



Transform treatment plant design and project delivery

Engineering your water infrastructure with digital twins

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The critical nature of water infrastructure

Cities and communities rely on systems that ensure water is properly treated and accessible. Water and wastewater facilities, along with their operators, face pressures from aging assets, climate change, population growth, urbanization, and rising regulatory demands. Many critical water infrastructure assets are nearing the end of their service life. Most urgently,

they are prone to breaks and collapses, which could result in significant efficiency and water losses, sewer overflows, and public health and environmental concerns, requiring swift upgrades and replacement. How can you solve pressing challenges like these?



Water security



Rapid urbanization



Aging infrastructure



Extreme climate events



Carbon footprint reduction



Water stewardship



Regulatory compliance



How Bentley treatment plant solutions can help

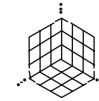
Bentley has a 40-year legacy of innovation in infrastructure engineering. With a global footprint and a commitment to sustainability, Bentley delivers solutions that transform how treatment plants are designed, built, and upgraded. From initial concept to seamless digital handover, the solutions ensure that every phase is optimized for performance, sustainability, and cost-efficiency.

- The **Treatment Plant Design Solution** can help engineers cut design time by half by connecting design and engineering with intelligent digital twins. Users can improve design quality, streamline the review process, and reduce rework.
- The **Treatment Plant Project Delivery Solution** dramatically improves the construction and handover process. Engineers can federate 2D, 3D, and 4D data to perform planning, scheduling, and productivity tracking.





Benefits for your work processes



In design

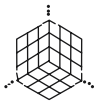
- Enhance design collaboration with federated data environments
- Minimize costs and rework
- Improve design quality
- Speed design time
- Automate tedious tasks
- Make better decisions by accessing models and documents in real time



In project delivery

- Reduce costs and rework
- Save construction time with optimized scheduling
- Enable digital handover
- Improve stakeholder engagement
- Reduce risk and improve safety during construction

Capabilities that produce results



In design

- Plant-focused design
- Lifecycle information management
- Clash detection
- Design review
- 3D plant data integration
- Interoperability



In project delivery

- Multidisciplinary collaboration
- Project information management
- Project delivery management
- 4D planning and simulation
- Constructability review and digital rehearsals



Case study

Saving time on a wastewater treatment plant expansion

Jacobs Engineering

Buford, Georgia, United States

Project playbook

iTwin® Capture, MicroStation®, OpenBuildings®, OpenPlant®, OpenRoads™ Designer, Pointools™, ProjectWise®

Jacobs Engineering designed a complex retrofit project and faced challenges coordinating a remote team, compounded by the limited functionality of existing outdated as-built models. They used a comprehensive reality modeling solution and a connected data environment to acquire accurate and georeferenced 3D plant data to integrate the up-to-date models into the design process.

A cloud-based reality mesh of the existing conditions allowed them to share the accurate and up-to-date plant model among a globally dispersed team. They were able to consolidate the newly captured information with existing models to create an accurate representation of the current plant. As a result, they quickly resolved more than 20 design issues that would have taken numerous site visits, reducing design costs by 10%. Overall, they saved 300 hours in modeling.

[Learn more](#)**300**

hours saved in modeling time

10%

design costs saved

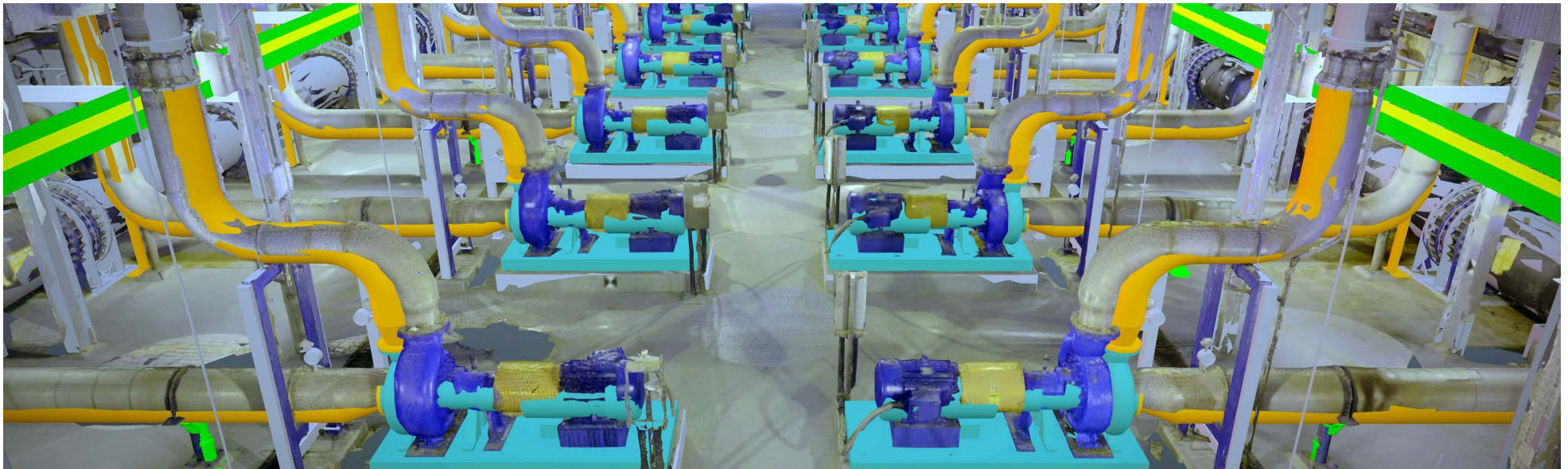


Image courtesy of Jacobs

Case study

Optimizing design for a desalination plant

Beijing Shougang International Engineering Technology Co., Ltd., Wanhua Chemical (Penglai) Co., Ltd.,
Yantai, Shandong, China

Project playbook: AutoPIPE®, Bentley LumenRT™, Bentley Raceway and Cable Management™, MicroStation, OpenFlows™, OpenPlant, OpenRoads™, ProjectWise, SYNCHRO™

A 300,000 ton-per-day seawater desalination project supports an environmentally friendly, low-carbon chemical park and alleviates freshwater resource constraints, providing Penglai with 90 million tons per year of freshwater resources. The seashore project faced poor geological conditions, compounded by complex desalination processes and equipment, along with data integration and exchange challenges.

With a collaborative BIM environment, they modeled the plant and equipment. The team simulated and analyzed water hammer and pipeline stress to ensure the safety and reliability of the system. Working in a connected digital platform, they identified and resolved 247 design conflicts. The team achieved a 70% improvement in design efficiency and reduced design time by more than 50%.

[Learn more](#)**70%**

improvement in
design efficiency

50%

reduction in
design time

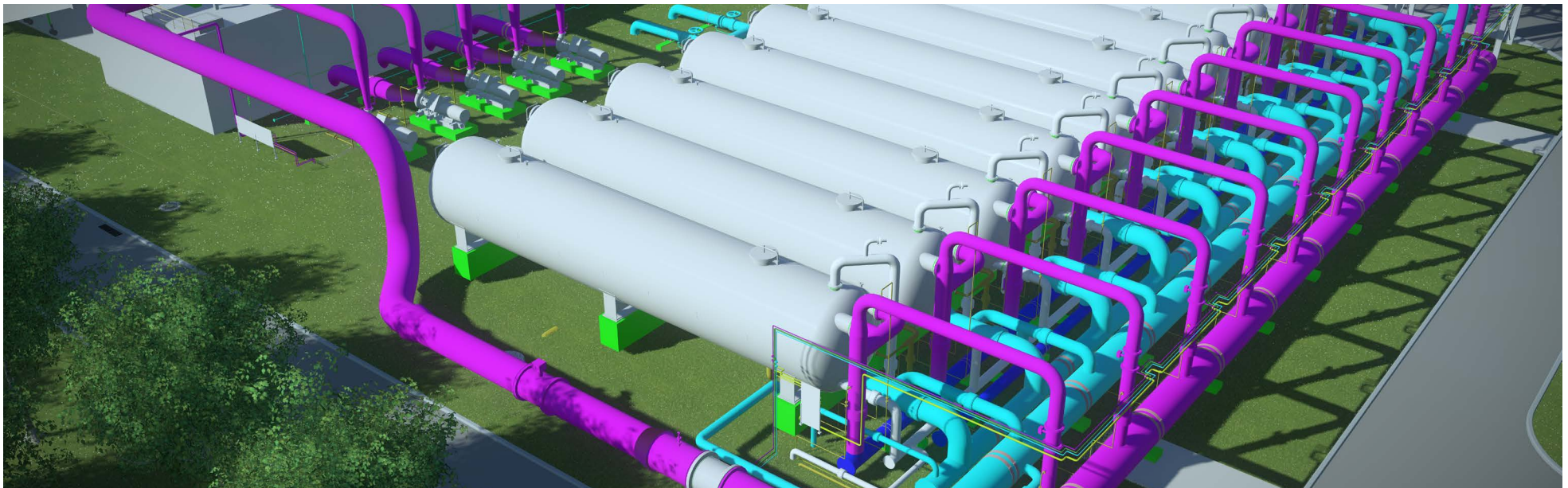


Image courtesy of Beijing Shougang International Engineering Technology Co., Ltd.

Case study

Democratizing data for a water reclamation plant

UES Holdings Pte Ltd
Singapore

Project playbook

OpenBuildings, OpenPlant, ProjectWise, SYNCHRO

[Learn more](#)

As part of efforts to meet Singapore's water needs, the country is developing the Deep Tunnel Sewerage System Phase 2, which includes the Tuas Water Reclamation Plant, a facility that can treat 800,000 cubic meters of water per day, along with a 30-kilometer south tunnel, 70 kilometers of link sewers, and 12 kilometers of deep-sea outfall. UES Holdings worked as the main contractor and subcontractor for the project, but needed to ensure their work was sustainable, energy-efficient, and resilient in the face of climate change.

The team created a digital twin of the project. They first modeled project elements, incorporating all equipment information into the 3D models. Next, they simulated the construction process. They managed 16 contract packages using the iTwin platform. The team cut modeling federation time by 75% and reduced design and contract times by 50%.

75%

faster modeling
federation time

50%

faster design
and contract times

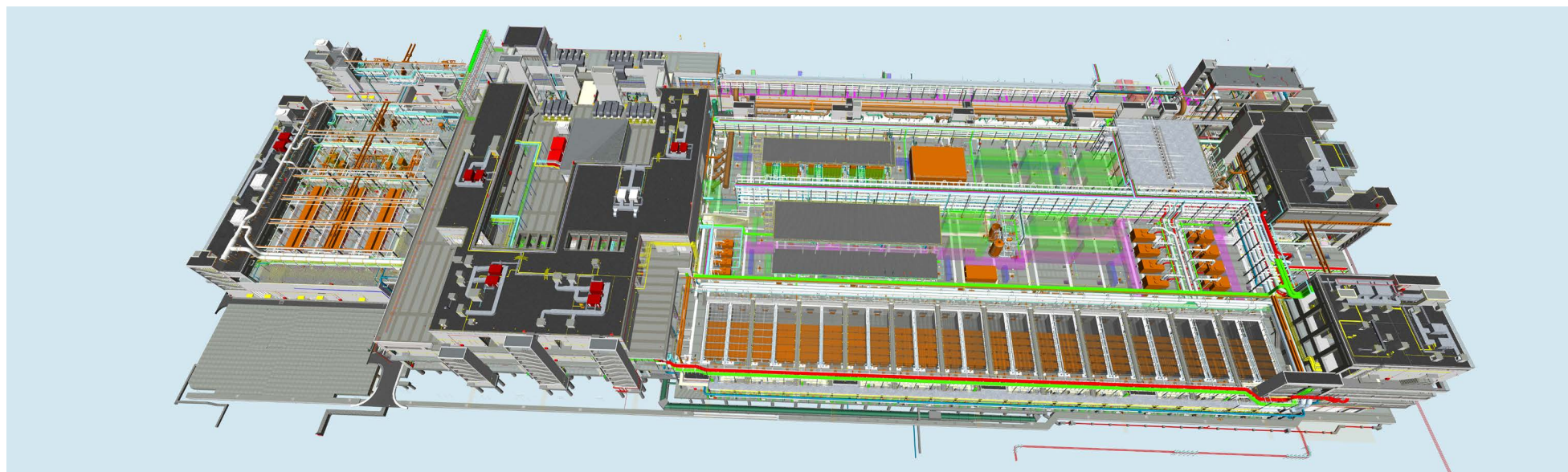


Image courtesy of UES Holdings Pte Ltd

Case study

Cutting construction costs for a wastewater treatment plant upgrade

Project Controls Cubed LLC

Sacramento, California, United States

Project playbook

Bentley LumenRT, iTwin Capture, OpenRoads, SYNCHRO

[Learn more](#)

EchoWater upgrades infrastructure to facilitate treatment of approximately 135 million gallons of wastewater per day, providing a safe and reliable supply of treated water that will be used for recycled water purposes. Consisting of 22 individual projects centered around constructing a sprawling complex for removing 99% of ammonia and 89% of nitrogen, planning and managing the design of these simultaneous components on an active wastewater treatment facility presented significant challenges.

The team used construction solutions and a digital twin, anticipating and mitigating potential obstacles and shutdowns while providing optimal and timely situational awareness of cost and schedule performance. Working in a connected digital visual environment, they completed EchoWater USD 400 million under budget, saving ratepayers more than half a billion dollars. The project's cost savings are being used to fund California's Harvest Water program, providing recycled clean water to the Central Valley's agricultural industry.

USD 400M

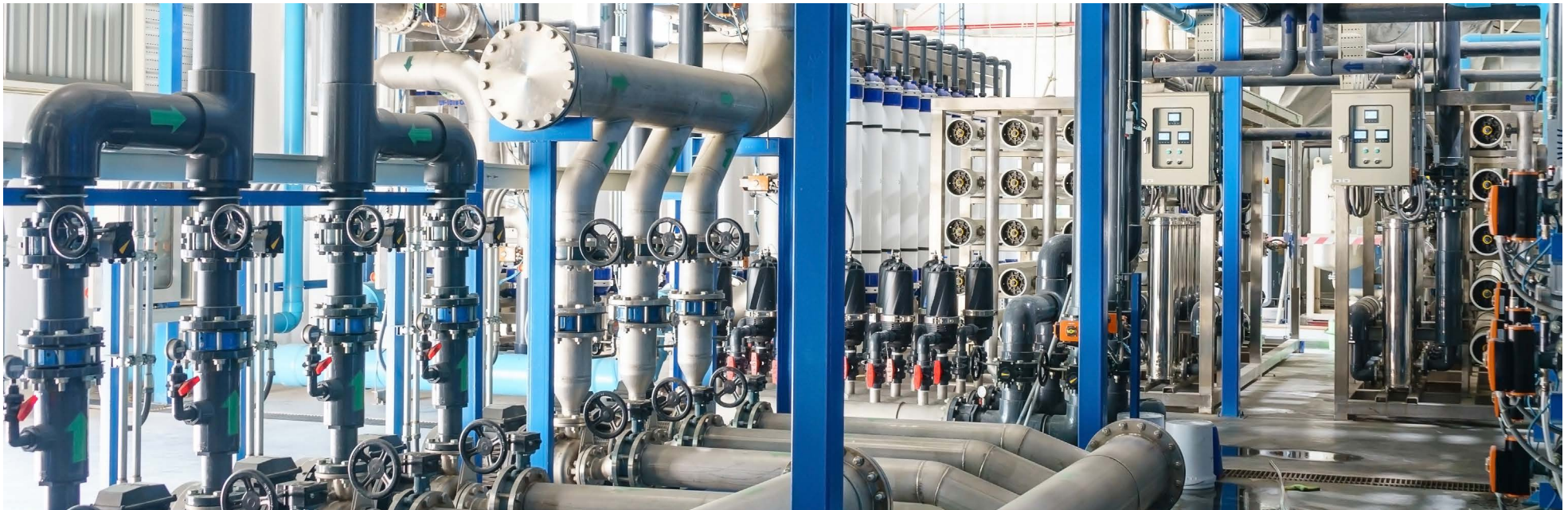
 under budget

Image courtesy of Project Controls Cubed LLC

Why choose the Bentley treatment plant design solution?

Bentley provides software chosen by millions of design engineers. With the Treatment Plant Design Solution, you can integrate design and engineering processes with iTwin-based tools to enhance collaboration, minimize rework, and elevate the overall quality of your design. Bentley provides the highest level of domain expertise and digital infrastructure currently available to transform the production of treatment plant designs.

Bentley is the only company that provides detailed 3D modeling and comprehensive engineering capabilities along with end-to-end information and data management solutions. Take advantage of unparalleled platform flexibility and advanced interoperability. Bentley's offerings transcend disciplinary and geographical boundaries, facilitating streamlined and consistent collaboration across applications and providing uniform advanced BIM and design review functionalities.



Core products



ProjectWise®

Improve collaboration:

Improve the productivity of your engineering team with collaborative software for enhanced digital design powered by iTwin.



OpenPlant® Modeler

Minimize costs and rework:

Visualize and optimize the construction process for better planning and resource allocation.



OpenBuildings® Designer

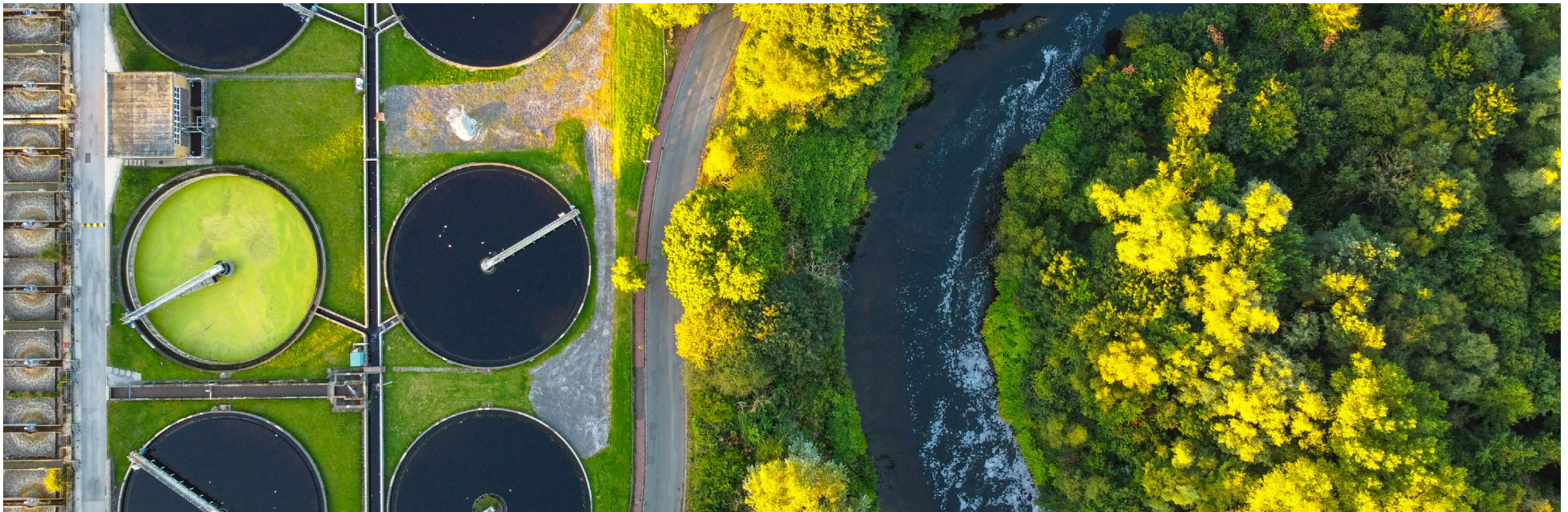
Speed design time:

Save time on your treatment facility designs with multidisciplinary building design software. Take advantage of BIM workflows to provide information-rich models for the design, analysis, simulation, and documentation of treatment buildings.

Why choose the Bentley treatment plant project delivery solution?

Enhanced with our market-leading 4D planning and simulation capabilities, the Treatment Plant Project Delivery Solution provides the most streamlined and effective workflow for managing the construction phase and creating a persistent digital twin environment, as well as providing the best possible foundation for a true digital handover at the beginning of the asset operations phase. Backed by Bentley's user-centric approach with global support and a thriving user community, you can trust that you are choosing the best partner for your success.

Bentley is the only solution vendor in the market who can provide detailed 3D and 4D modeling capabilities alongside end-to-end information and data management solutions. Benefit from platform flexibility with advanced interoperability capabilities. Bentley solutions break down the barriers between disciplines and geographies, enabling streamlined and consistent collaboration, regardless of application, providing powerful BIM and design review capabilities across the board.



Core products



Reduce costs and rework:

Minimize the construction errors that come from using multiple sources of truth. Align your project on a common intelligent digital twin to avoid costly rework.



Save construction time:

Enhance construction planning and resource allocation through advanced visualization and optimization.

Advancing water treatment plant infrastructure

Transform your treatment plant design and project delivery. With proven tools that support every phase of the lifecycle, Bentley enables you to design smarter, build more efficiently, and achieve your sustainability goals.

[Learn more](#)

