

## Shaun Severin Steers Water Industry into Digital Space

*Federated Models and Digital Twins Aid Water-related Engineering Projects in Design—and Will Soon Guide Operations*

A leading engineering consulting firm focused on the environmental sector, Brown and Caldwell has chosen to advance their BIM capabilities—and Shaun Severin, director of building information and modeling, is leading the charge. He not only understands the benefits of BIM technology, but he also knows how it is best used in water and wastewater treatment and distribution projects. With more than 35 years' experience working in the water industry, Severin has focused much of his career on how the industry can best expand the use of BIM applications and embrace digital technology.

A water treatment facility in Brighton, Colorado is the first fully integrated project ever carried out by Brown and Caldwell. The project team used Bentley Systems' OpenPlant, an open, scalable, and interoperable plant design and modeling application that writes directly to the PlantSight digital twin, with no importing or exporting necessary. Severin oversaw the multidiscipline BIM team on this project, who review and update their work from disparate models through the digital twin.

### Learning Engineering Young

Severin attended a specialized high school in Denver, Colorado where he was able to take courses centered around architecture and engineering. While in college, he worked in construction for a short period of time, and then he was hired by the engineering firm Black and Veatch as a draftsman. The company moved him to San Diego to operate a plant and manage production, and Severin began engineering classes at San Diego Mesa College.

“I knew water was where I wanted to be,” said Severin, who has worked as a design and construction manager on large water and wastewater projects at various companies.

His most notable role was as a design manager on a wastewater treatment plant expansion in San Diego while working at Carollo Engineers, a water-related engineering firm, where he spent over a decade. The project included the design and construction of the largest digester west of the Mississippi River at the time, and it was located on oceanside cliffs. Severin worked on the project for six years, following it through to construction management.

“I did all of it. So, that’s probably my favorite job because I was so deeply involved with it at every level,” Severin said. Carried out in the mid-1990s, Bentley Systems’ MicroStation was used on the project.

An important milestone in his career, the partners of Carollo Engineers asked Severin to write a report describing which engineering design applications were best for moving the firm into 3D design visualizations. Severin recommended Bentley Systems software and began working with Bentley to develop the appropriate products for the firm to successfully tackle 3D design projects.

## **Bringing Digital to Brown and Caldwell**

Now, at Brown and Caldwell, Severin is responsible for managing all BIM aspects of the wastewater projects. He is working to position Brown and Caldwell so that they are prepared for the direction technology takes in the future. He is also working with and expanding the use of Bentley applications and digital twins. Brown and Caldwell wanted to use software that was forward-thinking, but also needed a platform that was system-agnostic because their customers often require deliverables in a variety of design software.

Water-related process facilities have been slow to adopt digital technologies, according to Severin. However, the pace of “going digital” is accelerating.

“Now we’re hearing, ‘I want to have a 4D or 5D construction project.’ So, the industry in general is starting to catch up,” Severin said. “In the past, quickly for water maybe wasn’t so quick, but I think it’s accelerating now. Currently, I’ve seen digital twins in the water industry used by engineering firms for drawing markups, model review, walkthroughs for operator input, and workshops with the owner. For the plant operation, the plant’s data is stored within the model and detailed reports are handed over for operational readiness and faster ramp up.

Looking to the future, Brown and Caldwell wants to deliver complete digital twins to their customers to manage the assets once in operation. We can help the facilities to manage the digital twins.

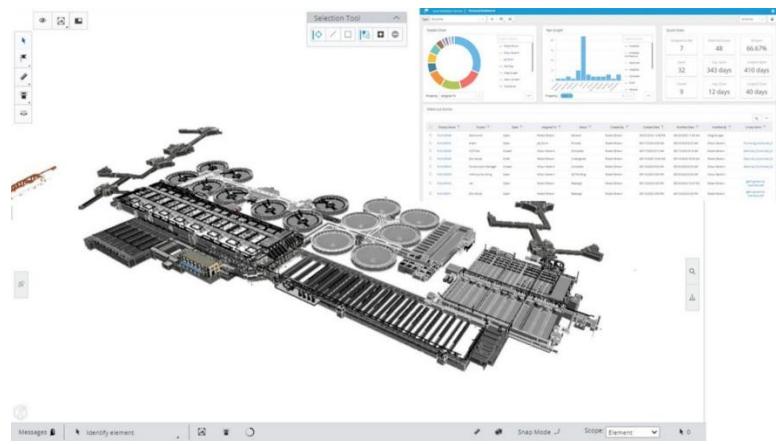
Now that most water facilities have incorporated internet of things (IoT), all of the operational data can be made visible in the digital twin and the operator can use reliability-centered maintenance (RCM) to ensure the facility is operating correctly. The digital twin makes it easy to view operating context and gain insights to equipment condition degradation and trends and take action from real-time data.

“PlantSight is sort of the glue throughout the lifecycle of the asset,” Severin said. “We couldn’t design without it. PlantSight is the information hub, and we tie everything else to it.”

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## Image



### Caption:

Shaun Severin, director of building information modeling with Brown and Caldwell, is responsible for managing all BIM aspects of the wastewater projects.

*Image courtesy of Brown and Caldwell*