

VECTOR PRAXIS, INC.

INNOVATING A TALL, CAPABLE MODULAR BUILDING SYSTEM WITH SOLIDWORKS



Using SOLIDWORKS design, simulation, and product data management solutions, Vector Praxis has accelerated the development of high-end architectural fabrication and building systems. Most recently, they have created the VectorBloc modular construction system, an innovative cast-steel connector for hollow structural section (HSS) construction, which supports the erection of steel buildings more quickly and affordably.



Challenge:

Speed up building construction design cycles while improving design visualization and communication with tooling suppliers, customers, architects, and partners.

Solution:

Implement SOLIDWORKS Premium design, SOLIDWORKS Simulation Premium analysis, and SOLIDWORKS Enterprise PDM product data management software.

Benefits:

- Cut design time by 75 percent
- Went from concept to cut files in two weeks
- Saved \$100,000 on tooling and production with simulations
- Introduced revolutionary modular construction system

Julian Bowron likes to build. From the feature stairs, large-scale public artworks, and offsite fabricated interiors that his former companies produced, to the high-end architectural fabrication and building systems supplied by Vector Praxis, Inc.—the company he founded in 2011—Bowron has always had a knack for identifying the most efficient, successful, and cost-effective way to build something.

Today, Vector Praxis works on an extraordinary range of projects, providing architectural fabrication and construction services that utilize multimaterial, multiprocess skill sets. The company has experience working with a variety of materials and methods—from heavy structural steel to finely crafted stainless steel, structural glass, composites, stone, wood, lighting, and electronic systems. The key to the company's success is the one-of-a-kind tooling and fixtures required to execute unique work. These are built in the company's fabricating shop in extensive collaboration with owners, architects, commercial fabricators, and general contractors to bring to fruition construction projects that face myriad challenges.

President Bowron's previous experience with design tools used by the other companies that he founded—including the transition from AutoCAD® 2D drawing software to the SOLIDWORKS® 3D design platform in 1999—made him very aware of the benefits of using SOLIDWORKS to support architectural fabrication and design at Vector Praxis.

"Designing in 2D, which was the way everyone worked many years ago, was tedious and inefficient," Bowron explains. "I very quickly understood the benefits of working in 3D because of the obvious improvements in visualization. The ability to clearly see an issue in 3D, solve the problem, and effectively communicate manufacturing solutions was like a revelation. Combined with the ability to leverage 3D for FEA [finite element analysis] and manufacturing provided additional productivity gains. By transitioning to SOLIDWORKS 3D, our productivity rapidly outstripped our competitors."

That's why Vector Praxis has utilized the SOLIDWORKS 3D design platform—including installations of SOLIDWORKS Premium design, SOLIDWORKS Simulation Premium analysis,

and SOLIDWORKS Enterprise PDM product data management (PDM) software—from its founding, because the solutions are easy to use, provide integrated capabilities that increase efficiency, facilitate communication through enhanced design visualization, and help the company accelerate development. The company recently added SOLIDWORKS Composer™ technical communication software to support design reviews, sales and marketing activities, and erection and assembly instructions.

"SOLIDWORKS 3D design software stands out from the rest and is the most popular, widely used CAD tool in the Toronto area," Bowron adds. "Because SOLIDWORKS is so well known, we were able to attract talent, build a workforce, and get up and running very quickly."



"The VectorBloc system represents a revolutionary approach to HSS-based steel building construction because it combines tight tolerances and modularity in the construction of tall buildings. Using SOLIDWORKS design configuration, FEA, and visualization capabilities proved to be critically important to helping us develop this system quickly and cost-effectively."

— Julian Bowron, President

BETTER WAY TO CONSTRUCT TALL BUILDINGS

Using SOLIDWORKS solutions, Vector Praxis developed and introduced the VectorBloc modular construction system, an innovative cast-steel connector for hollow structural section (HSS) construction, which supports the erection of steel buildings more quickly and affordably. Inspired by the ISO corners used to build ocean freight containers and endorsed by leaders in the modular and steel fabrication industries, the VectorBloc system has multiple features that make it ideal for the fabrication of offsite-completed modules, which then stack and bolt together to create fully braced buildings of almost any conceivable shape. VectorBloc applications include offsite construction of residential buildings, data centers, energy plants, and chemical facilities.

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Focus on Vector Praxis, Inc.

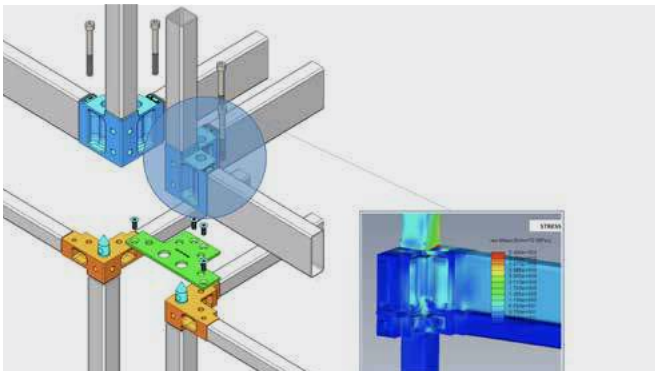
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Vector Praxis relies on SOLIDWORKS Simulation capabilities to validate the performance of systems like the VectorBloc and SOLIDWORKS eDrawings tools to communicate design information with customers, partners, and production.

FASTER DESIGN, LOWER COSTS

With SOLIDWORKS design, simulation, and PDM solutions, Vector Praxis was able to develop the VectorBloc system extremely quickly, saving time and money in the process. "Using SOLIDWORKS tools, we were able to develop the VectorBloc system in a quarter of the time that it would have otherwise taken," Bowron stresses.

"We were able to move from the development of concepts to cut files for production of prototype tooling and products in just two weeks, and, in addition to shortening the development cycle, SOLIDWORKS solutions also helped us reduce costs dramatically," Bowron continues. "For example, we were able to save \$100,000 in tooling and initial production costs by optimizing our designs using SOLIDWORKS FEA [Simulation] capabilities."

3D DESIGN SIMULATION, VISUALIZATION DRIVES COMMUNICATION

Vector Praxis relied on SOLIDWORKS Simulation tools to validate the performance of the VectorBloc system as well as to visualize and communicate FEA results to clients and partners. "With SOLIDWORKS Simulation, we conducted numerous stress/strain and deflection analyses to help us optimize the VectorBloc design," Bowron recalls. "That required a good deal of filleting work, augmenting the geometry in areas of high stress and carving off materials where stresses were low—a process that was faster because of the integration of SOLIDWORKS modeling and simulation applications."

"After the simulations were complete, we used SOLIDWORKS eDrawings® files to clearly communicate the optimized designs to our shop, outside tooling suppliers, and our client's engineers," Bowron says. "Keeping the maintenance on all of our licenses up-to-date is also important because it enables everyone on the team to be on the same version of a design rather than having to work with variants, which saves time and improves quality."

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