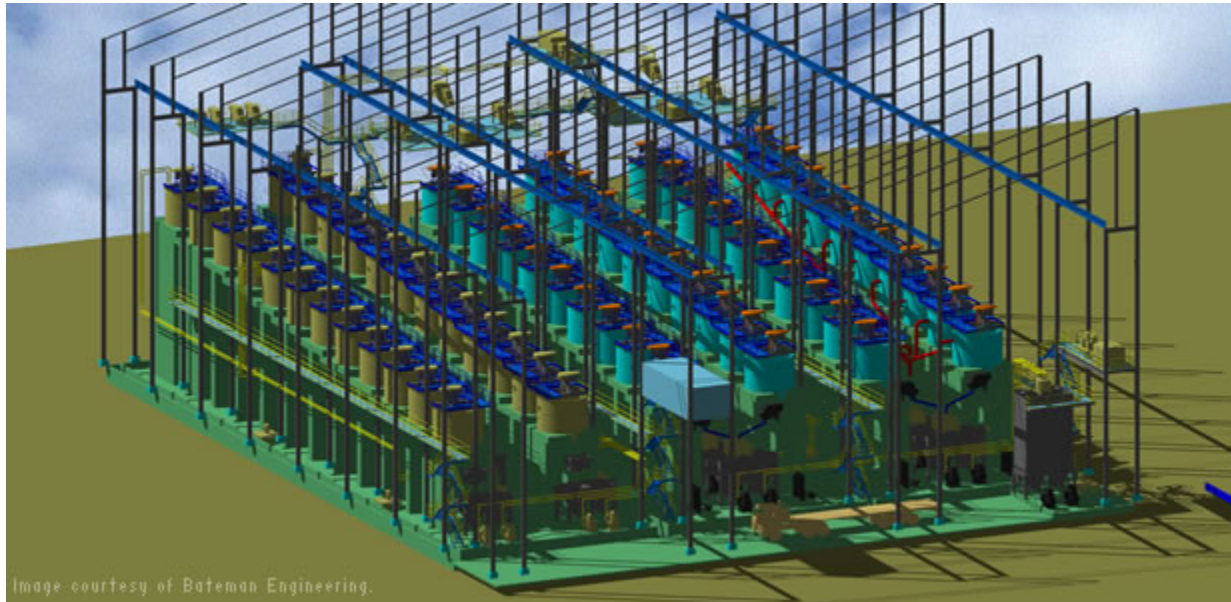


Converting Natural Resources

Case Study: Process plant design team in South Africa incorporates 3D process plant modeling and more intelligent P&ID creation into its workflow.



"AutoCAD Plant 3D software enables us to exchange information among a 3D process model, P&IDs, isometrics, and orthographic deliverables. AutoCAD P&ID software helps streamline and automate basic P&ID tasks. Now, we can better coordinate input from multiple engineering disciplines using a single plant model. Our familiarity with AutoCAD helped us get started in a little over two days."

-Michael Denholm, Design Office and CAE Systems Manager, Bateman Engineering

Project Summary

One of the world's leaders in mineral and metal process engineering, Bateman Engineering (Bateman) helps companies around the globe convert natural resources into essential, marketable products. The firm prides itself on engineering state-of-the-art solutions to its clients' processing challenges—safely, on time, and within budget. That means the firm's engineers must keep up with the latest processing techniques and technology. It also requires that Bateman's design tools support fast-paced projects. The firm's process plant design team in South Africa recently turned to [AutoCAD® Plant 3D](#), [AutoCAD® P&ID](#), and [Autodesk® Navisworks®](#) software to execute a feasibility study and help establish the best way to add a new flotation process line at an existing client's phosphorus plant in the country's Limpopo

province. Using AutoCAD Plant 3D, AutoCAD P&ID, and Autodesk Navisworks software on the project, Bateman has been able to:

- Incorporate 3D process models and more intelligent P&ID data into its design process
- Generate material lists and isometrics faster
- Spot and resolve clashes more easily
- Gain a competitive advantage by sharing process models with clients

The Challenge

Complex process designs require the active participation of many disciplines—from mechanical, piping, civil, structural, and electrical engineers to instrumentation and chemical processing experts. Whether they are finalizing detailed designs or helping a client determine a project's feasibility, Bateman needs to integrate a staggering amount of engineering know-how into its designs. Seemingly small clashes between piping and structural elements could lead to significant expense and rework during construction, making up-front accuracy essential. Yet in its clients' highly competitive industries, aggressive project schedules leave little room for time-consuming project coordination methods.

The Solution

For many years, the engineers at Bateman relied on [AutoCAD®](#) software as their core design tool. While the software provided a solid common design platform for Bateman's multidisciplinary teams, the firm wanted to incorporate 3D process plant modeling and more intelligent P&ID creation into its workflow. In AutoCAD Plant 3D and AutoCAD P&ID software, Bateman stuck with the familiar AutoCAD interface and functionality—and gained enhanced design capabilities.

Taking a Different Approach

The preliminary feasibility study for the new flotation process in Limpopo launched at the perfect time to serve as Bateman's first AutoCAD Plant 3D model-based project. The flotation process, planned as an enhancement and expansion for an existing phosphate plant, needed to be integrated into an existing facility. The flotation process will extract phosphates for use in fertilizer.

Often, these types of early stage studies consist only of very high-level process designs and facility sketches. Lacking detail, much of the initial work cannot be heavily leveraged in the later stages of the project. Bateman decided to use its new AutoCAD Plant 3D software to take a different approach.

Faster P&IDs

Bateman chose to enhance the study with initial P&ID detail developed in AutoCAD P&ID software. The software enabled the design team to draft P&IDs that were linked to underlying equipment data and the firm's layout standards. Using more intelligent data made it easier to automate tasks, including attaching components to lines and maintaining flow direction.

Delivering the “Wow Factor” in 3D

When Bateman delivered the initial process study to the client, the model-based approach shined. Mr. Denholm reports: “There’s a ‘wow factor’ in delivering a 3D process model instead of 2D layouts. The 3D model enabled the client to more easily visualize how the process would look in the facility.”

The Result

Inspired by the success of the flotation study, Bateman anticipates that AutoCAD Plant 3D, AutoCAD P&ID, and Autodesk Navisworks software will play a central role in the firm's workflow long into the future. “With a process model, the whole team can visualize what they are doing as they do it,” says Mr. Denholm. “We can collaborate faster, and it's easier to address issues like clashes earlier in the process. But it's not just about resolving problems before construction—it's about not creating issues in the first place. You can save time as you deliver a quality design. And just as importantly, visualizing the model with Autodesk Navisworks helps clients clearly see that the design will deliver what they want.”