market. Yet, in just three years time, the company has gone from a regional start-up with \$2 million in sales its first year to a leading structural steel fabricator in Minnesota and across the nation with over \$15 million in sales in 2008.



➤ According to 27-year-old owner and president, **Jason Erickson**, the company's startling success is largely due to an impressive and powerful combination of the most advanced fabrication equipment, tools and processes combined with the latest building information modeling (BIM) technology. Erickson explains, "We needed an edge to compete in this market. I knew if we could streamline the entire fabrication process – make it faster, more accurate and fully automated – we could redefine the steel fabrication market, and redefine customer service in our business."





## GREEN DIRECTIONS

> Dynamic Structural Steel is working with Tekla to create a completely paperless fabrication shop. As a first step, the fabricator has installed 32-inch monitors on the shop floor to eliminate paper drawings. Jason Erickson, president and owner of the company says, "This is just the start of our green initiatives. Since steel is already the most recycled product on the plant, it only makes sense to try and reduce the next most used product in our plant."

## VIRTUAL FABRICATION

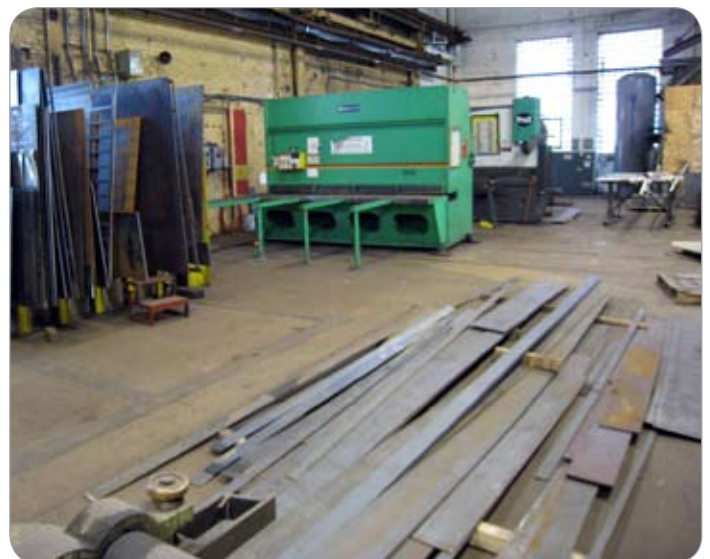
> Dynamic Structural Steel fabricates custom-designed structural steel components for use in commercial and industrial buildings of all sizes and sub-assembly parts for use by other manufacturers. Its fabrication plant includes over \$6 million in state-of-the-art technology, a 65,000 square foot production facility with over 100 tons of lifting capacity and 11 acres of Wi-Fi connection to track every piece of steel.

The heart of the operation is a fully automated fabrication process with the latest production computer numeric controlled (CNC) fabrication tools, multiple Ficep drill line's that can cut, drill and scribe steel beams up to 75 feet in length, coupled with high definition plasma cutting robots – all digitally integrated with the Tekla Structures Steel Detailing BIM software.

Every steel component is detailed and fabricated with speed and precision. Typically, a customer provides 2D structural drawings which Dynamic Structural Steel's detailers use to build a 3D computer model of the component within the Tekla steel detailing software.

Erickson explains, "Tekla software has the amazing ability to take BIM to the next level. It allows our engineer to analyze models quickly. Connection design is a snap due to the auto connection features within the software. With the 3D model, we are able to immediately see clashing issues with other trades."

Once the client agrees that the 3D model is accurately detailed, the detailers send the model to the MRP system (FabTrol) for optimization, nesting and material purchasing – an automated on-demand delivery system that minimizes inventory.





Since the Tekla software is tightly integrated with Ficep tools and scribing technologies, the fabricators simply download the approved Tekla 3D model into the appropriate equipment on the production floor.

To automatically send a Tekla model to the Ficep tool, the detailer initiates the Tekla Steel Project postprocessor. All CNC stamping, cutting, coping, drilling, sawing and scribing is written at this time. The resulting file is then imported to WinSteel which controls the Ficep CNC machine. With this automated data extraction from Tekla to the Ficep computer, users can use the special scribing tool to write lines and characters related to the assemblies that will be later fit up on the main members of the processed parts.

Erickson explains, "Tekla Software has the very unique quality of automating the layout process. What used to be done by three expensive layout personnel is now completely automated. The CNC data moves from the Ficep's Winsteel program which then downloads layout lines and even subassembly marks to the Ficep machine's

Arianna controller which, coupled with the integrated scribing tool, will layout all sides of the steel as it's processed."

Production crews process the steel through numerous machines for fit up and welding, and then send it down the automated assembly line to the paint department. At this point, the component or assembly gets one last check by the Dynamic Structural Steel quality control department, and then it's scanned and loaded onto trucks for delivery to the jobsite.

"Bottom line, we are able to do twice as much work, with a better quality product and fewer people," emphasizes Erickson. "Because the fabricators are working with the real as-built model, there is less chance of error. We're simply more efficient which means a faster construction process. From the start, the steel designated for a component is bar-coded so that we can track fabrication at every moment. If contractors or engineers need to make a last minute change, we can facilitate those changes with minimal costs."



This efficiency has captured the attention of a number of large and small customers, including the owners of the \$260 million Mesabi Nugget project.

## INSIDE OPERATIONS

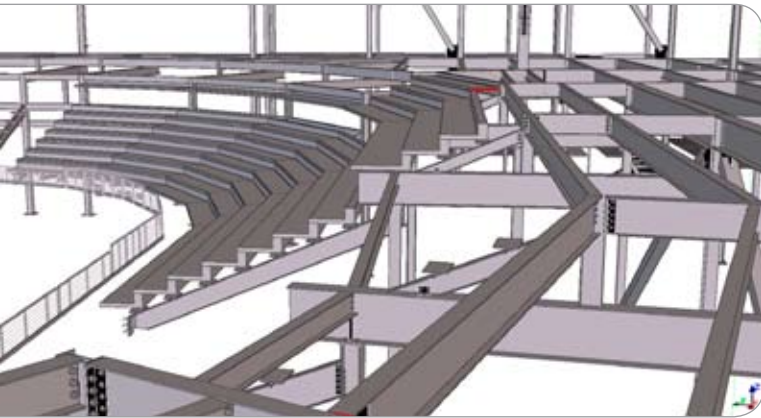
> The Mesabi Nugget project near Hoyt Lakes, Minnesota, is the world's first commercial iron nugget plant. Expected to begin production later this year, the plant will produce high volumes of 97 percent-pure iron nuggets through a process that the owners say is as both environmentally friendly and energy efficient. Mesabi Nugget is expected to produce about 500,000 tons of the material every year.

Over the last year, Dynamic Structural Steel has provided more than 8,000 tons of steel to support the plant construction. This project contained a wide range of steel components and assemblies from equipment platforms to heat recovery and evaporator structures to

the concentrator buildings with 130-ft tall, 8-ft wide 100,000-lb lattice columns.

"The owners needed the entire production facility to be operational in 18 months," recalls Erickson. "The entire project team from engineers to fabricators required open communication and 3D visual understanding of every stage of the project to keep plant construction on schedule."

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Because of the state-of-the-art technology and processes used during construction, the Mesabi Nugget plant is the fastest large-scale mining production operation built in the world to-date.

Though smaller in scale, the owner of a new fast-track, three-story YMCA building in Green Bay, Wisconsin benefits from similar production efficiencies.

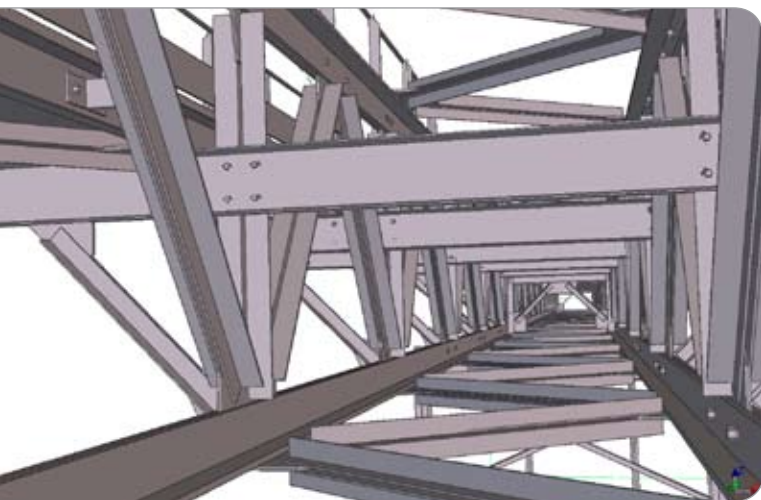
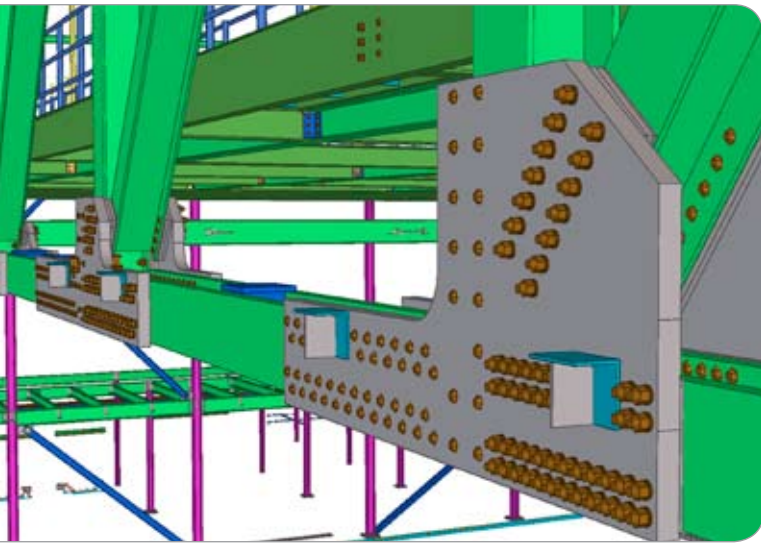
"In this case, the contractor called on a Thursday afternoon," says Erickson. "We put the schedule together that evening, prepared the shop drawings by Sunday night and became fabrication that same week. The entire building was erected in just 14 days from the original order – that's the technology edge. It allows us to provide extraordinary service and quality to customers, anytime, anywhere."

Other Dynamic Structural Steel projects include a new large casino in Danbury, Wisc., which houses a 91,000-pound 100-ft long steel truss fabricated by five different CNC machines. The precision fabrication process helped ensure all 2,189 bolts dropped into place without any reaming.

This list of clients and projects is long. From train stations to lime processing plants to sports and entertainment facilities, Dynamic Structural Steel continues to build a reputation for speed, quality and precision.

Erickson concludes, "The fabrication business is pretty tight. Most fabricators have been around for 50-60 years. If it wasn't for technology, there's no way I would have been able to break into this industry. The customers today want a faster than ever construction schedule. Our success depends on our ability to give customers what they want, when they want it in a continually demanding environment."

With technology as a key facilitator, Dynamic Structural expects to continue its impressive growth in the coming years, and in turn, help revolutionize and modernize the business of steel fabrication.



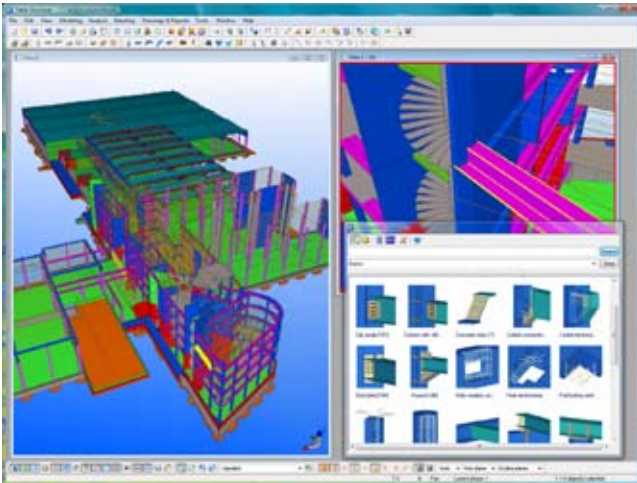


# TEKLA STRUCTURES – INTELLIGENT 3D MODELING



> Tekla's model-based software products make customers' core processes more effective in building and construction and infrastructure management. **Tekla Corporation** has area offices and partner organizations worldwide. International operations account for more than 80% of net sales. Founded in 1966, Tekla is one of the longest operating software companies in Finland.

> Tekla's technology creates new opportunities for the construction industry. **Tekla Structures**, the most advanced BIM (Building Information Modeling) software on the market, provides an accurate, dynamic, and data-rich 3D environment that can be shared by contractors, structural engineers, steel detailers and fabricators, as well as concrete detailers and manufacturers. The highly detailed as-built structural models created in Tekla Structures enable the highest level of constructability and production control. Centralizing model and non-model based data into the model allows for more collaborative and integrated project management and delivery. This translates into increased productivity, elimination of waste, and an enhanced value for structural modeling.



Tekla is an anti-piracy member of BSA (Business Software Alliance) in the EMEA, APAC and Latin America.

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