Bentley
Sustaining Infrastructure



2014 **INFRASTRUCTURE** YEARBOOK

The Extraordinary Infrastructure Projects of the 2014 *Be Inspired* Awards

Bentley's mission is to provide innovative software and services for the enterprises and professionals who design, build, and operate the world's infrastructure – sustaining the global economy and environment for improved quality of life.



The *2014 Infrastructure Yearbook* is a Bentley Systems, Incorporated publication that showcases the extraordinary work of Bentley users sustaining the world's infrastructure. For additional print copies, go to **www.bentley.com/2014yearbook**.

For information about how to enter your innovative project for consideration in the next *Be Inspired* Awards program or for additional information about this program, visit **www.bentley.com/beinspired**.

Online Versions

Digital versions of *Be Inspired* Awards publications are available online at **www.bentley.com/yearininfrastructure**. Choose to view a specific issue or search within each issue using terms, titles, or keywords.

Also browse Bentley's *Be Inspired* Project Portfolios at **www.bentley.com/projects**, which feature the winners and finalists in Bentley's annual *Be Inspired* Awards program. Through these multimedia portfolios of exemplary project achievements, Bentley shares innovative best practices with the architects, engineers, constructors, geospatial professionals, and owner-operators who sustain the world's infrastructure.

Bentley® Sustaining Infrastructure

Bentley Institute

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Innovation and Inspiration

Bentley's *2014 Infrastructure Yearbook* recognizes and records some of the most extraordinary accomplishments of Bentley users designing, constructing, and operating the world's infrastructure. Its content is sourced from the nominations in the annual *Be Inspired* Awards program, with this 2014 edition comprising highlights of more than 250 remarkable projects.

The respective infrastructure teams responsible for each achieved better performing projects and better performing infrastructure through their application of innovative strategies for advancing BIM. Fundamental to these strategies is an increased breadth of information mobility and increased depth of information modeling. The net result was the efficient and cost-effective creation and/or operation of intelligent infrastructure that is safer to operate, features greater resilience to disasters, and is more energy efficient and sustainable. These higher quality assets further yield greater returns for their owners.

The projects reflect the broad spectrum of today's infrastructure challenges – from a new bridge across the Hudson River in New York, U.S.A., featuring twin tower cable-stayed main spans with 1,200-foot center spans, to a new authoritative digital referencing framework in Dublin, Ireland, that allows data users to accurately integrate and use multiple data sources for improved analysis and decision making, to the design of an LPG import and storage terminal in Saldanha Bay that is part of the South African Government's Department of Energy Strategy to supply LPG to communities across the country. Each is a testament to the ingenuity of architects, engineers, constructors, geospatial professionals, and owner-operators in leveraging technology and best practices to improve quality of life around the globe.

One project this year added a brand new dimension to the field of infrastructure in its design and construction of the Five-hundred-meter Aperture Spherical Radio Telescope (FAST). This largest single aperture telescope on Earth wouldn't have been possible without the world-class design and construction processes used to design and build this highly complex infrastructure asset that will expand our knowledge of the universe.

The *2014 Infrastructure Yearbook* is Bentley's tribute to the year's most inspiring infrastructure projects and to the professionals who have the talent, imagination, and dedication to bring them to fruition.

The *Year in Infrastructure 2014* Conference

November 4–6, 2014 | Hilton London Metropole | London, UK

This global gathering of leading executives in the world of infrastructure design, construction, and operations is unlike any other. Attendees had an opportunity to hear from thought leaders in the industry, engage in interactive sessions that explored the intersection of technology and business drivers, and see what technologies and next practices will shape the future of infrastructure delivery. In addition to keynotes from industry and Bentley executives, this year's powerful lineup featured close to 70 guest speakers, including Jon Arnold (Microsoft), Harvey Bernstein (McGraw Hill Construction), William Gale (Gas Technology Institute), Richard Lane (U.K. BIM Task Group and Creonova Consulting Ltd), David Philp (Mace, HM Government BIM Task Group), Jan Shumate (Eastman Chemical Company), Gordan L Smith (AngloAmerican-Platinum), Martin Swaine (Shell Oil Company), John Wishart (Lloyd's Register Energy), and Dr. Paul Zanelli (Transport Systems Catapult).

Guest Keynote Speakers



Andrew McNaughton | Chief Engineer and Technical Director, HS2 Ltd.

Speaking on the development of HS2 in the U.K., Andrew McNaughton said in his engaging presentation that this project is about enabling U.K. cities to work closer together as an economic powerhouse, and about bringing people together because "that's what makes things happen." Why BIM? McNaughton said that BIM is the only approach that addresses the whole life system, from designing and constructing HS2 virtually, to operating and maintaining it virtually, to renewing it virtually, and to adapting it virtually for at least the next 150 years.



Ed Merrow | Founder and President, Independent Project Analysis, Inc.

In his insightful presentation on capital projects, Ed Merrow said that project failures almost never start in the field. They typically fail due to errors in the development, flow, or sequencing of information early on in the project. To help infrastructure organizations prevent these errors and improve project outcomes, Merrow walked attendees through the three information streams in projects – the basic data stream, business shaping stream, and front-end loading and engineering stream or project stream.

Bentley Keynote Speakers



CEO Greg Bentley

Greg Bentley highlighted this year's "Effective Strategies for Advancing BIM" as identified by the 2014 *Be Inspired* Awards nominations. These strategies result in better performing assets through an increased depth of information modeling and better performing projects through an increased breadth of information mobility. The strategies include Comprehensive BIM Playbooks, Intrinsic Geo-context, Virtualization of Talent, Delivering Visibility (via i-models), and Progressive Information Mobility. He also noted the "Emerging Strategies for Advancing BIM," including Reality Modeling, Construction Modeling, and Asset Performance Modeling.



SVP Bhupinder Singh

Bhupinder Singh discussed the CONNECT Edition, Bentley's new generation of "software at your service" for sustaining infrastructure. The CONNECT Edition, he said, supports a hybrid computing environment for comprehensive project delivery. Its common environment, comprising a common project environment, modeling environment, deliverables environment, data environment, and performance environment, empowers Bentley users to attain the full potential of BIM advancements for project delivery.



Founder and CTO Keith Bentley

Keith Bentley provided an insightful look at the waves of hardware innovation – from PCs to personal workstations, the Internet, and more – that helped drive software innovations over the course of Bentley Systems' first 30 years. He also addressed the current waves of innovation, including what he calls "servers for hire" and expanded wireless availability, that are driving new and better software solutions to infrastructure project and operations challenges – through, for example, increased information mobility. He concluded with a look at the company's next innovation priorities, which include fusing the modeled world and physical world.

Forums

The Building Forum presentations included business requirements for BIM, the benefits of multi-discipline design collaboration and knowledge sharing, and innovations in construction management.

The Rail and Road Forum focused on improving productivity, increasing efficiencies, reducing risks, and adding value. It also covered the industry's best and next practices and highlighted new technologies.

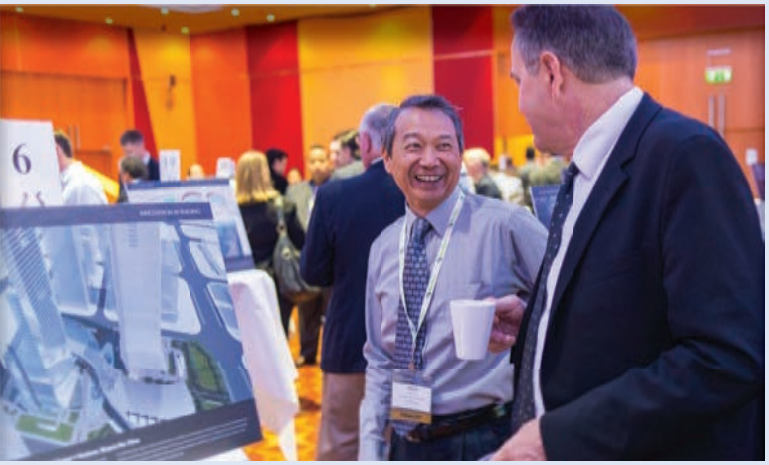


The Oil, Gas, Chemical, and Mining Forum explored new methods and technologies to improve project and asset performance on new capital projects and ongoing operations.

The EPC and A/E Forum addressed the project lifecycle and the impact of cloud and mobile technology. Industry leaders explained how their organizations are improving project delivery and enhancing project performance.

The Utilities Forum focused on the impact of cloud technology on utility workflows, new technologies to help meet the challenges of subsurface utilities, best practices in engineering collaboration, and more.

Visions for the Future discussed opportunities for improving construction productivity and sharing data between BIM and SIM. It also covered deep intelligent analytics, new 3D capture methods, and more.



Executive Invitation-only Summits

The Project Delivery Summit

Industry leaders and subject matter experts from over 25 high-profile companies attended this two-day summit to discuss project delivery trends, best-practices, and next-practice innovations. Summit delegates shared practical insights and discussed strategies to address the common challenges and opportunities in managing the complexities of capital project execution.

The Infrastructure Asset Performance Summit

This summit included two days of facilitated discussions with senior executives from renowned organizations who are tackling the challenges associated with owning, managing, operating and maintaining complex infrastructure assets. Participants shared valuable insights and developed strategies for addressing common challenges and opportunities in managing infrastructure assets. Key topic discussions centered on ISO 55000, the CAPEX-OPEX divide, and the threshold of value versus risk.

The *Be Inspired* Awards

The *Be Inspired* Awards program recognizes outstanding achievement in infrastructure. At The *Year in Infrastructure 2014* Conference, the awards finalists presented the challenges and innovations of their inspiring projects before the jurors, attending infrastructure thought leaders, and 100+ journalists covering the event.

The following night, during the *Be Inspired* Awards ceremony and gala, the winners were recognized for their extraordinary contributions to sustaining infrastructure and improving quality of life around the globe.

Media Day

This invitation-only event brought over 100 members of leading international online and print media outlets together for a briefing on key business and technology trends in the design, construction, and operations of infrastructure. The briefing materials included press releases and Bentley's 2014 Advancement Insights – an annual reporting of innovative technology, best practices, and project strategies for advancing infrastructure design, delivery, and performance. To access:



Press Releases, visit
www.Bentley.com/Pressroom

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www.Bentley.com/AdvancementInsights

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Table of Contents

About the 2014 *Be Inspired* Awards 7

Special Recognition Award Winners
- 10 Advancing Asset Lifecycle Information Management
- 12 Advancing Comprehensive BIM "Playbooks"
- 13 Advancing Dimensions in Infrastructure
- 14 Advancing Information Technology
- 15 Advancing Urban Infrastructure
- 16 Effective Strategies in Construction Modeling
- 17 Educator of the Year

2014 *Be Inspired* Awards
- 19 Innovation in Asset Performance
- 25 Innovation in Bridges
- 33 Innovation in Building
- 47 Innovation in Construction
- 55 Innovation in Government
- 65 Innovation in Land Development and Management
- 71 Innovation in Megaprojects
- 77 Innovation in Mining and Metals
- 83 Innovation in Offshore Engineering
- 101 Innovation in Power Generation
- 109 Innovation in Process Manufacturing
- 117 Innovation in Project Performance
- 123 Innovation in Rail and Transit
- 131 Innovation in Roads
- 147 Innovation in Structural Engineering
- 159 Innovation in Utilities and Communications Networks
- 171 Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis
- 187 Innovation in Water or Wastewater Treatment Plants

2014 *Be Inspired* Awards Jurors 191

Index
- 200 Alphabetical by Organization
- 208 Project Location by Country
- 218 Alphabetical by Category





About the 2014 *Be Inspired* Awards

The annual *Be Inspired* Awards program brings together infrastructure professionals from around the globe. Its goal is twofold: to advance innovation and best practices in design, engineering, construction, operations, and project delivery, and to promote the extraordinary work of the organizations that help sustain the world's infrastructure.

The *Be Inspired* Awards has recognized more than 2,500 of the world's most outstanding infrastructure projects since its inception in 2004. The projects nominated for the *Be Inspired* Awards are submitted by Bentley's global community of users. This year, nine independent panels of jurors, comprising distinguished industry experts, selected the 54 finalists and the *Be Inspired* Special Recognition Awards candidates from nominations submitted by organizations in 49 countries.

At Bentley's *Year in Infrastructure 2014* Conference in London, representatives of the *Be Inspired* Awards finalists presented their projects before the jurors – for their consideration in the final tally – as well as the other industry executives and members of the media in attendance. The winners were announced during the highly anticipated *Be Inspired* Awards ceremony.

Winners of the *Be Inspired* Special Recognition Awards also received their awards during the ceremony. The candidates for these awards were selected by the jurors from the top finalist projects as well as other exemplary nominations. This selection was based on the projects' and/or organizations' uniquely innovative and visionary achievements that transcend the narrower focus of the standing *Be Inspired* Awards categories. The nominees were then reviewed by a panel of Bentley executives, who evaluated them based on the criteria established for each award.

All of this year's nominated projects are presented in the *2014 Infrastructure Yearbook*. By showcasing these outstanding achievements in sustaining infrastructure, Bentley shares important innovations in best practices among the many organizations and professionals around the globe who make infrastructure projects possible. Searchable digital versions of *Be Inspired* Awards publications are available online at **www.bentley.com/yearininfrastructure**, and Bentley's *Be Inspired* Project Portfolios are available at **www.bentley.com/projects**. In addition, the recorded presentations of the winning and finalist projects can be viewed at **www.bentley.com/projects2014**.


Bentley
THE
YEAR IN
INFRASTRUCTURE 2014
CONFERENCE
November 4 – 6, 2014 | Hilton London Metropole | London, UK
Bentley/Trimble Strategic
Alliance Update

Special Recognition Award Winners



Advancing Asset Lifecycle Information Management

This award is given to organizations that best exemplify next practices in managing infrastructure operations throughout the asset lifecycle at an exceptionally high standard, improving change management, and enhancing stakeholder access to information. On top of this, they have improved process efficiency, increased productivity, and added safety.

Advancing Comprehensive BIM "Playbooks"

This award is given to the project that has been exemplary in taking advantage of Bentley's comprehensive playbook of applications.

Attaining Return on Innovation

The award for this category is given to an organization that best exemplifies innovation by utilizing technology and creative workflows to create value and deliver better-performing infrastructure with demonstrated, quantifiable results.

Advancing Dimensions in Infrastructure

This award recognizes a project that demonstrates the critical role of infrastructure in facilitating advancements across the spectrum of human knowledge and technological innovation.

Advancing Information Technology

This award acknowledges a project that emphasizes how information technology can improve efficiency and productivity for infrastructure projects.

Advancing Urban Infrastructure

This award is given to the project that best illustrates the power of infrastructure to improve daily life, decrease congestion, and serve as an example for future urban planning.

Effective Strategies in Construction Modeling

This award recognizes the outstanding application of effective strategies that are changing the way we design, build, operate, and maintain today's and tomorrow's infrastructure.

Educator of the Year

An educator of the year demonstrates achievements that stand above those of his or her peers. In addition, he or she brings a passion for inspiring students to participate in the science and engineering fields, and sets the expectations for them to excel in their chosen profession, all while interlacing cutting-edge technologies and theories that ultimately enhance and sustain infrastructure.

The projects considered for Special Recognition were selected by the jurors of the *Be Inspired* Awards from the exemplary projects nominated in each category. They represent both excellence and innovation in a way that is emblematic of Bentley's mission of *Sustaining* Infrastructure. These achievements transcend the narrower focus of any individual category in the standing *Be Inspired* Awards. The Special Recognition jury then evaluates these submissions and recognizes those that most advance their field of infrastructure.

Special Recognition

Advancing Asset Lifecycle Information Management

WINNER

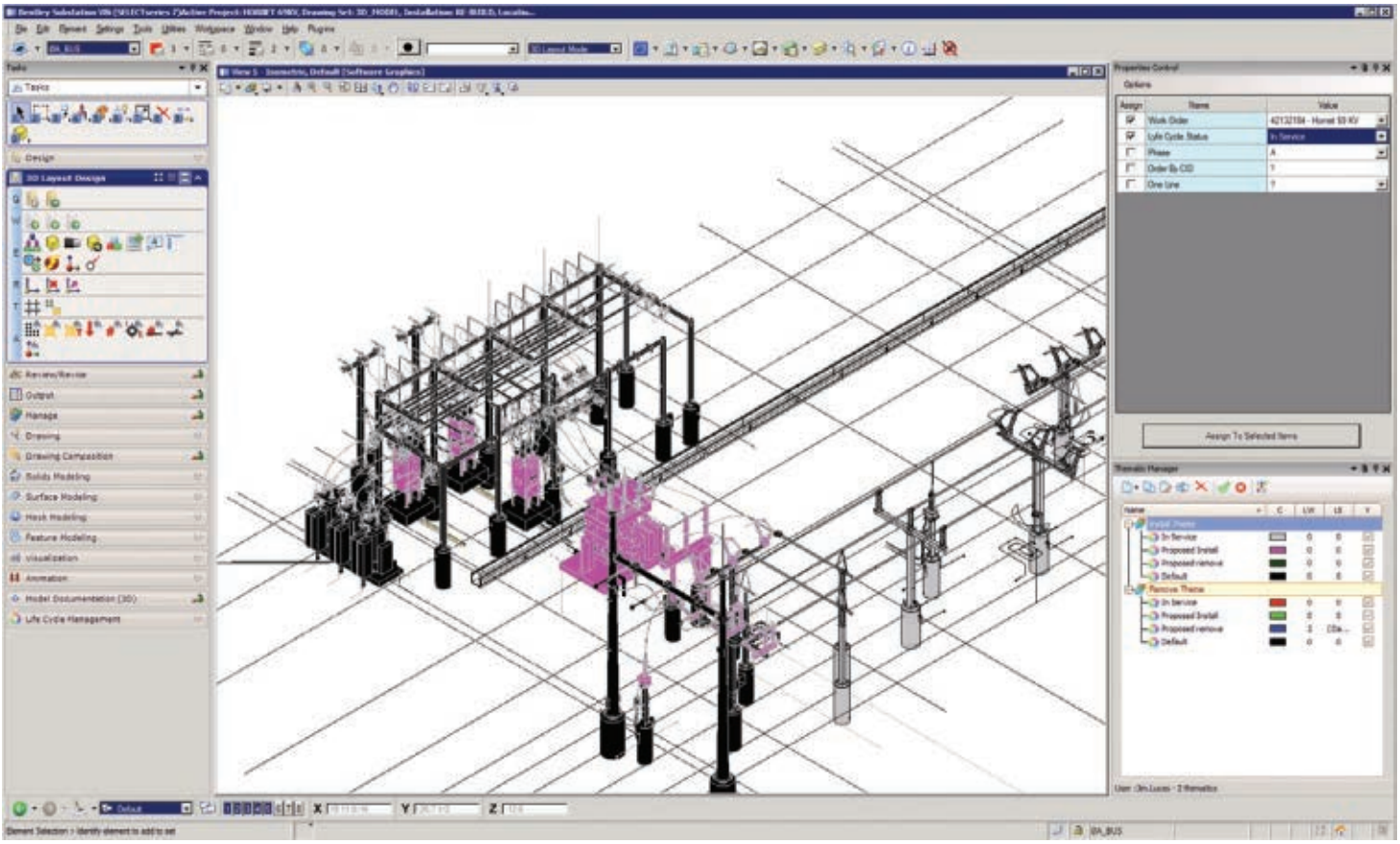
American Electric Power | Gahanna, Ohio, and Tulsa, Oklahoma, United States

Bentley Substation and eB Implementation

American Electric Power's substation design offices had diverged in its use of various processes, tools, and procedures. Information required for design was spread across multiple systems. This project provided an end-to-end integrated substation design process with supporting tools and automation, all while retaining out-of-the-box functionality and using configuration instead of customization.

By taking advantage of Bentley Substation's integrated set of capabilities combining intuitive 3D modeling, electrical design functionality, and automatic bills of materials and report generation, American Electric Power anticipates faster design cycles and improved collaboration across physical and electrical design disciplines. American Electric Power is also implementing Bentley's AssetWise capabilities to integrate Bentley Substation with existing systems that house data integral to the design processes.

AssetWise provided a foundation to integrate with American Electric Power's Work Management System and serves as a data hub for design. This not only allows data to be concentrated into a primary location for the designers, but also enables an interconnected dataflow into Bentley Substation and ProjectWise. In addition, American Electric Power introduced a lifecycle management component to support assignment of work orders and status on every object within a design. This enabled the reverse interconnected flow from Bentley Substation back to AssetWise and then into Work Management.



Special Recognition

Advancing Asset Lifecycle Information Management

WINNER

QGC Pty Limited | Gladstone, Queensland, Australia

The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project

QGC Pty Limited has developed the world's first facility that converts coal seam gas into liquefied natural gas (LNG). This AUD 20.4 billion undertaking is one of Australia's largest capital infrastructure projects. Its goal is to provide a sustainable solution to world demand for cleaner, more efficient energy. The two liquefaction units at the Gladstone, Australia, plant will produce a combined 8.5 million tons per year of LNG for Asia Pacific customers.

An early challenge for QGC was to track 700,000 pieces of equipment from 2,000 wells, 22 plant facilities, four water treatment plants, 750 kilometers of pipelines, and a liquefaction terminal. Each piece of equipment had approximately 20 key data attributes plus a unique tag number that referenced related assets, documents, and data. To access, manage, track, and maintain approximately 14 million items of information spread over 4,500 square kilometers, QGC developed a master tag registry and engineering data warehouse.

Engineering design data from multiple contractors across the Queensland Curtis LNG project is now converted into a common Bentley i-model format that can be easily accessed, improving collaboration as well as the transparency of data ownership and traceability of changes across the entire project. Since the master tag registry was used from inception, the data warehouse will be able to supply the commissioning team with critical information related to various systems, tags, and documents.



Special Recognition

Advancing Comprehensive BIM "Playbooks"

WINNER

HDR | Westchester, New York, United States

Tappan Zee Hudson River Crossing: The New NY Bridge

The New NY Bridge will cross the Hudson River to connect Rockland and Westchester counties in New York. Replacing the outmoded Tappan Zee Bridge, the crossing features twin tower cable-stayed main spans with 1,200-foot center spans. Each bridge carries four general traffic lanes plus shoulders, extra-wide emergency lanes, and a shared-use bicycle and pedestrian path with scenic overlooks.

The bridge is being designed and built for USD 3.14 billion by the Tappan Zee Constructors, LLC, consortium, with HDR as lead designer. BIM methods were used to create an as-designed 3D model. The project architects designed the facilities with Autodesk's Revit, while the civil and structural bridge design staff used Bentley products including AECOsim Building Designer, RM Bridge, MicroStation, InRoads Suite, LEAP RC-PIER, Bentley Map, GEOPAK Civil Engineering Suite, i-model Transformer, Bentley Descartes, and ProjectWise.

Using BIM-compliant software from end-to-end provided a more accurate design with a shorter learning curve. Approximately 80 percent of the bridge elements were created using AECOsim Building Designer, and 20 percent were created with RM Bridge. Each element was assigned a unique identifier based on BIM attributes that could be used by construction inspectors.



Special Recognition

Advancing Dimensions in Infrastructure

WINNER

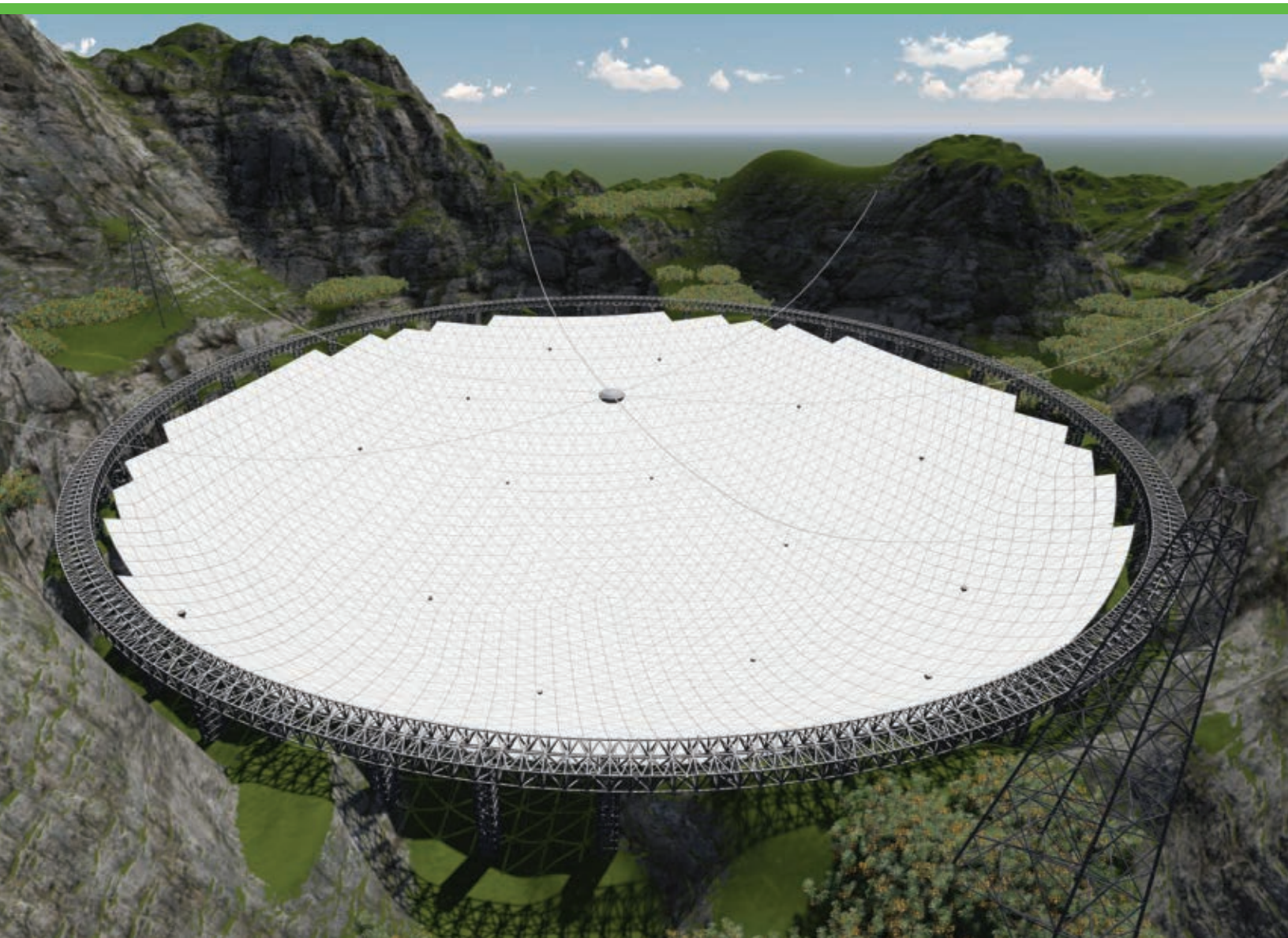
Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences | Karst, China

Five-hundred-meter Aperture Spherical Radio Telescope

One of the top nine science and technology infrastructures in China, the Five-hundred-meter Aperture Spherical Radio Telescope (FAST) will be the largest single-aperture telescope on Earth. Its 500-meter antenna aperture is as large as 30 football fields. Its cable net structure consists of 6,670 main cables, 2,225 downhaul cables, and a 216-ton cable wheel.

This project, which will be 23 years in duration, will generate a huge quantity of data that will be exchanged across all disciplines and between upstream and downstream. ProjectWise provides a multidiscipline, collaborative working environment for the nearly 200 designers. To date, this platform has helped to reduce the five-year timeframe for scientific research design to three years.

BIM technology was applied from site selection and design to construction, providing a firm foundation for construction accuracy control. The project team deployed Bentley solutions such as AECOsim Building Designer, MicroStation, Bentley Navigator, and ProSteel. Benefits included optimizing the 445 network cable nodes to cut costs by CNY 4 million, and applying standardized BIM design specifications to save CNY 3.2 million.



Special Recognition

Advancing Information Technology

WINNER

Michigan Department of Transportation | Michigan, United States

ProjectWise: A Change in Construction

This project transformed how the Michigan Department of Transportation (MDOT) documents construction projects – going from a paper-based system to a fully electronic system using ProjectWise. With approximately 400 trunkline construction projects, the department needed to virtually connect the MDOT staff involved with the construction process with the project stakeholders.

After using ProjectWise in design for more than 11 years, MDOT tested its use in construction with four pilot projects totaling USD 130 million in infrastructure. ProjectWise workflows and a standard folder structure were created to facilitate management of construction documents, and all files for the pilot projects were submitted electronically and stored in ProjectWise. For the first time, all documents requiring signatures or approvals were signed and approved electronically. ProjectWise provided full accountability and a complete audit trail.

The ProjectWise Explorer Mobile app gave field inspectors and contractors real-time access to data. Security and firewall issues were quickly resolved for external users. Implemented at minimal cost, this project eliminated paper by mandating electronic submittal and storage of construction documents. Savings in mail-related costs alone were estimated at USD 7.45 million per year. The electronic approval process also cut 30-day approval times to an average of three days.



Special Recognition

Advancing Urban Infrastructure

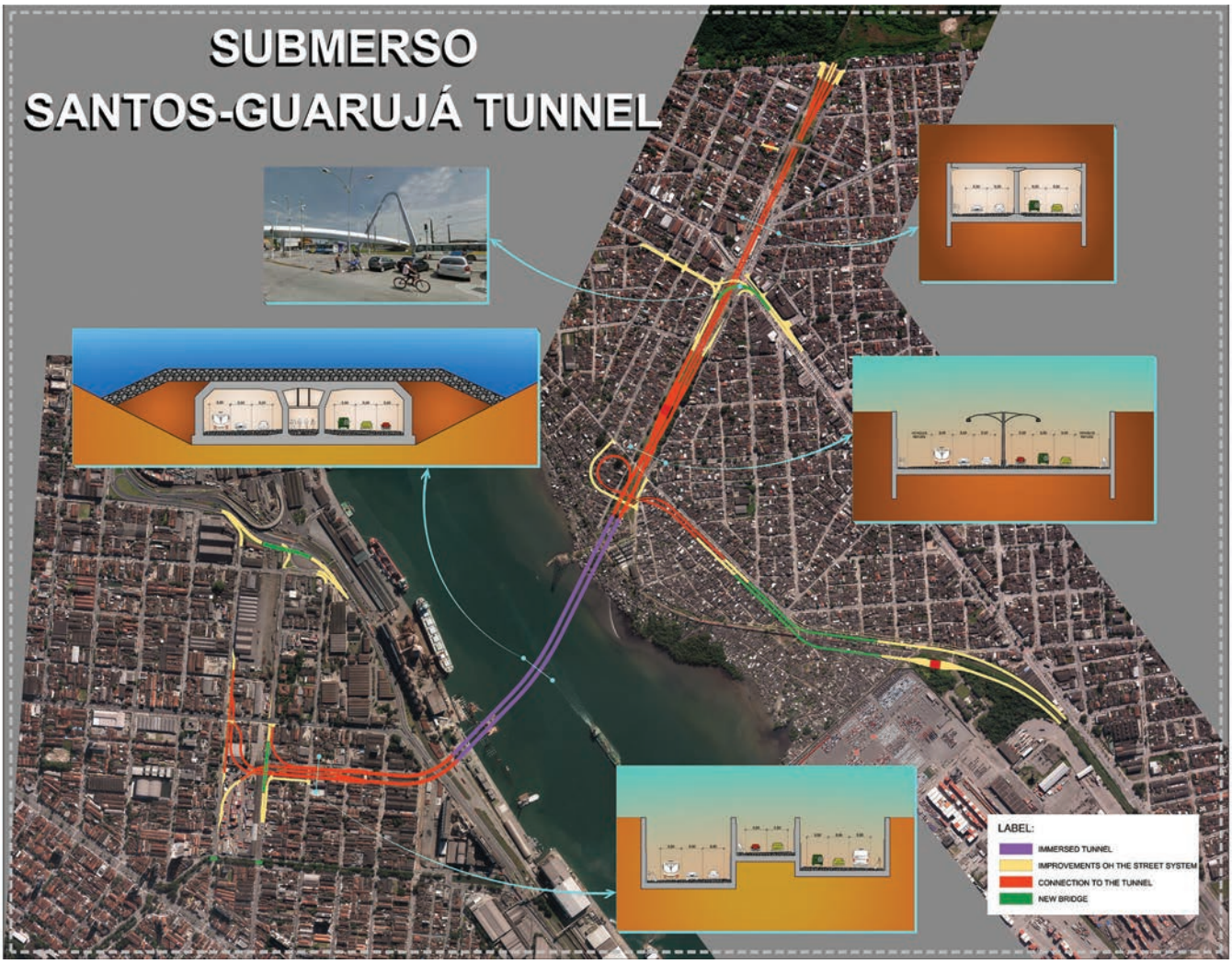
WINNER

Engevix Engenharia, Themag Engenharia, and Planservi Engenharia
Santos and Guarujá, São Paulo, Brazil | **Santos Guarujá Tunnel**

As the largest port in Latin America, the Port of Santos, Brazil, processes approximately 7 million tons of cargo per month and hosts the largest fleet of cruise ships in Brazil. The channel entrance separates the popular beachfront cities of Santos and Guarujá. To improve mobility and reduce the average travel time between the cities, a new 870-meter tunnel with 950 meters of access ramps will run 21 meters beneath the channel.

Engevix Engenharia, Themag Engenharia, and Planservi Engenharia partnered to engineer the BRL 2 billion project. In a technological first for Brazil, all parts of the tunnel will be built on the surface, and then submerged to the channel bottom. Bentley PowerCivil for Brazil rapidly developed the geometry and visualized the project. ProjectWise enabled collaboration of international teams while maintaining data security. Both products reduced lead time by facilitating interaction among disciplines.

A major challenge was adjusting the geometry of roadways to access the tunnel from densely built, historic areas of the cities. The alignments will avoid interference with protected mangroves, and historical and cultural assets. During peak season, the tunnel will enable 35,000 cars per day to cross the channel, reducing the average crossing time from 90 minutes to just two minutes.



Special Recognition

Effective Strategies in Construction Modeling

WINNER

Takenaka Corporation | Toyota-shi, Aichi-ken, Japan

Yawaragi Mori no Stadium

Takenaka executed this 4,820-seat stadium project on behalf of an auto parts manufacturing group as part of the client's 75th anniversary commemoration. Takenaka needed to complete this project in the ultra-short period of 9.5 months – 60 percent of the normal construction period. A shortage of skilled construction workers in the Japanese construction industry demanded further efficiencies in manufacturing and on-site construction.

Using MicroStation and GenerativeComponents, Takenaka automated the 3D modeling of the Yawaragi Mori no Stadium in Toyota, Japan, which reduced the labor required to produce drawings and eliminated human error from the modeling work. Parametric modeling with GenerativeComponents also reduced the labor required for the modeling itself by 50 percent.

The parametric design method was instrumental in the study, selection, and production of rational construction components. The 3D design data was shared from design stage to factory fabrication stage to onside construction stage. GenerativeComponents quickly created the complex models for steel framework fabrication, including all of the attached pieces and finishing materials. Highly accurate 3D laser processing based on these models was used to fabricate precision components. Rational fabrication and processing of complex steel framework components alleviated the shortage of skilled construction workers and reduced project delivery costs by 10 percent.



Special Recognition

Educator of the Year

WINNER

Artur Krawczyk | Kraków, Poland

Lecturer, AGH University of Science and Technology

Artur Krawczyk, Ph.D., has been a lecturer at AGH University of Science and Technology (AGH UST) since 2001, but his history with the university goes back to his student days. In 1994, he graduated with an MSc in environmental engineering, and in 2000 he added a Ph.D. with a focus on mining surveying. Dr. Krawczyk's passion for inspiring students to advance their understanding of engineering software dates back to his first teaching assignment. He developed a new course on fundamental software skills for the mining industry that was subsequently incorporated into the university's Mining Surveying curriculum. The course, which included software programming and administration using MicroStation Basic, filled nine lecture halls annually over the next five years.

Dr. Krawczyk followed this success with innovative courses on MicroStation for Mining Surveying, Computer Graphics, Spatial Information Systems for Environmental Engineers, and Spatial Information Systems for Mining Engineers. In 2006, Dr. Krawczyk created a Student Association of Computer Graphics designed to provide highly motivated students with extracurricular training in 3D modeling. Inspired by this advanced learning, student members entered 18 projects in the Bentley Student Design Competition over the next eight years – with four winning the prestigious Scott Lofgren Student Design Award and three receiving honorable mentions.



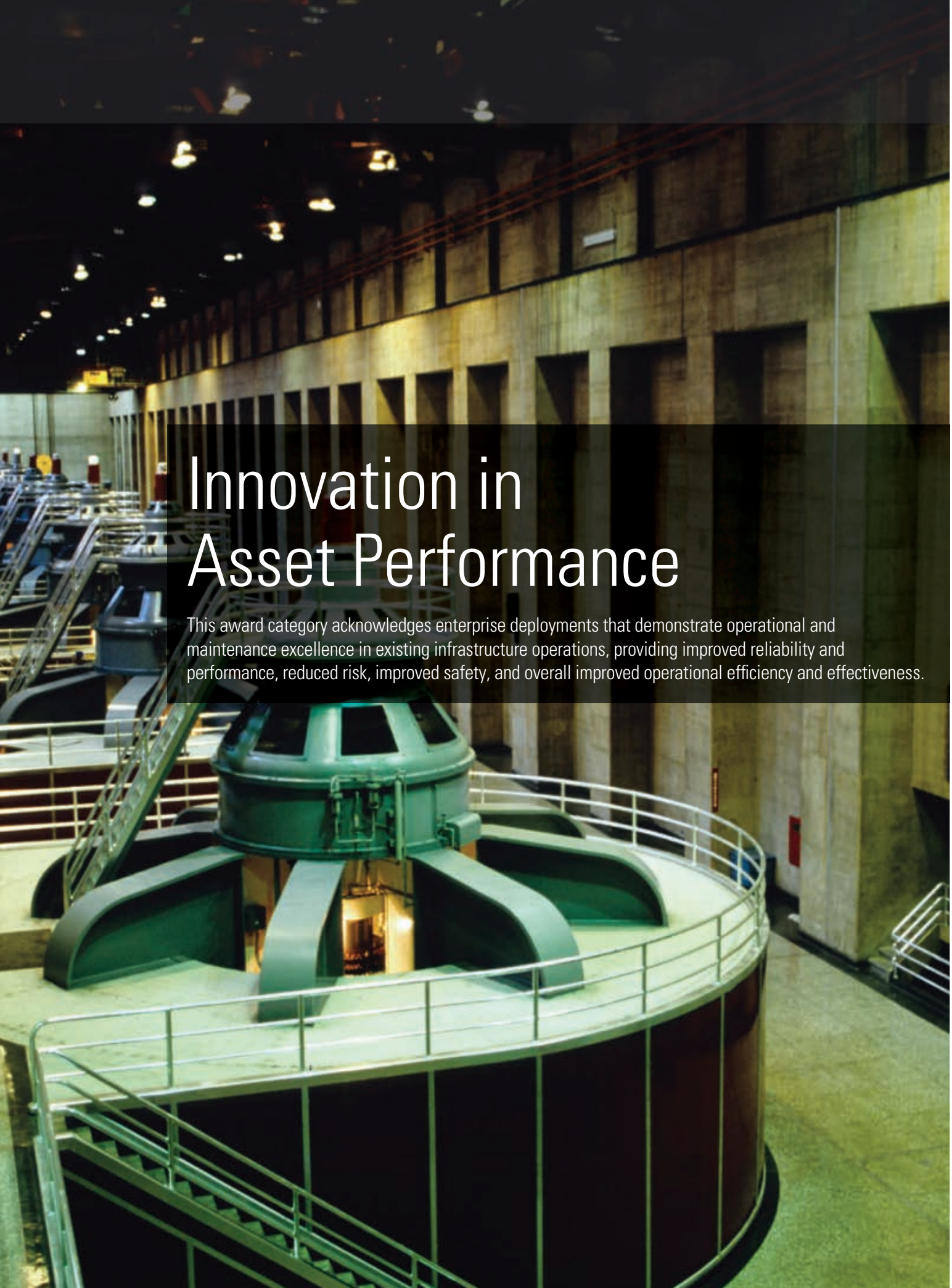






"Bentley's integrated tools, ProjectWise collaboration environment, and commitment to lifecycle data use have empowered us to achieve consistent authoring of plant, civil, and building information models allowing us to develop and validate content from anywhere across the globe, whether in office or on site from a single source of truth."

– Brent Mauti, CH2M HILL



Innovation in Asset Performance

This award category acknowledges enterprise deployments that demonstrate operational and maintenance excellence in existing infrastructure operations, providing improved reliability and performance, reduced risk, improved safety, and overall improved operational efficiency and effectiveness.

Innovation in Asset Performance

WINNER

Severn Trent Water Ltd | Midlands, United Kingdom

ETоN 6 – Technology in Street Works

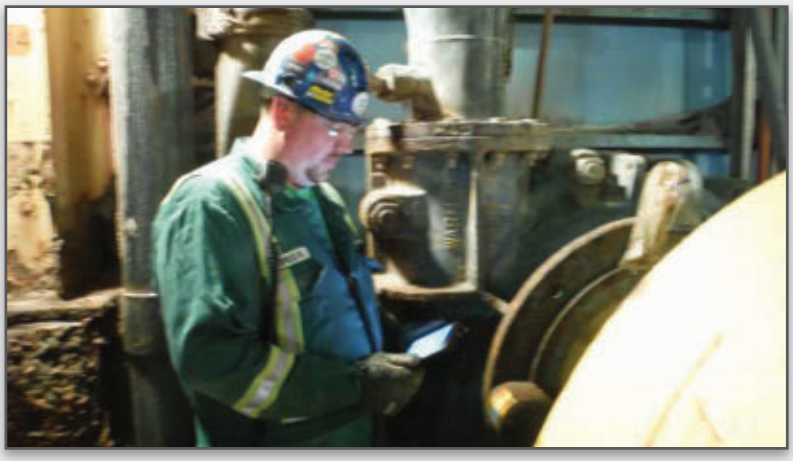
Severn Trent Water provides drinking water to 7.4 million people and waste services to 8.5 million people. To meet the new U.K. Electronic Transfer of Notifications (EToN 6) regulatory requirements, the company developed an asset management solution for 1,000 key business users. The solution enables the company to avoid hefty penalties and charges from 36 highway authorities in its operating area, and sends 330,000 compliant notices to the highway authority.

The use of Exor ensured compliance, providing two-way exchange from a central base (23 people) to field mobile devices and contract portal interfaces (six departments and 1,000 indirect users). The system enables collaboration and aligns assets for end-to-end asset management. Cooperation with Bentley resulted in a 50 percent reduction in project costs and an accelerated schedule. Working together in innovative ways to ensure delivery of the right work on the first visit, Severn Trent Water avoided penalties in excess of GBP 6 million while ensuring customer service, regulatory compliance, and social responsibility.





>>>> **VIEW PRESENTATIONS** @ *www.bentley.com/projects2014*





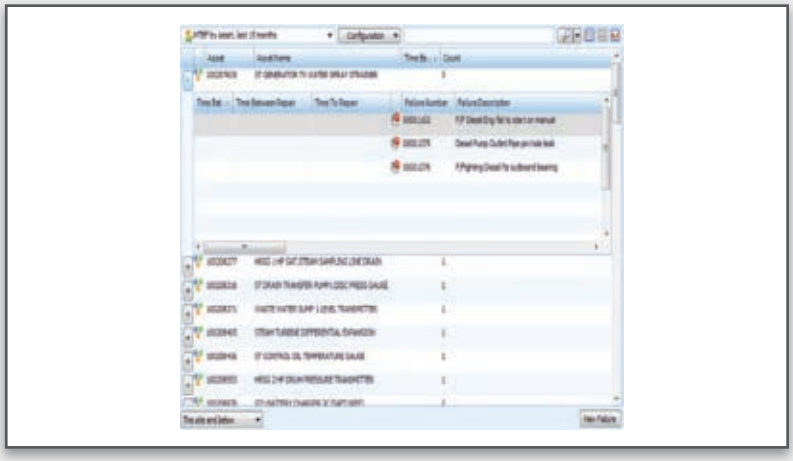
FINALIST

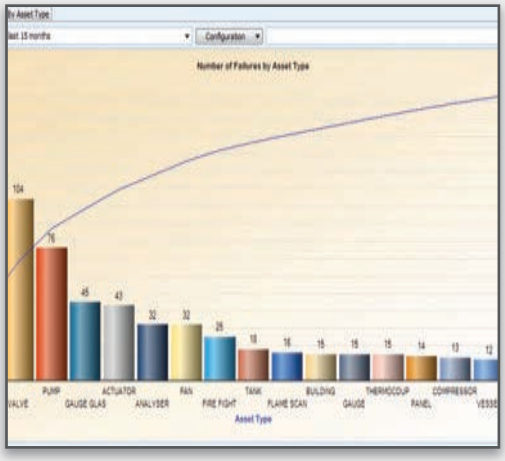
Agrium Inc. | Vanscoy, Saskatchewan, Canada

Agrium Vanscoy Potash Operations Reliability Improvement Project

The goal of this ambitious project in Agrium's Potash Mine and Mineral Processing facility in Vanscoy, Saskatchewan, Canada, was to improve plant reliability by 50 percent by 2015. The challenge was to implement systems and tools that would help change the overall culture of the facility and create sustainable improvement. The introduction of a reliability-centered program supported by AssetWise APM on mobile devices for operations and maintenance inspection routes facilitated the team's ability to make improvements.

The reliability process has instilled a change in the facility's workforce culture, and improved the partnership between operations and maintenance towards reliability and business goals with measurable results in profit, environmental sustainability, safety and social responsibility. The system reporting was recognized by the Saskatchewan Department of Environment as industry leading.





FINALIST

Tenaga Nasional Berhad | Kuala Lumpur, Malaysia

Asset Performance Management at Tenaga Nasional Berhad Power Plants

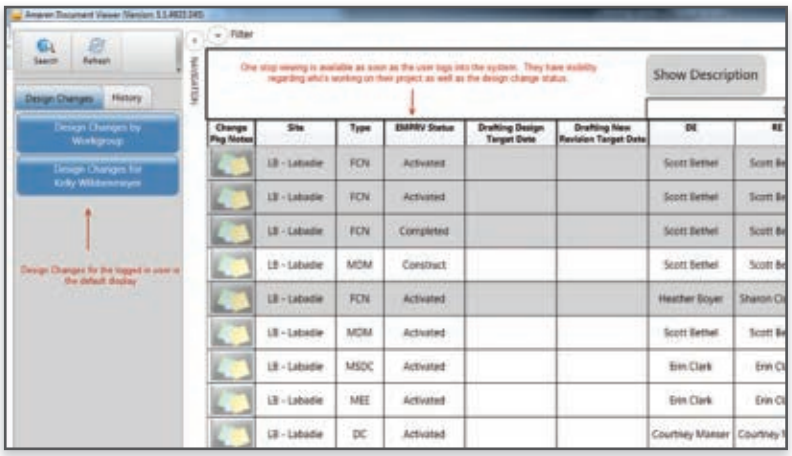
Tenaga Nasional Berhad is the largest electricity utility in Malaysia. With almost MYR 87 billion in assets, the company's more than 33,500 employees serve an estimated 8.3 million customers. Because vital information previously had been contained in multiple databases or paper-based records, this project's goal was to centralize all asset information so engineers could make timelier and more informed decisions, thus reducing reactive maintenance.

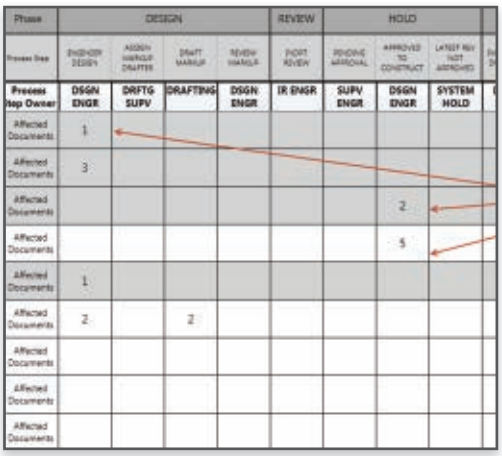
The utility implemented AssetWise APM (Ivara) to act as a central repository and asset health dashboard that drives a proactive process for asset reliability and performance. The system incorporates asset risk prioritization and reliability-centered maintenance as the foundation of the asset management process. The project has reduced downtime and unplanned outages while at the same time reducing maintenance costs.

Innovation in Asset Performance

AmerenUE | St. Louis, Missouri, United States

Design Change Revitalization Project



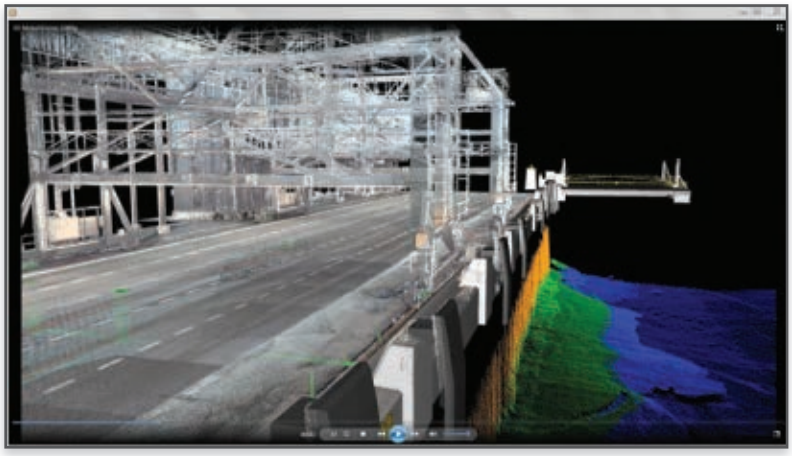


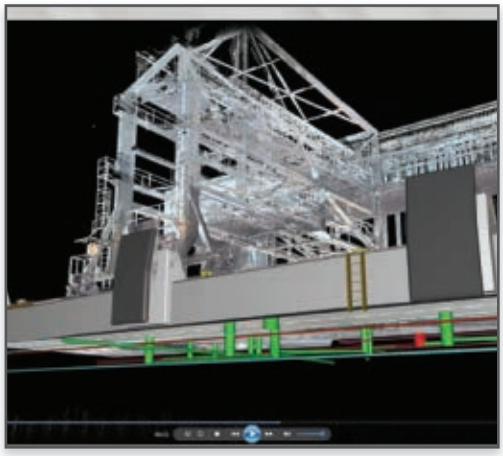
For this project AmerenUE leveraged the versatility of eB and familiarity with its own in-house work management system to create a new front-end application known as the Ameren Document Viewer to automate the process for managing design modifications at its non-nuclear power plants. The Ameren Document Viewer displays a consolidated view of all relative design change information, while eB is the back-end system, ensuring the appropriate checks are made and that data inaccuracies do not occur.

Using the Ameren Document Viewer, design changes now are easily accessible from a main overview display equipped with powerful filtering and drilldown capabilities. Implementing standard procedural steps from beginning to end for the workflow of document and drawing updates further streamlined the overall process. The viewer also offers increased visibility for supervisors and upper management that was not available with the old system.

Mericon Oy | Helsinki, Finland

3D Maintenance Model Development Project





The goal of this project in Helsinki, Finland, was to develop a methodology for creating comprehensive 3D maintenance models for infrastructure sites that are located by water and/or include underwater structures. It enables Mericon Oy to sell a new kind of service that is applicable to both infrastructure projects and owner-operators of infrastructure assets. It will become a standard offering with all relevant future projects.

Mericon Oy used MicroStation and PowerCivil for Finland to combine underwater/overwater data and structural/terrain models into one comprehensive model that can be used for maintaining assets in the area. This accurate model of the infrastructure assets not only delivers improved reliability and lower maintenance costs, but it also prevents design errors. An accurate as-built model of the site also eliminates design errors in future projects.



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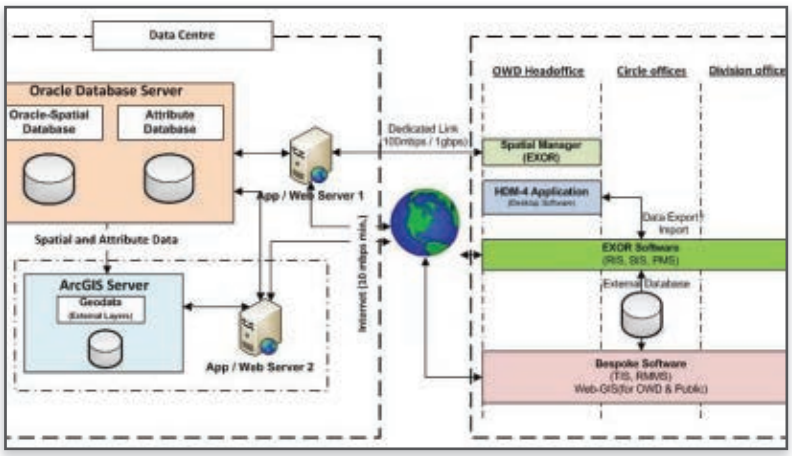
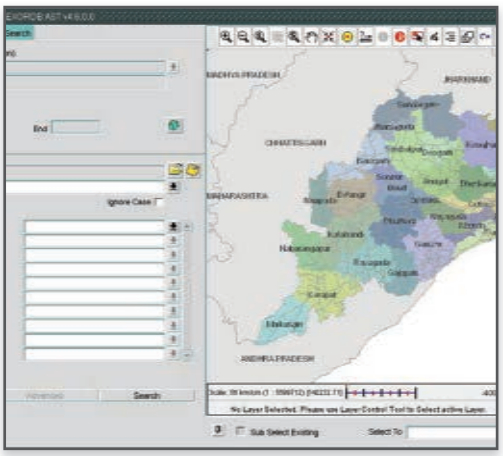
Odisha Works Department | Bhubaneswar, Odisha, India

Odisha Road Asset Management System



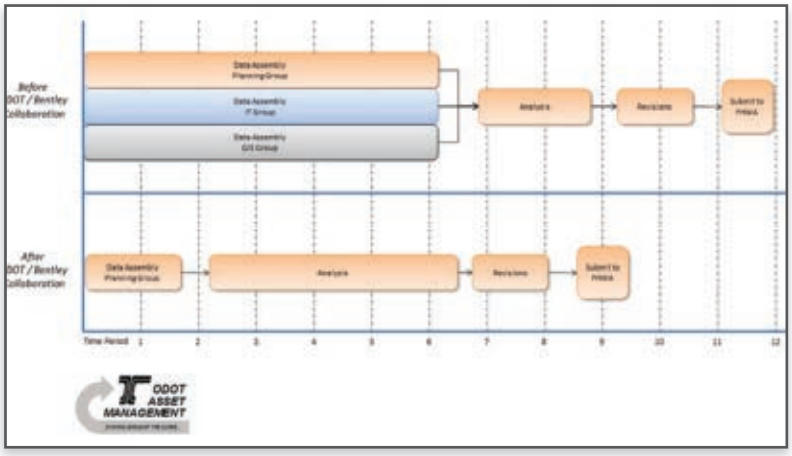


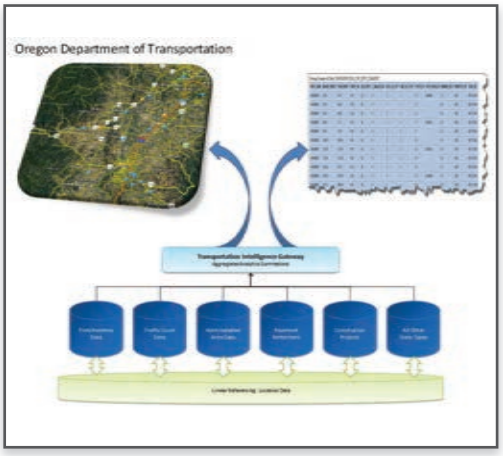
Through the Government of India, the State Government of Odisha received a loan from the International Bank for Reconstruction and Development to implement the Odisha State Roads Project. A portion of this loan was to establish a road asset management system for the 14,000-kilometer state road network, which will assist the Odisha Works Department in making the best use of public funds for the maintenance of its road networks.

Configured using the Exor Intelligent Transportation Gateway, the system primarily uses an Exor/Oracle database that is accessible to approximately 40 offices through a Web browser. Because it is mandatory to establish scientific principles and a system-based asset management system when seeking funds from the federal government, this project has delivered a vehicle for convincingly demonstrating the region's road network needs.

Oregon Department of Transportation | Salem, Oregon, United States

Transportation Information Gateway Collaboration





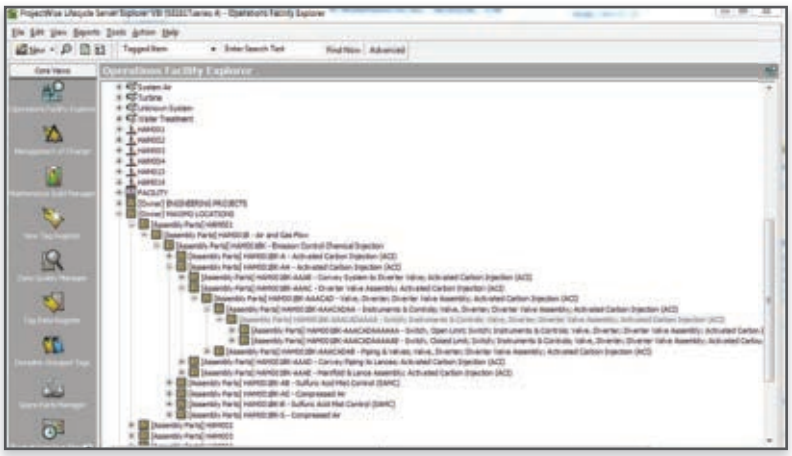
Like other U.S. Departments of Transportation (DOTs), the Oregon DOT must regularly publish highway and asset data in the form of federal, state, and agency reports, data layers, and extracts. This project implemented a core transportation asset management system consisting of Exor Network Manager, Exor Asset Manager, and Exor Spatial Manager. The goal was to develop a new approach to aggregating and analyzing transportation asset data.

The Exor Transportation Intelligence Gateway enabled the Oregon DOT to assemble data from the sources needed to quickly produce the annual Highway Performance Monitoring System extract for the Federal Highway Administration, among other state and federal reports. The DOT also has deployed this tool to move data from its Exor system to its GIS applications, intelligent transportation systems, and data consumers across the department.

Innovation in Asset Performance

Southern Company | Atlanta, Georgia, and Birmingham, Alabama, United States

Seamless Handover of Project Data for Asset Operations and Maintenance Using eB Data Quality Manager





For Southern Company's capital projects, one of the largest challenges is the handover of engineering information to operations and maintenance. The goal of this project was to create a true cradle-to-grave asset lifecycle information management tool that allows information to flow across disciplines, departments, and organizations from an asset's inception in conceptual design through operations and eventual decommissioning.

Since piloting the handover processes using eB Data Quality Manager (now Bentley Data Quality Server) at Plant Ratcliffe in the fall of 2013, over 51,000 plant locations have been created. The bulk of these locations have been created for the soon-to-be-commissioned Plant Ratcliffe IGCC facility. The rest have been created for environmental projects at four existing coal fire facilities. By ensuring the seamless handover of quality asset information to facilities, Southern Company has significantly reduced the cost to operate assets.





Innovation in Bridges

This award category recognizes projects that have demonstrated excellence in planning, designing, building, modeling, analyzing, and maintaining bridges of all sizes and complexity.

Innovation in Bridges

WINNER

Anhui Transport Consulting & Design Institute Co., Ltd | Wuhu, Anhui, China

Second Wuhu Yangtze River Highway Bridge

The Second Wuhu Yangtze River Highway Bridge under construction in Wuhu, Anhui, China, will improve the regional highway network and promote economic and social development in central China. Connected to the Wuhu-Tongling Freeway, the CNY 9.45 billion 57-kilometer project includes a 13-kilometer-long bridge, with extensions of 23 and 21 kilometers on the north and south banks respectively.

The bridge is notable as the largest assembly of whole steel beam sections, and the longest cable-stayed span with four cable planes. Working in the ProjectWise collaborative environment with 3D bridge design solutions by Bentley, Anhui Transport Consulting & Design Institute carried out design and review 20 percent more efficiently, and shortened design delivery time by eight weeks. The resulting 3D information model will reduce operation and maintenance costs by an estimated USD 2 million.





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FINALIST

Hanson Professional Services Inc. | Salcha, Alaska, United States

Alaska's Northern Rail Extension: Tanana River Bridge

Hanson Professional Services Inc. (Hanson) is providing design engineering services for Alaska Railroad Corporation's 129-kilometer Northern Rail Extension from the city of North Pole, Alaska, to Delta Junction, Alaska. This four-phase project will provide a safer, all-weather transportation option and give the military improved, year-round access to training facilities south of the Tanana River.

Phase 1 construction of the USD 188 million Tanana River Bridge in Salcha will serve vehicular and railroad traffic with a single bimodal deck. Hanson is addressing significant geotechnical, hydraulic, and seismic issues with the 1,006-meter, 20-span bridge. The project team relied upon InRoads, Bentley Rail Track, and ProjectWise, together with MicroStation that was used to produce the AutoCAD files required by the client. Bentley software saved approximately USD 141,000 in training, file-conversion, and travel costs, while also enhancing productivity.





FINALIST

HDR | Westchester, New York, United States

Tappan Zee Hudson River Crossing: The New NY Bridge

The New NY Bridge will cross the Hudson River to connect Rockland and Westchester counties in New York. Replacing the outmoded Tappan Zee Bridge, the crossing features twin tower cable-stayed main spans with 1,200-foot center spans. Each bridge carries four general traffic lanes plus shoulders, extra-wide emergency lanes, and a shared-use bicycle and pedestrian path with scenic overlooks.

The bridge is being designed and built for USD 3.14 billion by the Tappan Zee Constructors, LLC, consortium, with HDR as lead designer. BIM methods were used to create an as-designed 3D model. Bentley products included MicroStation, InRoads Suite, RM Bridge, LEAP RC-PIER, Bentley Map, GEOPAK Civil Engineering Suite, i-model Transformer, Bentley Descartes, AECOsim Building Designer, and ProjectWise. Bentley software enabled a more accurate design with a shorter learning curve.

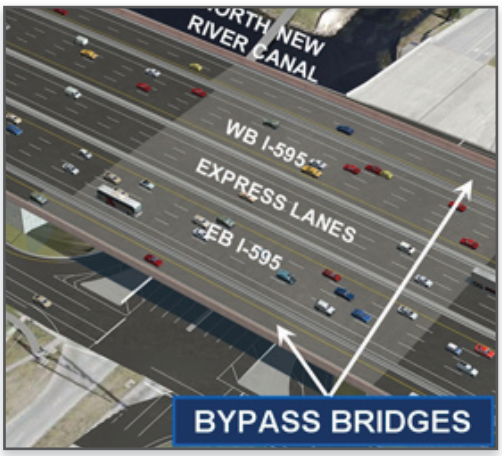
Special Recognition Award Winner Advancing Comprehensive BIM "Playbooks"

Innovation in Bridges

Beiswenger, Hoch and Associates, Inc. | Ft. Lauderdale, Florida, United States

I-595 Reversible Lanes



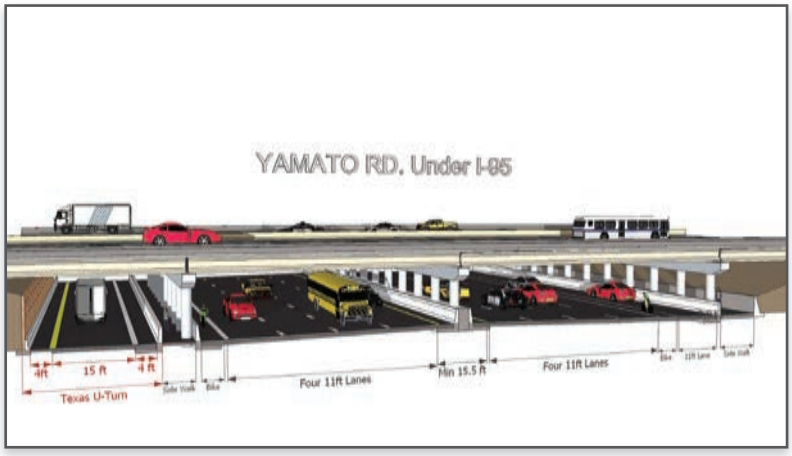


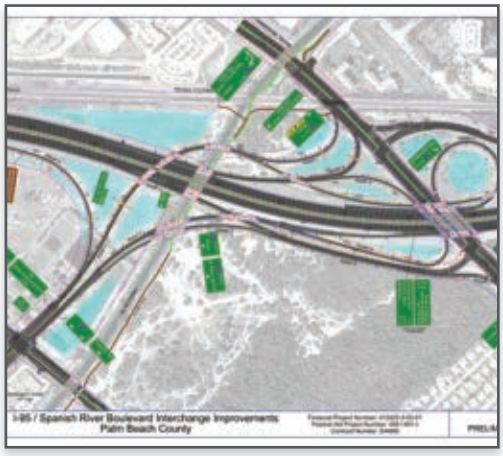
The Florida Department of Transportation's I-595 Express Corridor Improvements Project will optimize mobility and provide reliable travel times in express travel lanes for this Ft. Lauderdale corridor. The USD 1.2 billion design-build project consisted of reconstructing 10.5 miles of the I-595 mainline, frontage road, and ramps as well as 2.5 miles of Florida's Turnpike. Beiswenger, Hoch and Associates was lead engineer for Zones 1 and 2.

OpenRoads' corridor modeling tool allowed BHA to visualize all the roadways, structures, walls, drainage, and utilities; detect any interdisciplinary conflicts; and create 3D plans. Using GEOPAK Civil Engineering Suite and LEAP Bridge, BHA revised the alignment concept proposed in the RFP and developed a design that accelerated bridge construction using prestressed Florida I-Beams. Bentley software allowed for significant cost savings.

Beiswenger, Hoch and Associates, Inc. | Ft. Lauderdale, Florida, United States

Spanish River Interchange Improvements



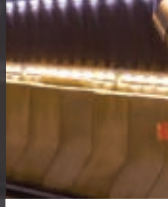


Located in Palm Beach County, Florida, the USD 66 million Spanish River Interchange project will improve access to and from Florida Atlantic University and I-95, and relieve traffic on the adjacent Glades Road and Yamato Road interchanges. The project includes new access roads, ramps, and auxiliary lanes as well as road widening and intersection improvements. A total of 13 bridges are involved, including eight that were newly constructed, three that were widened, and two replacement bridges.

Beiswenger, Hoch and Associates (BHA) used GEOPAK Civil Engineering Suite and LEAP Bridge to develop an accelerated bridge construction scheme that replaced proposed steel structures with Florida-I Beam prestressed concrete bridges. The OpenRoads corridor modeling tool enabled rapid design iteration, resulting in substantial cost savings. Overall, Bentley software automated and reduced the design time required for a project of this magnitude.



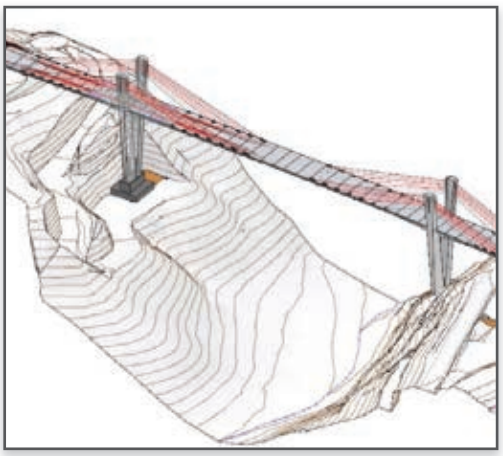
>>>> **VIEW PRESENTATIONS** @ *www.bentley.com/projects2014*



Comsa Emte | Teror, Isla de Gran Canaria, Provincia de Las Palmas, Spain

Teror Bridge Construction Using Civil BIM Methodology





The EUR 12.6 million Teror Bridge spans a picturesque valley on Isla de Gran Canaria, Provincia de Las Palmas, Spain. As a gateway to this beautiful territory, the 145-meter-long structure was designed as an extradosed cable-stayed bridge, enabling it to cross without intermediate supports and thus reduce environmental impact.

BIM methodology was used for 3D modeling of the prestressed concrete bridge and all its structural elements, minimizing errors in data for stakeout, drawings, and checking. EIPSA designed the viaduct and used RM Bridge analysis software to calculate the theoretical deformations in all phases of construction. Comsa Emte used InRoads and MicroStation to monitor the construction. Using BIM methodology reduced project delivery time and cost by 40 percent.

FIGG Bridge Engineers, Inc. | Brownsville, Pennsylvania, United States

Monongahela River Bridge



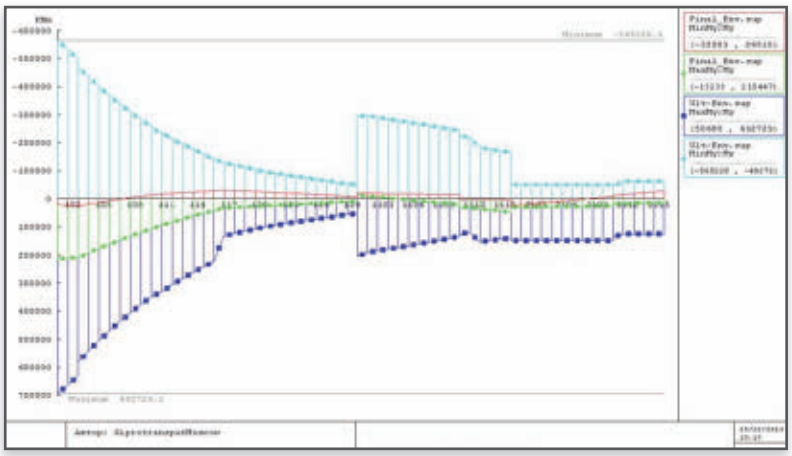


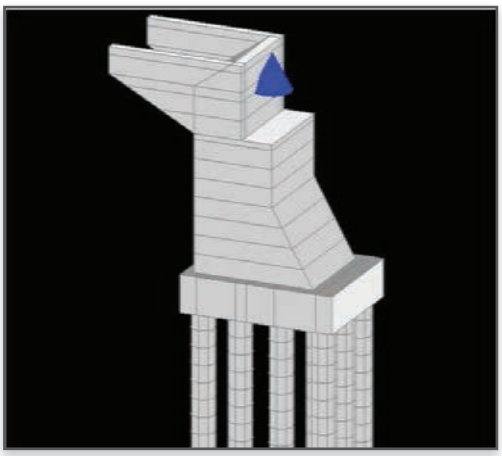
The Mon-Fayette Expressway will provide more than 70 miles of limited-access highway in Allegheny, Washington, and Fayette counties south of Pittsburgh, Pennsylvania. Opened in July 2012, the USD 97.9 million Monongahela River Bridge (Section 51H of the project) alleviates truck traffic on US Route 40 along the 17-mile stretch from Uniontown to Brownsville. As Engineer of Record for the Pennsylvania Turnpike Commission, FIGG Bridge Engineers provided final design, construction engineering, and on-site inspection services.

The 3,022-foot-long segmental concrete bridge features seven continuous spans, including a 518-foot main span, octagonal 200-foot-high piers, and variable-depth superstructure. Given the fast-paced schedule, MicroStation was used to allow FIGG to merge working engineering drawings into construction drawings, generating time savings that decreased the cost of project delivery. MicroStation's accuracy in 3D modeling helped to avoid conflicts, which minimized risk for the contractor.

Innovation in Bridges

Giprotransput | Nizhniy Novgorod, Russia
Volga Bridge





Built in 1935 as a railway bridge and expanded in 1965 to carry a road, the Volga Bridge required major reconstruction to ensure the safety of road-rail transportation in Nizhniy Novgorod, Russia. The 1,200-meter bridge is the only permanent crossing of the Volga River in the area. Giprotransput provided comprehensive computation of new loads for the RUB 837.6 million project.

RM Bridge provided the specialized functionality required to conduct in-depth analysis of the road-rail bridge. Giprotransput modeled existing supports in complex, non-standard shapes based on fatigue characteristics of steel and concrete. The engineering solution provided the necessary structural load capacity for the bridge supports and foundation. Bentley software helped to substantiate the accuracy of the solutions and ensure the bridge successfully passed technical inspections – all while reducing design time.

K2 Ingeneiría | Zamora, Zamora, Spain
New Bridge over Duero River





The EUR 16 million bridge over the Duero River in Zamora, Spain, will improve communication and connectivity between the city and Portugal. Completed and operational in July 2014, the cantilever bridge is 1.6 kilometers long with two lanes, a bike path, and sidewalk. It was designed by noted bridge designer Javier Manterola, a civil engineer and professor at the Escuela Superior de Ingenieros of Madrid.

FCC, a leading company in the construction of infrastructure and facilities in Spain, retained K2 Ingeneiría to check the cantilever geometry. Using RM Bridge to verify the geometry of the deck ensured that the construction sequence took into account the non-linear behavior of concrete due to creep and shrinkage, as well as changes in the structure during construction.



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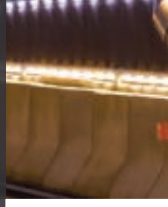


L&T Construction | Kochi, Kerala, India

Kochi Metro Cantilever Construction





Kochi Metro is a proposed rapid transit system for the city of Kochi in Kerala, India. The 25.65 kilometer metro line will run from Aluva to Petta and will include 22 stations. A joint venture between the central and state governments of India, Kochi Metro Rail Ltd. will operate the USD 950 million project. L&T Construction was awarded the design-build contract for 350 meters of viaduct and approaches over Ernakulam Junction railway station.

With an alignment crossing a rail over-bridge, six railway tracks, and busy station, the bridge is being constructed using a balanced cantilever with form traveler. Using RM Bridge, Power Rail Track, and Bentley Rail Track on this complex project reduced the time required for optimum span configuration by 50 percent.

Silga | Riyadh, Saudi Arabia

New Azizia Bridge





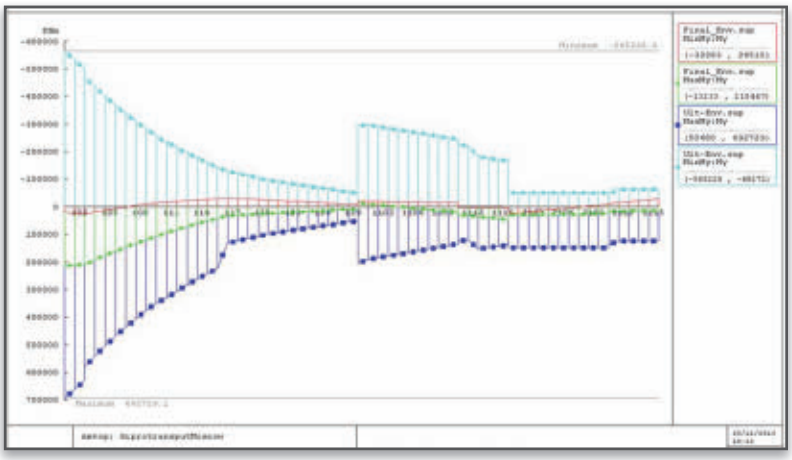
To improve road safety and reduce journey times, the Saudi Arabia Ministry of Transport commissioned a USD 100 million construction supervision package for the Riyadh Second Ring Road South East Leg, and several roads and junctions in Northern Riyadh. The project includes a 1,500-meter-long bridge joining Ali Ibn Abi Talib Road with Al-Azizia Road and passing over the Sanaa Square Bridge to form part of the Southern Ring Road.

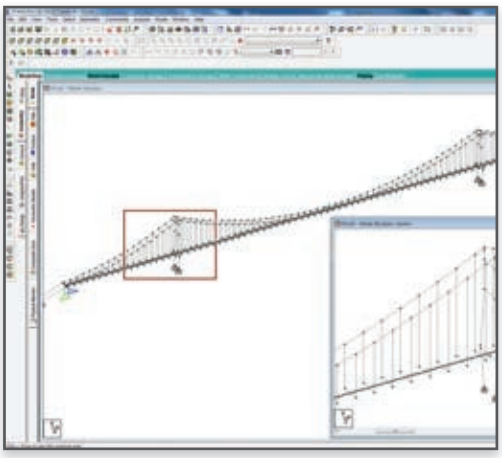
Silga is using RM Bridge to design and analyze the bridge construction sequence, taking into account the non-linear behavior of the concrete due to creep and shrinkage and the changes in the structure during the construction. RM Bridge enables Silga to respond faster to customer requests and as a result, keep its costs to customers low.

Innovation in Bridges

Taesung S&I | South Korea

Pre-feasibility Study System for Long-span Cable Bridge





A pioneer in civil BIM, Taesung S&I provides civil engineering and program development in South Korea and abroad. To review the validity of participation in a cable-stayed bridge project tender, Taesung S&I needed to review the costs for various alternatives within a short time. This pre-feasibility study involved 3D model creation, cost calculation, and quantity extraction for a long-span cable bridge in South Korea.

Using MicroStation for 3D modeling and STAAD.Pro for structural analysis, Taesung S&I was able to calculate more exact quantities and consider more accurate cost estimates for diverse design alternatives. Bentley software allowed various options to be evaluated and revised, so the total project cost could be reduced. In this case, the estimated cost was KRW 115 million.





Innovation in Building

Advanced technology aids in the delivery of high-quality buildings in terms of aesthetics, adherence to program, and meeting budget. It is also increasingly critical in areas of environmental sustainability, operational performance, and compliance with regulations and accreditations. The projects in this award category demonstrate excellence in the planning and design, simulation and analysis, delivery, or operation of one or more buildings.

Innovation in Building

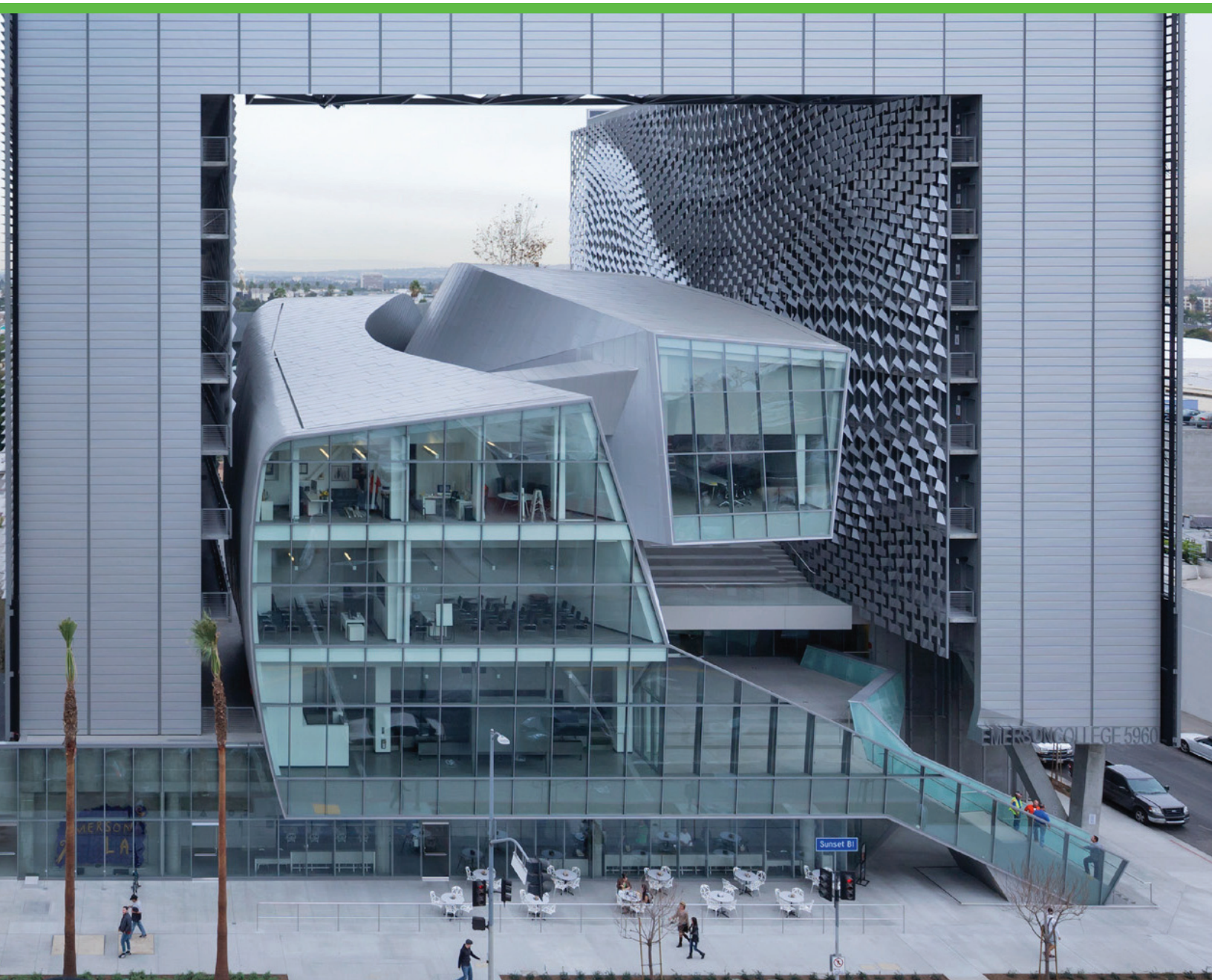
WINNER

Morphosis Architects | Los Angeles, California, United States

Emerson College Los Angeles

This mixed-use facility establishes Boston-based Emerson's identity in Los Angeles, California. Designed by Morphosis Architects to be a magnet for activity, it provides an iconic setting for premieres, events, and student showcases that draw the general public, students, and industry professionals. The new USD 85 million facility will also host workshops, lectures, and other events that engage the broader community.

The investment in BIM on this project allowed for seamless workflows among the architect, project consultants, and subcontractors, so detailed 3D models could easily be shared among all key stakeholders. This integrated approach – largely built on AECOsim Building Designer, GenerativeComponents, MicroStation, Bentley Navigator, and ProjectWise – allowed the project team to deliver a state-of-the-art academic building on schedule and on budget.







FINALIST

John Portman & Associates | Yinchuan, Ningxia Hui Autonomous Region, China

Yinchuan Greenland Center

For this mixed-use project, John Portman & Associates combined above-ground office, hotel and boutique retail spaces, with ample auto and bicycle parking below ground. When completed, the towers will be the tallest in the Ningxia Hui region of China. In a nod to the literal meaning of Yinchuan, the towers are linked by a "silver river" in the form of a podium building with a sinuous form.

The 3D BIM model created in GenerativeComponents and AECOsim Building Designer enabled the firm to meet the demanding design schedule by facilitating better design decisions and fostering communication among teams. The design team was brought together early in the design process to coordinate efforts and establish strategies for efficiency in construction, function, materials, water, energy, daylight, and site usage to achieve the project goals.





FINALIST

MWM Architekci Sp. z o.o. | Ustrzyki Dolne, Podkarpacie, Poland

Hotel Arłamów

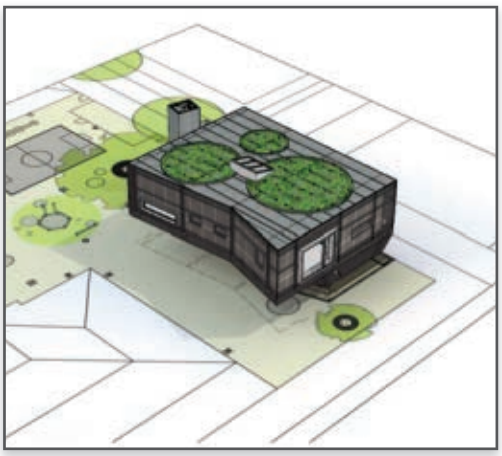
This PLN 300 million project in Ustrzyki Dolne, Poland, included a hotel, conference center, sports hall, football stadium, and golf course on a historical site. Integrated data coordination allowed MWM Architekci to avoid errors during the design stage, which resulted in more rapid construction.

AECOsim Building Designer, GenerativeComponents, InRoads, MicroStation, Bentley Navigator, ProjectWise, and ProSteel provided seamless data exchange among a large group of designers and offices during design. As a result, the team produced an accurate 3D model. The tight integration of engineering data and efficient team collaboration also eliminated design errors that would have impacted implementation down the road.

Innovation in Building

AG5 Architects | Copenhagen, Denmark
Kildevælds School





The goal of this DKK 8.5 million project in Copenhagen, Denmark, was to create the optimal learning environment for young students with learning challenges. By raising the classrooms above the school yard, AG5 Architects sought to eliminate outside distractions. Emphasis also was placed on natural daylight and quality materials to ensure an energy-efficient interior. Although simple in overall appearance, the building geometry featuring double-faceted facades was quite complex.

The BIM model, which was created using MicroStation and AECOsim Building Designer, was the basis for construction drawings, project coordination area schedules, and initial steel quantity take-offs. AG5 Architects designed and modeled the initial BIM steel model, which was instrumental in keeping the building's geometry in check. The building surpasses stringent Danish energy regulations and adheres to the upcoming 2015 energy regulations.

Bogle Architects | Beijing, China
Beijing Green Building Park Visitor Center





This CNY 1 billion visitor center in Beijing, China, features design and sustainability innovation. Through the use of high-quality material, well-insulated and correctly ventilated design, and the separation of transient and fully climatically controlled spaces, energy consumption was significantly minimized. Certified BREEAM Outstanding in design, the visitor center epitomizes smart energy use and a carbon-neutral footprint.

MicroStation enabled Bogle Architects to provide 3D models that overcame file format barriers that are often prevalent on large, international projects, in this instance on behalf of Vanke, one of the largest residential developers in the world. MicroStation's ability to open many different types of files and reference them in their native format helped Bogle Architects to work effectively and efficiently with everyone on the team. In addition, being able to produce 3D PDFs helped the team members to communicate clearly with each other, effectively reducing the time needed to further clarify or build physical models.

Captae | Barcelona, Spain

3D Laser Scan Survey of the College of Industrial Engineers of Barcelona





The scope of this EUR 5,000 project encompassed a 3D laser scan survey of three sides of the College of Industrial Engineers of Barcelona building in order to generate CAD drawings. Laser-scanner technology and the implementation of Bentley Pointools allowed Captae to perform the work in record time with minimum disruption to pedestrians and traffic.

The ability to read and import multiple laser-scan and point-cloud formats – along with an ability to work with both DGN and DWG formats – reduced production time significantly. The high performance levels afforded by Bentley Pointools has increased Captae's overall competitiveness and resulted in its being eligible for a greater number of national and international projects.

China Shipbuilding NDRI Engineering Co., Ltd | Shanghai, China

The Application of BIM on Twin Office Buildings



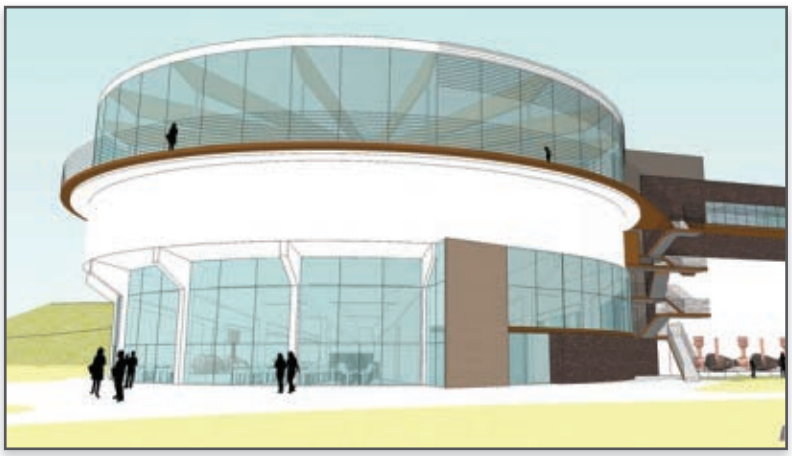


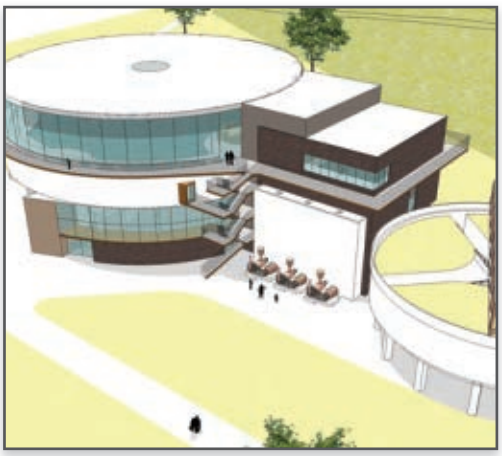
The goal of this CNY 950 million project in Shanghai, China, was to construct two energy-efficient, high-rise commercial office buildings that combine neoclassic and modern design in a high annex style, along with supporting facilities and a two-level underground car park. BIM technology was implemented throughout the planning, design, computational analysis, and virtual construction, which improved overall construction management.

AECOsim Building Designer, MicroStation, Bentley Navigator, ProjectWise, and Bentley Raceway and Cable Management provided a seamless and collaborative BIM working environment that enabled multiple disciplines to design collaboratively, share project information, and make informed decisions throughout the project lifecycle. The product integration avoided repetition and data loss in the information transfer process and maximized the benefits of 3D design.

Innovation in Building

EILAND 7 architecten | Beringen, Belgium
TODI Indoor Diving Center

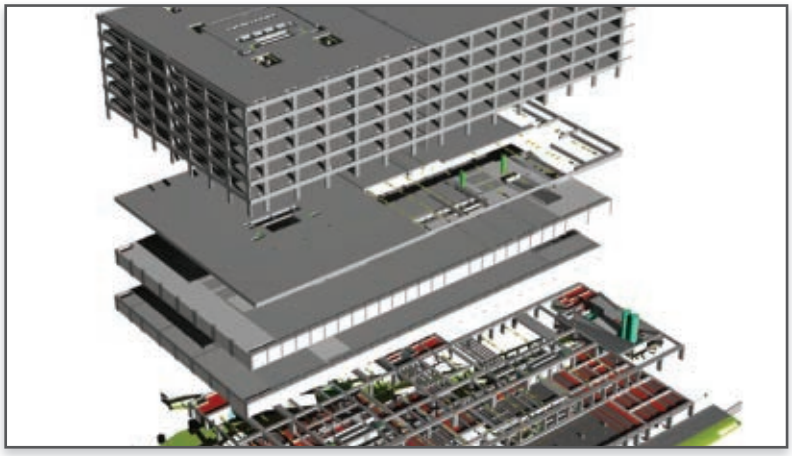


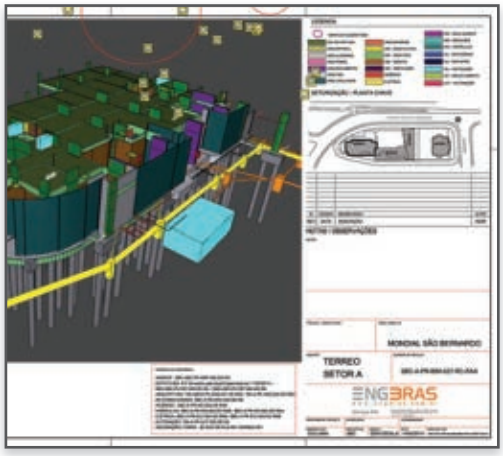


This unique EUR 9 million project in Beringen, Belgium, entailed the conversion of historical and protected coal-mining facilities to an indoor diving center. Three massive concrete structures in which coal used to be washed now serve as a diving basin, training basin, and water treatment facility. The project goal was to invigorate the economy, create job opportunities, and attract visitors from all over Europe.

The EILAND 7 architecten team's challenge was not only the massive volume of water itself, but also the inclusion of tropical fish that prevented typical chlorine disinfection. The project also had to be developed around an existing building protected by the Flemish Heritage Department. The intuitive manner in which designs could be manipulated in MicroStation PowerDraft made it easy to react quickly to changing preconditions.

Engbras Software Projetos Ltda | São Bernardo do Campo, São Paulo, Brazil
BIM Modeling for More Than 2 Million Square Meters of Buildings



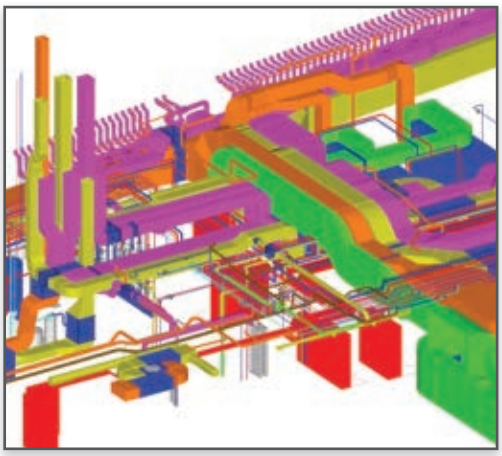


Brazil is experiencing an explosion of increasingly complex new ventures that feature tighter completion deadlines. Engbras Software Projetos believes that only a BIM methodology can guarantee on-time construction deliverables, and has modeled more than 2 million square feet of industrial, commercial, and residential buildings in the last five years using BIM. Since Brazil is still a predominantly 2D culture, an overarching goal is to facilitate the migration to 3D.

Engbras Software Projetos uses AECOsim Building Designer to create workflows in which multiple disciplines share different file formats – including point-cloud models – by integrating them into a single BIM environment. Some of these 3D models are generated as i-models, which then can be opened with Navigator Mobile to understand and monitor projects during construction. With BIM coordination, the number of work interferences and inconsistencies has been drastically reduced, decreasing delays and unanticipated costs.

Felgen & Associés | Niederanven, Luxembourg
Syrdall Schwemm Water World

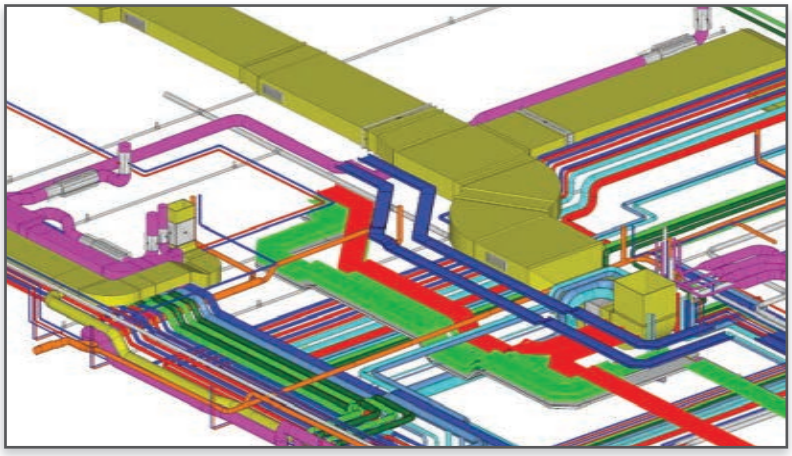




Designed by Felgen & Associés, the EUR 14.5 million Syrdall Schwemm Water World facility is located on landscaped grounds in the valley setting of Niederanven, Luxembourg. The building's architecture was designed to resemble a disc-shaped sculpture with its distinctive roof construction designed by 4a Architect. To get the optimum amount of sunlight inside the building, the entire south and west sides of the building feature a glass facade.

The interoperability of MicroStation and the innovation of i-models provided a means for the easy exchange of design files. Using MicroStation, the team completed precise electrical designs and easily delivered them to the architect. For a complex project like a swimming pool, the electrical design and ventilation must be minutely aligned, and communications with the architect using i-models was crucial to the project's success.

Felgen & Associés, BOLLES+WILSON, and WW+Architects | Luxembourg
Bibliothèque Nationale de Luxembourg





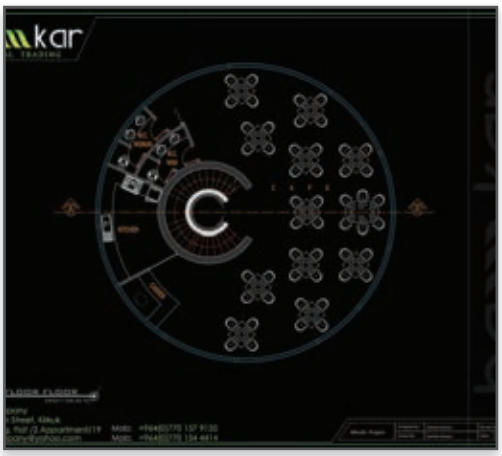
The new EUR 100 million national library in Luxembourg features conference rooms and terraces that lead to upper reading rooms. Underneath there are five levels of secure archival space for legal documents. Since the goal of this design was to keep carbon dioxide emissions to a minimum, the library was designed to use only geothermal energy in the summer and teleheating (district heating) in the winter.

Felgen & Associés used MicroStation and i-models to design and deliver the 3D technical specifications to the architect. Since the electrical design for a library needs precise installation information on lighting, ventilation, networking, and multimedia equipment, MicroStation's interoperability enabled the design team to integrate various software formats into one design, saving significant time and money.

Innovation in Building

Hamkar Company | Halabja, Iraq
Monument of Halabja

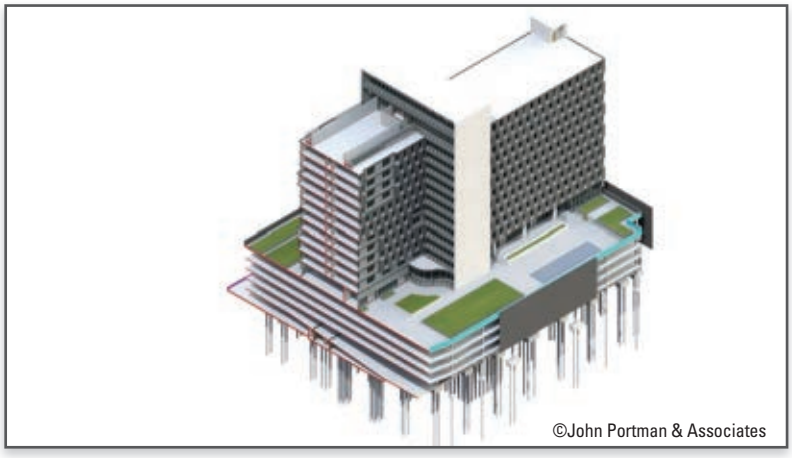




The Halabja Monument is a memorial to the 1988 bombing of Halabja City in Iraq, the worst chemical-weapon massacre in history. At 11 floors tall, the monument is a symbol of hope and tangible evidence of revitalization for a devastated city slowly rebuilding itself. The challenge of this project was to design a building whose vertical axis leans 7 degrees, which is more than the Leaning Tower of Pisa at 5 degrees.

The use of RAM and Structural Synchronizer on this USD 3.2 million project provided an economical design of reinforced steel and concrete that decreased overall project delivery time by 30 percent and overall project costs by 40 percent. Because of the software's efficiencies, Hamkar currently is able to prepare project designs faster, which has increased the number of projects in which the company can participate.

John Portman & Associates | San Diego, California, United States
Lane Field North

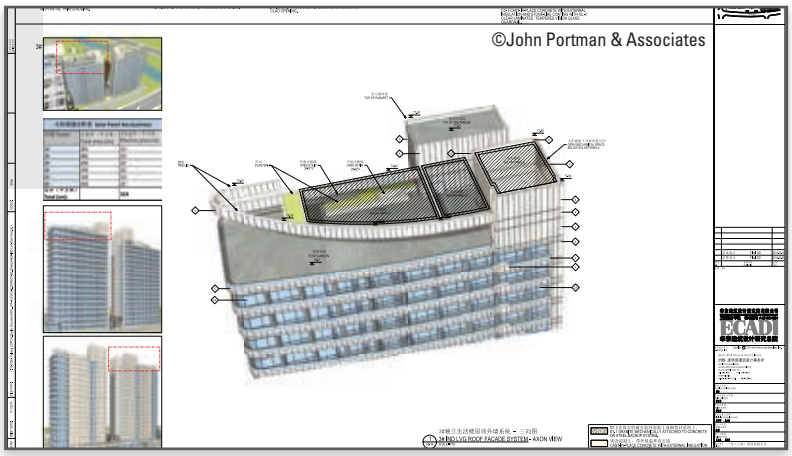




This project was all about location and optimizing the unique qualities of the San Diego, California, waterfront. Lane Field North is ideally located to serve the cruise line industry, which has its boarding docks adjacent to the site. The development features a dual-branded hotel comprising a 253-room SpringHill Suites and a 147-room Residence Inn, in addition to approximately 27,000 square feet of retail space.

A major benefit of using AECOsim Building Designer was the ease with which John Portman & Associates could assemble a large and complex model in a way that allowed multiple team members to collaborate without bottlenecks. The teams shared and integrated data from various platforms – such as a structural model from Revit and landscape design files from AutoCAD – into 3D BIM created using AECOsim Building Designer.

John Portman & Associates | Songjiang, Shanghai, China
Shen Yuan Continuing Care Retirement Community





China's aging-population phenomenon is driving some families to rethink their living arrangements and elder-care options. Within a unique landscaped environment embodying a strong nature connection, Shen Yuan is a high-end retirement community in Songjiang designed by John Portman & Associates for a subsidiary of Taikang Life Insurance Company. The facility provides lifestyle retirement care, health care, education, and comprehensive services.

The project was so large that the size alone posed a challenge in components integration. The 3D model created in AECOsim Building Designer ensured a fully coordinated design that enabled John Portman & Associates to meet the highly demanding and sensitive design schedule. Quickly and easily defining the geometry and translating the design vision into a working BIM model freed the team from the tedium of 2D work to focus instead on the design.

John Wardle Architects and Terroir, in association | Hobart, Tasmania, Australia
Institute for Marine and Antarctic Studies





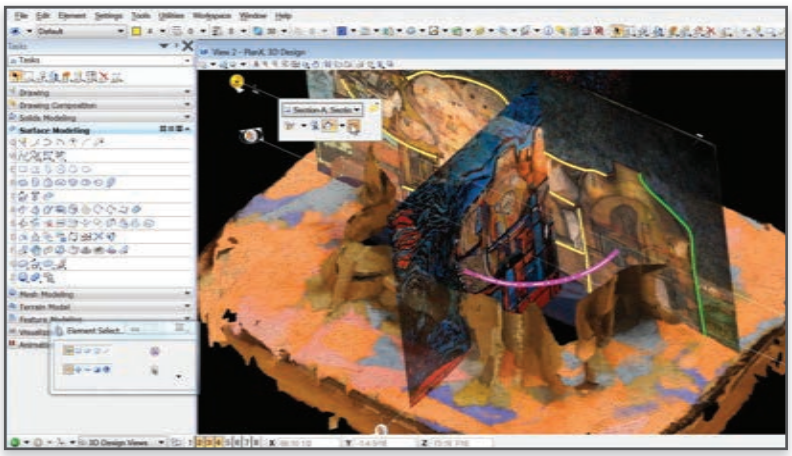
John Wardle Architects teamed with Terroir to create this AUD 45 million waterfront building in Hobart, Australia, to house the Institute for Marine and Antarctic Science, Integrated Marine Observing System, and Antarctic Climate and Ecosystems Cooperative Research Centre. The focus of ocean preservation and climate study drove sustainability initiatives across the building's layout, orientation, façade treatment, and material selection.

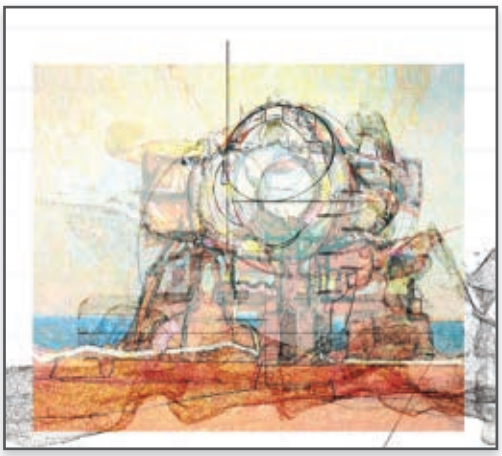
The main challenge was the laboratories, which have intensive mechanical engineering services and circuitous flue routes. Using MicroStation and AECOsim Building Designer, the BIM team modified shapes, sizes, and materials to evaluate potential impacts. Efficiencies derived from drawing extraction from a single model, as well as more comprehensive and accurate coordination of building structure and services translated directly into reduced costs of production and rework.

Innovation in Building

Mark O'Bryan, Hugo Mulder, and Rob Snyder | Sandestin, Florida, United States

House of the Rising Sun, Beach Center



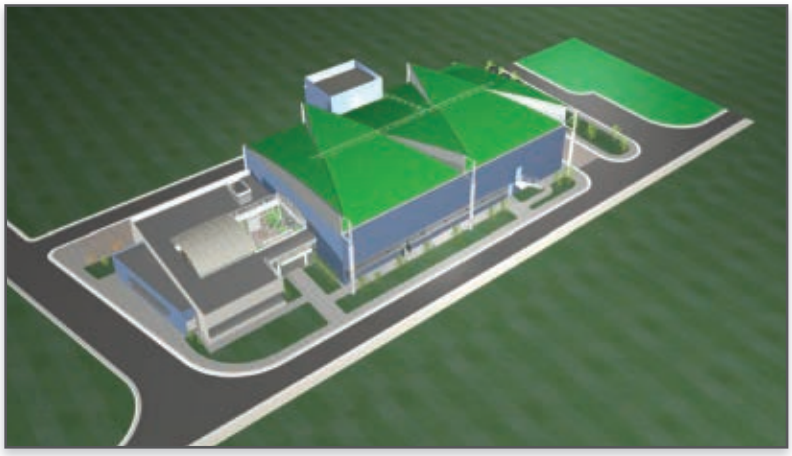


Although this USD 10 million project was proposed as an entertainment complex on the beach at Sandestin, Florida, it was also used to explore a design process that allowed the project team to more clearly understand and select design options by modeling within a hybrid data environment. By focusing on what matters most, the team improved efficiency both qualitatively and quantitatively.

MicroStation provided a unique ability to express, develop, and deliver a high performing design leveraging hybrid data types, all within the context of a model. The project team of Mark O'Bryan, Hugo Mulder, and Rob Snyder realized a complex design through a rich and immersive modeling environment that helped them more clearly realize a final design.

Poyry Tecnologia Ltda. and Orb Design Ltda. | Santa Cruz, Rio de Janeiro, Brazil

Procat Multipurpose Catalyst Laboratory



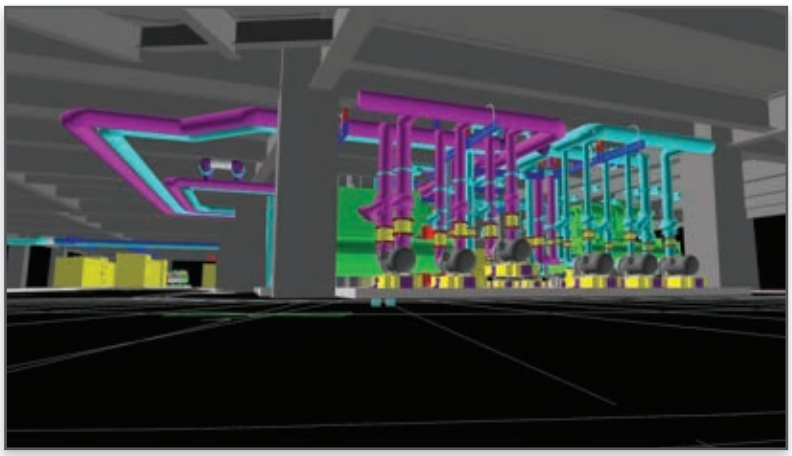


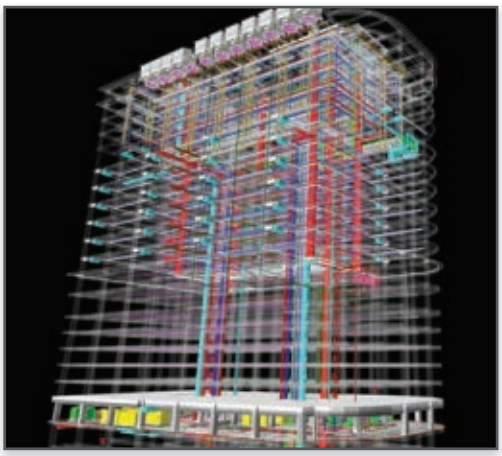
The goal of this BRL 15 million project by Poyry Tecnologia and Orb Design was to design a green building using sustainable design principles according to LEED certification requirements. A partnership between Petrobras and the Chemistry School at the University Federal Rio de Janeiro, the Procat Multipurpose Catalyst Laboratory is a center for biodiesel research and development in Santa Cruz, Brazil.

High temperature and moisture levels required a unique design for the roofing of the building. Using MicroStation, Bentley Architecture (now AECOsim Building Designer), and Structural Modeler, the Poyry Tecnologia and Orb Design teams extensively modeled and experimented with the peculiar geometrics of the laboratory, whose form is based on the spatial molecule design pattern of the chemical element called zeolith.

Ruentex Group | Taipei, Taiwan

CityLink SongShan BOT Project





The goal of this USD 130 million project was to renovate the SongShan railway station and a 21-floor multifunctional building for the Taiwan Railway Administration. Comprised of offices, retail establishments, and a hotel with total gross area of 115,779 square meters, the complex currently averages about 30,000 visitors a day. Once transformed into a mass rapid transit station, the number of passengers is projected to double.

Using AECOsim Building Designer, Bentley Navigator, OpenPlant, and Bentley Raceway and Cable Management, the Ruentex Group created multistage, data-rich BIM models for monthly design review and clash detection, prioritization of construction sequences and constructability reviews, and 3D auditing against physical models. The BIM approach was expected to decrease project delivery time by 15 percent.

Sigma Mascot (HK) Limited | Hong Kong, China

Pointools Innovation – Utilizing Technology to Preserve Our History





Hong Kong recently began updating and maintaining an electronic database of its historical buildings. Pilot projects were initiated to leverage point-cloud technology. But before creating a 3D model, Sigma Mascot needed to consider how to scan the especially fragile buildings. The solution for this HKD 300,000 project was to capture the point-cloud data and then import it into Bentley Pointools.

By deploying 3D scanning in conjunction with Bentley Pointools, Sigma Mascot no longer required a crew to do the survey on site. In addition, the highly efficient equipment reduced operational costs by providing an accurate 3D model with a less than 3-millimeter error rate on the data acquired. MicroStation then was used to rebuild the 3D model and save the files in DGN, 3D PDF, and video formats for inclusion in the database.

Innovation in Building

signum+ architects | Laakdal, Belgium

IOK Logistics Innovation and Training Center (LITC)



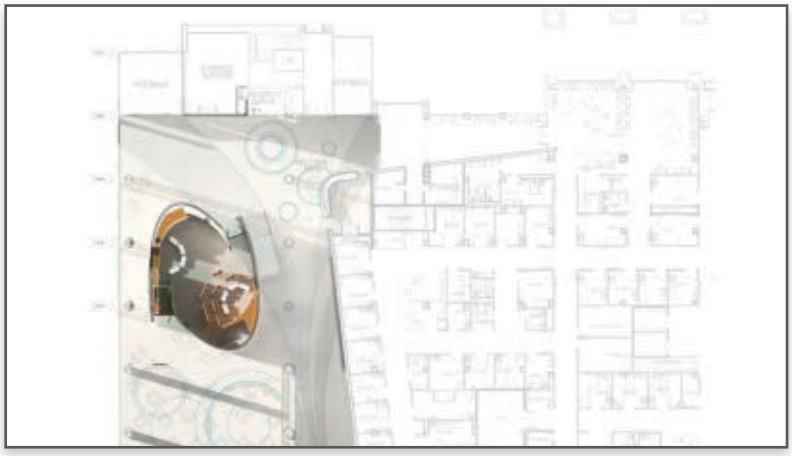


In 2012, Nike's European Logistics Campus, the Thomas More Bachelors School, and the KU Leuven University joined forces to create the nonprofit Logistics Innovation and Training Center in Laakdal, Belgium. The goal of this EUR 3.2 million project was to create a building that visually embodied innovative learning in an inspirational environment. The team received a BREEAM design score of 89.6 percent, one of the first buildings in Belgium to achieve this.

AECOsim Building Designer played a significant role as signum+ architects designed the complex 3D shape and curves of the building and the landscaping around it. The efficiency and time-saving process of creating drawings using dynamic views minimized potential failures in the construction phase to nearly zero, and the 3D visualizations created from the model were a great aid in explaining the design to the client and complicated details to the contractor.

Stanley Beaman Sears With WHR Architects and Overland Partners | San Antonio, Texas, United States

Children's Hospital of San Antonio

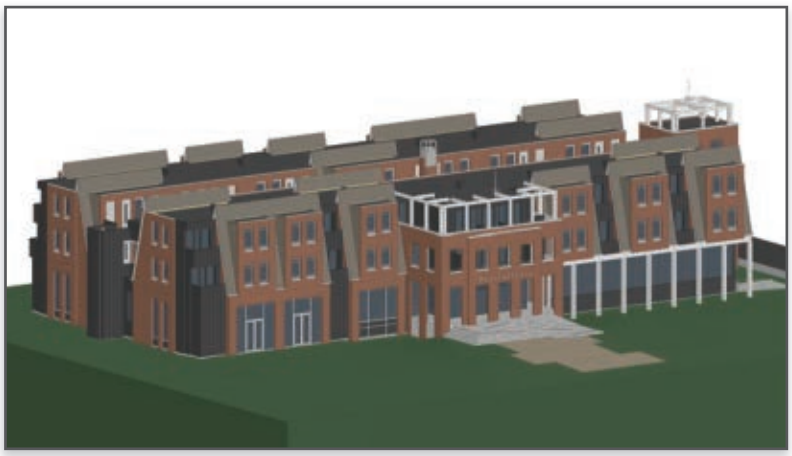




The Children's Hospital of San Antonio is part of the Christus Santa Rosa Health System in Texas. Stanley Beaman Sears, WHR Architects, and Overland Partners were tasked with the renovation of the hospital's 11-story bed tower and the addition of a new double-height lobby. The structural, mechanical, electrical, and plumbing coordination involved in renovating an existing building and updating it to current standards was a logistical challenge.

Stanley Beaman Sears used AECOsim Building Designer on this USD 130 million project, which enabled interoperability among consultants, contractors, and subcontractors. The chapel, for example, was a complex form that had a unique structural design. AutoCAD and Revit files were both sent to the structural engineer for calculation of the initial structural layout. MicroStation's clash resolution capabilities also helped find conflicts, inaccuracies in the existing drawings, and issues for construction.

Synargio Architects | Lunteren, Gelderland, Netherlands
Westhoffhuis



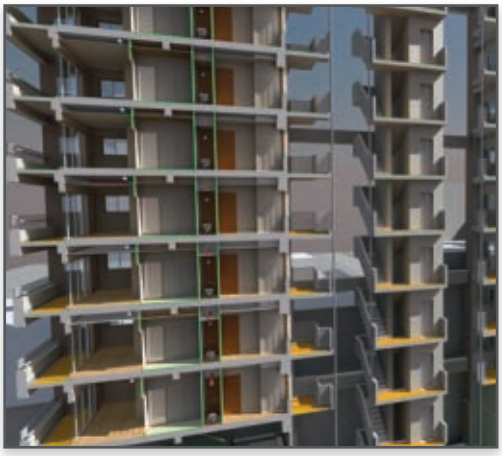


This project by Synargio Architects in Lunteren, Netherlands, was a cultural center that featured a public library, 28 apartments, and 45 parking places, half of which are below ground. With so many mixed uses on such a small site, the project quickly became complex. The design team's goal was to complete the project with no building errors.

Using MicroStation, Synargio Architects was able to model the EUR 4.4 million building exactly as a contractor would realize it, which provided accurate and limitless modeling options. The software's 3D capabilities enabled all participants – from managers to craftsmen on site – to visualize a complex structure that adds richness and diversity to the heart of the village.

Takahashi Architect Ltd. | Nagareyama, Chiba, Japan
Minami Nagareyama Apartment Project





For this JPY 850 million apartment building project, Takahashi Architect created a detailed design and specifications plan for the Minami Nagareyama complex in Japan. Using 3D BIM, the firm created a data model of the apartment design using Japanese specifications. This pilot project has enabled Takahashi Architect to more quickly estimate detail work at the final stages of basic design in all of its future projects.

Takahashi Architect used Bentley Architecture (now AECOsim Building Designer) to create a data model that was intended to be generic, but, in fact, corresponded to design diagram drawing specifications unique to Japan. As the model was refined and the rendering animation was added, it evolved into an integrated BIM model. Specific research was conducted by creating a sunshine/shadow animation to determine how sunlight exposure affected the units.

Innovation in Building

Takenaka Corporation | Toyota-shi, Aichi-ken, Japan

Yawaragi Mori no Stadium





Takenaka executed this 4,820-seat stadium project in Toyota-shi, Japan, on behalf of an auto parts manufacturing group as part of the client's 75th anniversary commemoration. Takenaka needed to complete this project in the ultra-short period of 9.5 months – 60 percent of the normal construction period. A current shortage of skilled construction workers in the Japanese construction industry demanded further efficiencies in manufacturing and on-site construction.

Using MicroStation and GenerativeComponents, Takenaka automated the 3D modeling of the Yawaragi Mori no Stadium which greatly reduced the labor required to produce drawings and eliminated human error from the modeling work. Rational fabrication and processing of complex steel framework components reduced costs by 10 percent. Parametric modeling reduced the labor required for modeling by 50 percent.

Special Recognition Award Winner Effective Strategies in Construction Modeling

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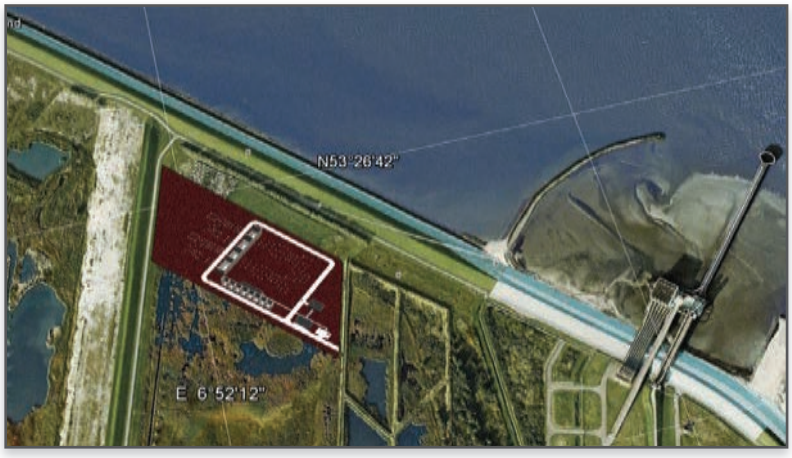
VMarchitectuur | Eemshaven, Groningen, Netherlands

Eemshaven Windfarm





The goal of this project in Eemshaven, Netherlands, was to design a cost-efficient substation for an off-shore wind farm project owned by Gemini. To design the sustainable wind energy infrastructure, VMarchitectuur needed to not only coordinate design disciplines for the structural and civil works requirements within a short period of time, but also had to keep costs in check.

VMarchitectuur reduced the delivery time of the EUR 3.5 million project by leveraging the user-friendly reference functionality of MicroStation and AECOsim Building Designer to exchange versions of AutoCAD DWG files. The interoperability capabilities of the software enabled the company to easily check information among disciplines.



Innovation in Construction

The projects in this award category exemplify excellence during the construction phase of a project, demonstrating a clear return on investment through accelerated project schedules, improved safety, and reduced risk, and how the use of technology has advanced work processes, especially with the construction workforce, to the benefit of all stakeholders.

Innovation in Construction

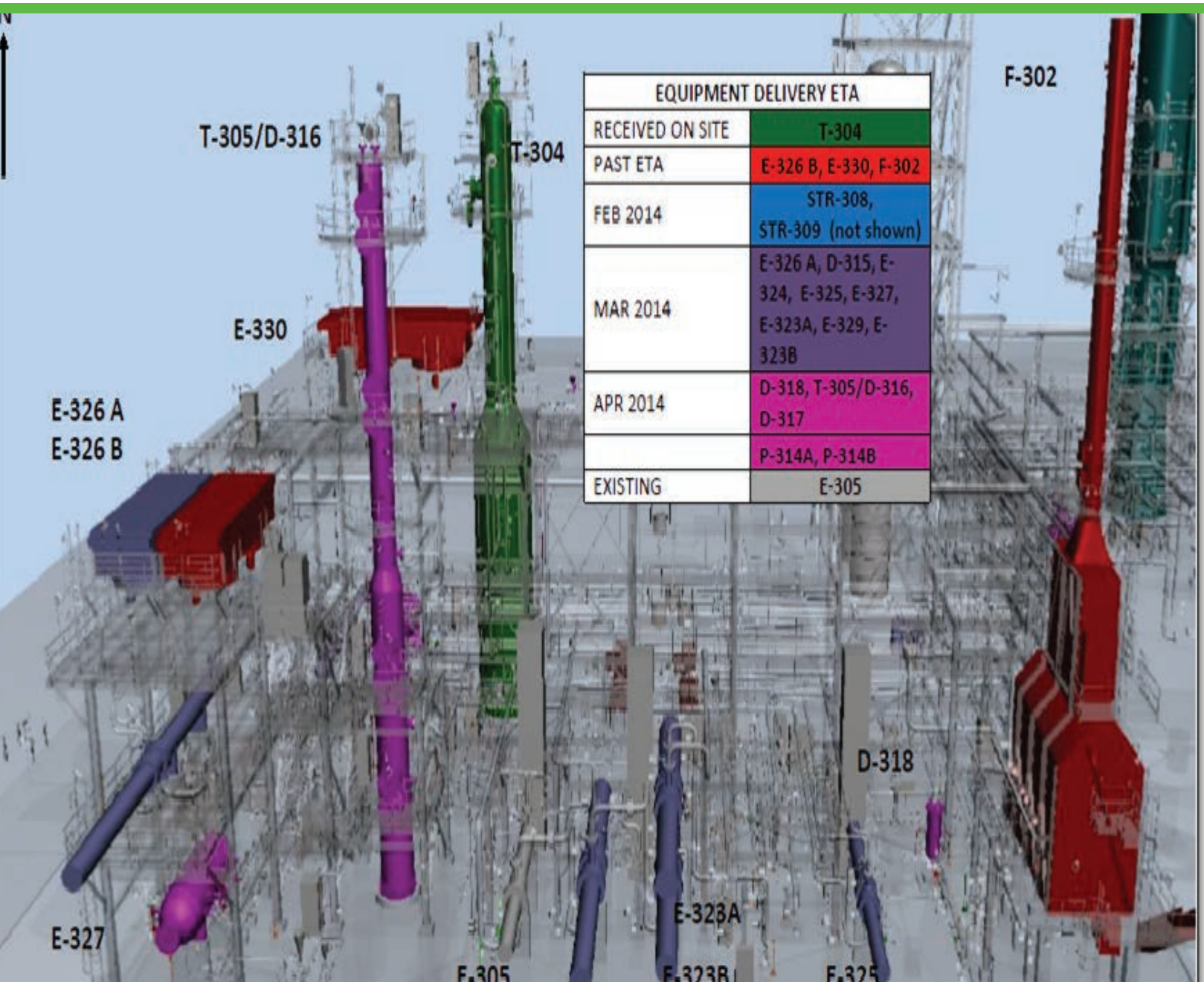
WINNER

Jacobs | Houston, Texas, United States

EPC Success Using ConstructSim

Jacobs is one of the world's largest and most diverse providers of technical, professional, and construction services. In 2013, Jacobs expanded its use of ConstructSim to include centralized workface planning for multiple projects. Whereas a dedicated workface planner is traditionally employed for each project, using ConstructSim Jacobs is able to support 14 projects with 19 models, all managed by just one workface planning manager and one ConstructSim administrator. Projects ranged in value from USD 120 million to USD 670 million.

Coaching engineers on the information details needed for the PDS and PDMS models created more complete ConstructSim models. Jacobs successfully completed automated data exchanges for real-time status reports on engineering, materials, vendor fabrication, drawing transmittals, schedule, productivity, and the turnover system. The reduction in dedicated workface planning managers on individual projects saved over USD 1 million, while standardization of project setup saved approximately USD 460,000.





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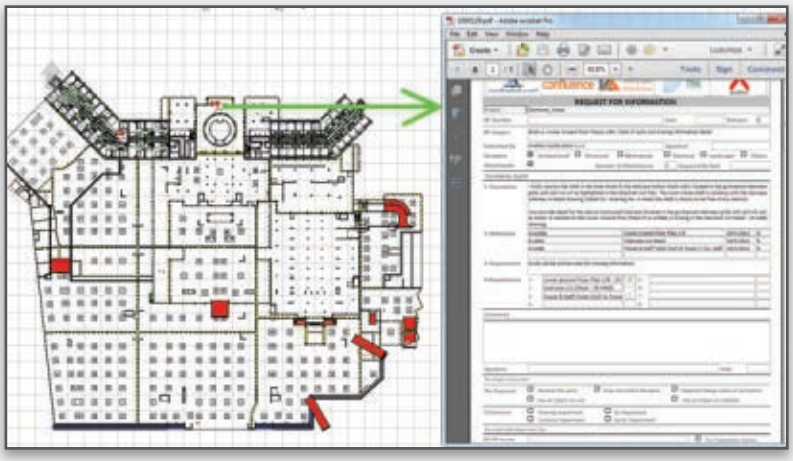




FINALIST

Arabtec Construction LLC | Abu Dhabi, United Arab Emirates
Fairmont Hotel

The USD 220 million Abu Dhabi Fairmont Hotel, located in the prime breakwater district with extensive beach frontage, included a five-star resort, apartments, soccer field and grandstand, retail outlets, and ancillary buildings. The built-up area totaled approximately 1.9 million square feet, with two towers rising more than 38 stories. Bentley i-model technology reduced the planned 30-month project duration by 1,000 man-days and cut delivery costs by 30 percent.

Arabtec Construction's BIM department developed and stored a total of 1,240 i-models. All of the engineering data and information in the i-models was also extracted and stored in a SQL database accessible by different departments and site teams. This allowed 4D and 5D integration to simulate different construction scenarios, identify possible hazards, and improve site management from tender through construction stages. Auto-generated i-models are estimated to have reduced operations costs by 30 percent.





FINALIST

Michigan Department of Transportation | Michigan, United States
ProjectWise: A Change in Construction

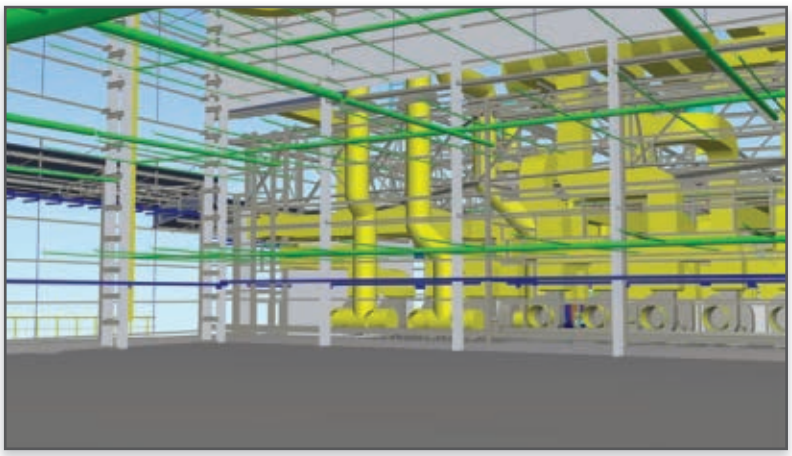
This project transformed the way the Michigan Department of Transportation (MDOT) documents construction projects – from a paper-based system to a fully electronic system using ProjectWise. With approximately 400 trunkline construction projects, the department needed to virtually connect the MDOT staff involved with the construction process to the project stakeholders, including contractors, suppliers, construction managers, inspectors, and auditors.

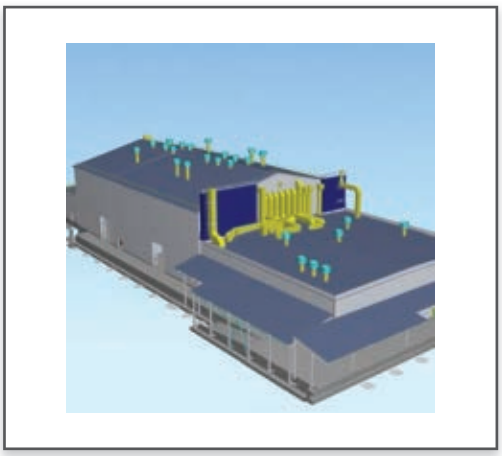
After using ProjectWise in design for more than 11 years, MDOT tested its application to construction with four pilot projects totaling USD 130 million in infrastructure. Implemented at minimal cost, this project eliminated paper by mandating electronic submittal and storage of construction documents. Using electronic documents cut 30-day approval times to an average of three days. In addition to a projected savings of 6.7 million pieces of paper per year, annual statewide savings in mail-related costs alone were estimated at USD 7.45 million.

Special Recognition Award Winner Advancing Information Technology

Innovation in Construction

Bashgiproneftekhim SUE | Russia
Warehouse of Spent and Fresh Catalysts





The warehouse of spent and fresh catalysts in Russia is part of a large petrochemical enterprise whose goal for this project was to increase the volume of primary production and reduce any harmful impact on the environment. The project also aimed to reduce the adverse environmental impact of chemical product storage on employee health.

Bashgiproneftekhim used Bentley PlantSpace, ProjectWise, and Structural Modeler, which together enabled the project designers to carry out parallel operations, shortening not only the time for implementing the project, but also the time needed to correct detected clashes. The timely detection and correction of conflicts during the design reduced risks during the construction phase.

Carsten Roth Architekt | Berlin, Germany
Kunst Campus at the Hamburger Bahnhof





This housing, gallery, and office development project in a prominent location on the banks of the Spandau Shipping Canal in Berlin, Germany, presented a challenge in terms of collaboration among architecture, structural design, and building services. The exchange of data in DGN, DWG, and DXF formats was necessary to ensure the interdisciplinary collaboration of all participants of the Kunst Campus project.

MicroStation PowerDraft enabled Carsten Roth Architekt to execute the complex construction project from concept to construction-readiness rapidly and effectively. A 3D model of the project was produced quickly, and an integrated Web server enabled all designers to have easy access to the current designs. The software provided a smooth exchange of architectural and structural data so internal technical requirements could be clarified expediently.



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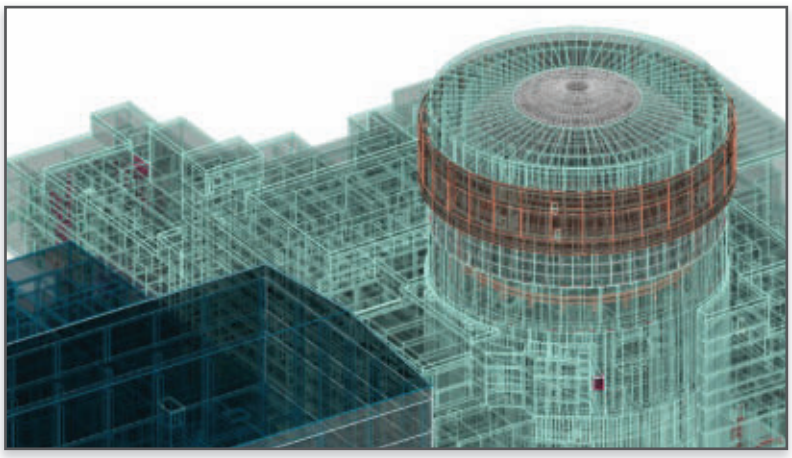
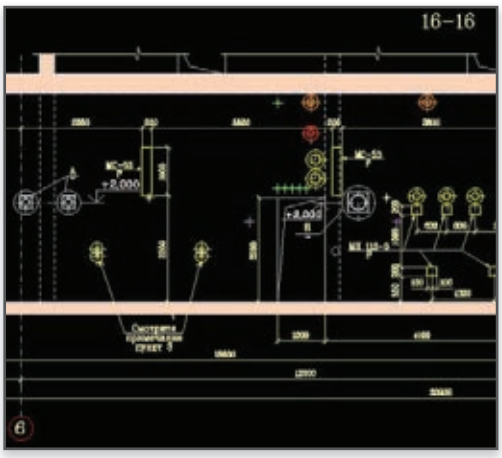
Golovnoi Institut VNIPIET LLC | St. Petersburg, Russia

Multiprogramming Environment of SPbAEP for Structural Design





Since the beginning of the Tyanvansk NPP project in 1998, SPbAEP has been using 3D design modeling for reinforced concrete structures. A branch of Golovnoi Institut VNIPIET in St. Petersburg, Russia, SPbAEP continues to set new standards by implementing design automation using software tools designed to simplify the work of design engineers, and, in so doing, to enhance productivity and improve the quality of documentation.

SPbAEP uses MicroStation to produce 3D designs, and Bentley speedikon Architectural to develop the 3D model of building structures and generate data for use in working documentation. The comprehensive solution for all phases of the design process – from the development of a conceptual model to the production of working drawings and manufacturing designs, work-load estimates, and transmissions to the cost estimate systems – reduced the project implementation period by 25 percent.

Henan Water & Power Engineering Consulting Co., Ltd | Xianyang, Shaanxi, China

Qishuihe River Inverted Siphon Reconstruction Project





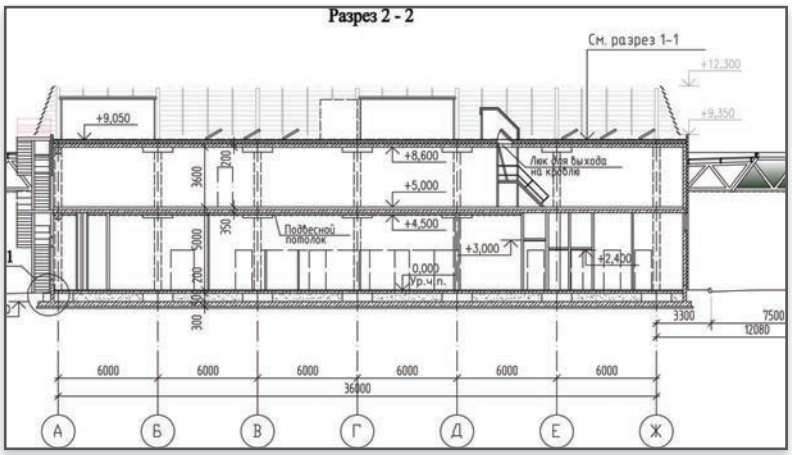
The goal of this reconstruction project in Xianyang, China, was to upgrade the existing irrigation system to increase safety for 1,000 people in surrounding villages and to provide irrigation capabilities for 777,000 mu (approximately 51,800 hectares) of farmland in eight counties and/or districts. A unique challenge of this CNY 55 million project was the three types of aqueducts that had to be constructed and installed within a limited time.

All departments and disciplines throughout Henan Water & Power Engineering Consulting Co. communicated through ProjectWise and Bentley Navigator, saving about CNY 50,000 in communication costs while improving overall communication efficiency and quality. To save time on the aqueduct design options, the teams simulated construction under various working conditions to anticipate and reduce construction difficulties.

Innovation in Construction

PI JSC and the VT Lenaeroproekt Research Institute | St. Petersburg, Russia

Engineering Data Management System and Design Documentation in Electronic Form Using ProjectWise



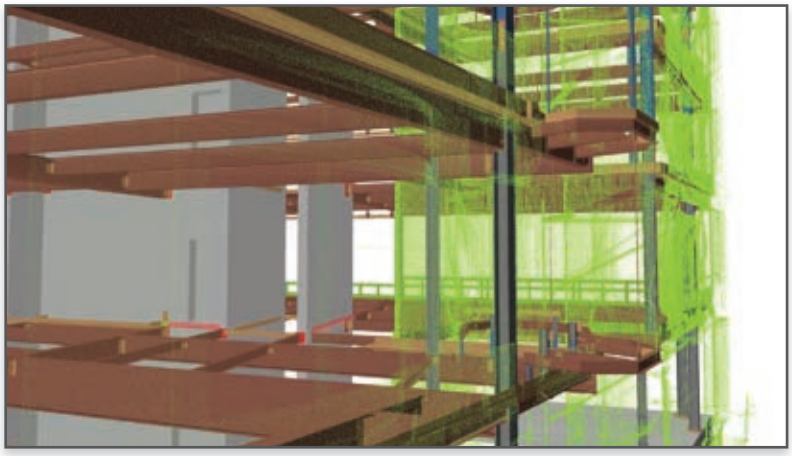


The goal of this RUB 6 million joint project by PI JSC and the VT Lenaeroproekt Research Institute in St. Petersburg, Russia, was to implement a single, integrated environment that would provide systems engineering data management and manage electronic engineering design documentation. Production activities at VT Lenaeroproekt Research Institute include a wide range of development work for the construction and reconstruction of airport facilities.

ProjectWise Explorer Mobile was chosen as the platform for the transition to electronic document management. The software enabled third-party developers to integrate services for the design of the system and subsystem, and development of components. ProjectWise also monitored shared access to data on the project, and provided general access to the data for the partners of the project, resulting in efficient interaction.

Shawmut Design and Construction | Boston, Massachusetts, United States

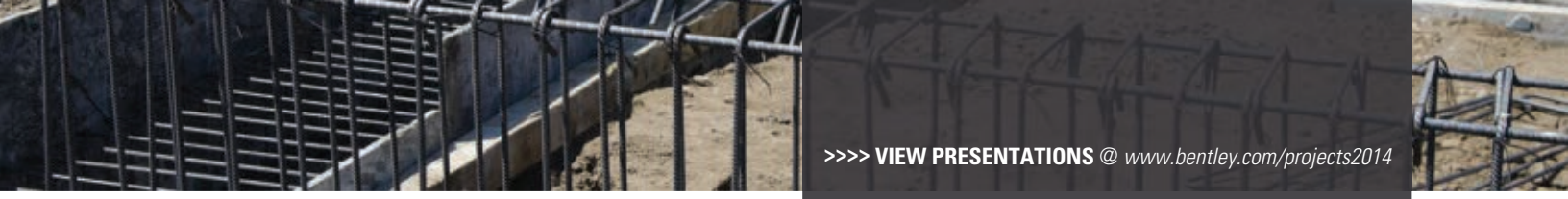
Dudley Square Municipal Building





The goal of this USD 98 million project was to provide Boston, Massachusetts, with a world-class structure as well as a data-rich environment to manage it. An integral element in the revitalization of a once-thriving section of Boston, the Dudley Square Municipal Building is situated at the intersection of major auto, mass transit, and pedestrian thoroughfares. The construction also encompassed the integration of three existing historic structures.

Shawmut Design and Construction used ProjectWise to create a more interactive and aggressive approach to multidiscipline collaboration at key points in the project. As project-specific information became available and was finalized throughout construction, processes were catalogued for future reference, allowing the owner to not only access and review it during the project, but also to use it for the operations and maintenance of the building in the future.



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SpawGlass | San Antonio, Texas, United States

Frost Westover Hills Office Building and Parking Structure





Featuring two water fountains, walking trails, and a sports court, the Frost Westover Hills office and parking complex in San Antonio, Texas, sits on a 16.7-acre site. The building is comprised of a structural steel frame, drilled pier foundation, and glass-curtain wall exterior skin with an asphalt membrane roof. The scope of work included the interior build-out with an air-cooled, chilled-water HVAC system and state-of-the-art electrical system.

The project had an extremely demanding schedule, requiring the first handover to be made to the owner within 445 days of breaking ground. SpawGlass used Bentley Navigator on mobile devices and tablets to provide quick access to project documents for project team members and stakeholders, which minimized the delays that often occur when information and/or changes are transmitted among the design teams and subcontractor teams.





"Bentley provided a flexible, extendable, and robust platform for content creation and project information management with i-models at the heart."

– Ahmed Balawi, BIM Manager, Arabtec Construction



Innovation in Government

The nominations in this category have demonstrated excellence in local, state, provincial, federal, and national government projects. Such projects may leverage Bentley's engineering and geospatial applications across the breadth of disciplines used by governments. They may also feature government projects involving BIM, project delivery, and asset lifecycle information management.

Innovation in Government

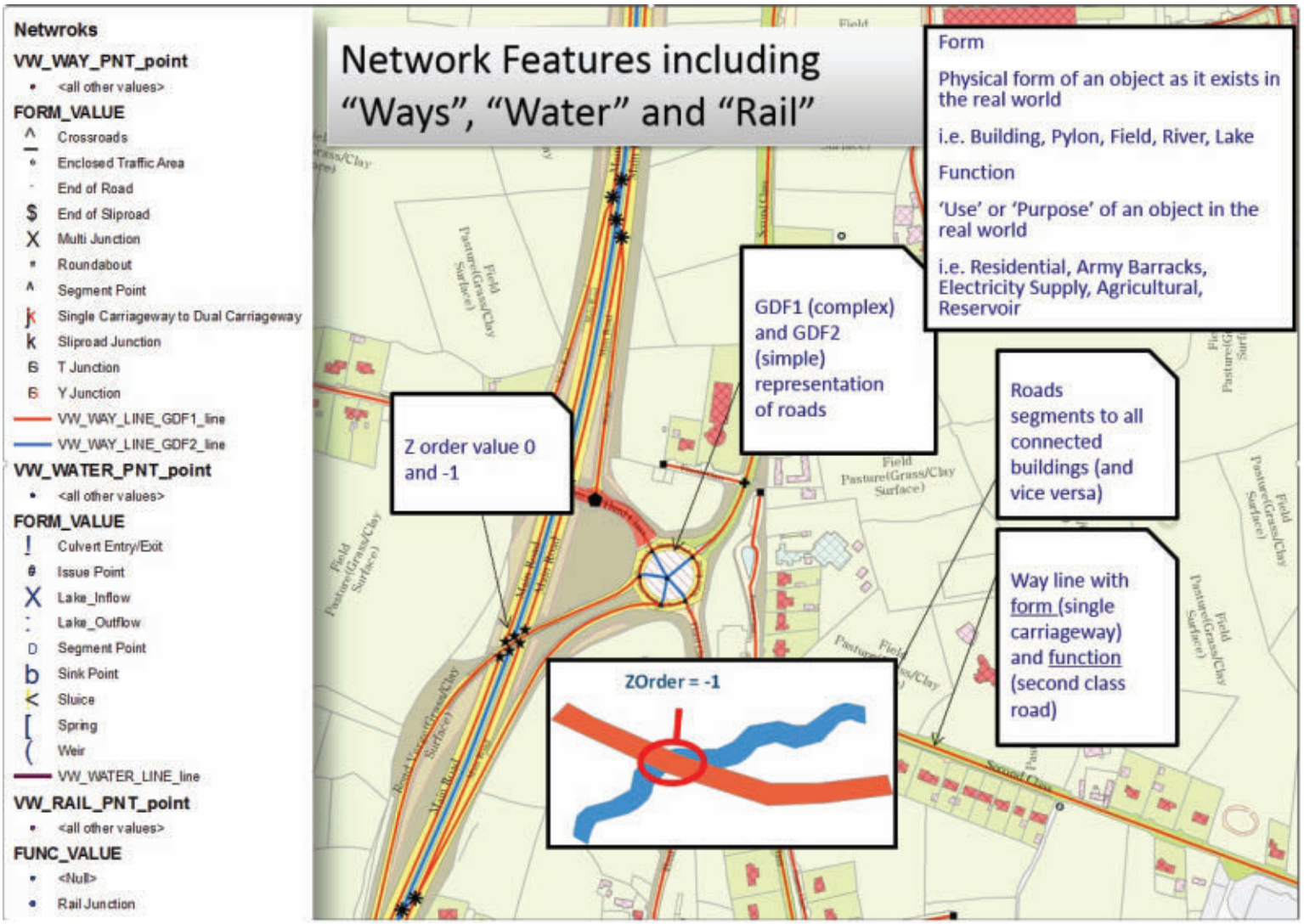
WINNER

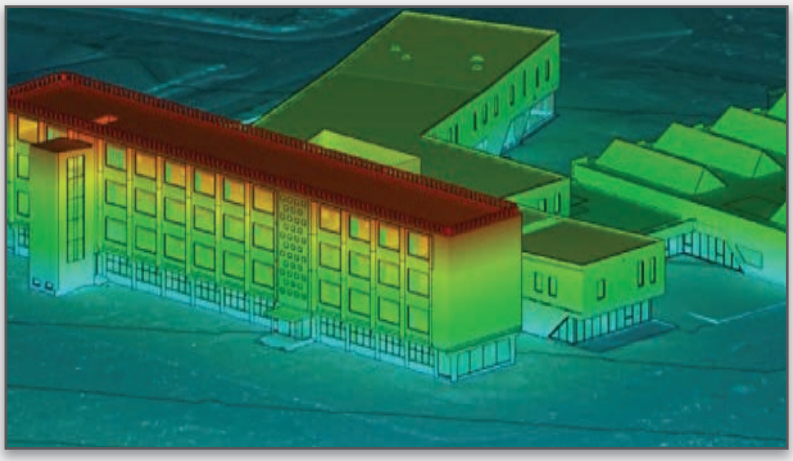
Ordnance Survey Ireland | Dublin, Ireland

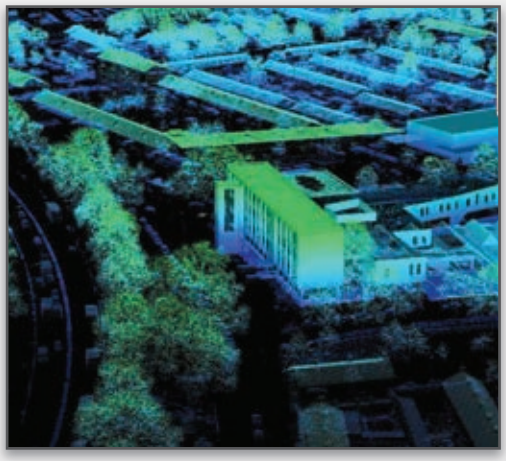
A New Authoritative Spatial Data Infrastructure for Ireland

Ordnance Survey Ireland (OSi), the national mapping agency, has developed a standardized, authoritative digital referencing framework that enables consistent referencing and integration of national data related to location. This visionary program enabled OSi to move from cartographic objects to real-world objects in a framework, known as Prime2, that allows data users to accurately integrate and use multiple data sources for improved analysis and decision-making, resource optimization, and efficiency gains.

Six years in the making, the new spatial data referencing platform is an object-oriented, digital mapping data model that provides for the maintenance and development of the underlying physical infrastructure of Ireland. It enables geographic objects such as utilities, land parcels, roads, and buildings to be uniquely identified and referenced. Bentley Map, along with some OSi-specified customized tools, allowed the agency to manipulate the re-engineered data. The EUR 4 million project saved more than EUR 600,000 in operating costs and has established OSi as a true leader in spatial data infrastructure. The project also provides the foundation for the build-out of intelligent infrastructure in Ireland.







FINALIST

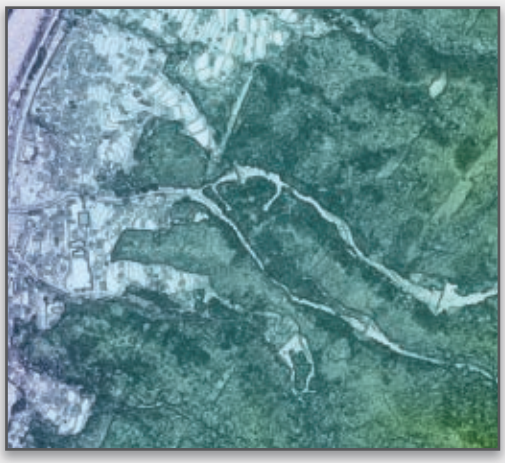
City of Eindhoven | Eindhoven, Noord-Brabant, Netherlands

3D City and IFC Integrated

The City of Eindhoven, Noord-Brabant, Netherlands, is achieving its vision of becoming a smart city by applying a BIM lifecycle approach to the city's infrastructure. The smart-city strategy combines data from multiple disciplines in a 3D city model, and allows open data use by developers and architects. This makes projects less costly and more efficient, enables better collaboration between citizens and the city council at the beginning of projects, and ultimately improves the quality of life for the citizens of Eindhoven.

With financial support from the province, the City of Eindhoven invested EUR 30,000 to build a 3D city model. The City of Eindhoven combined this city model into a 3D data model with the use of point clouds, scalable DTMs, subsurface objects such as 3D sewerage, and i-models for easy access of BIM models. This unified data model is called the Gebiedsmodel. Bentley Descartes, Bentley Navigator, ProjectWise, MicroStation, and an i-model plugin were used in the process.





FINALIST

Kokusai Kogyo Co., Ltd. | Nagano Prefecture, Japan

Disaster Prevention and Risk Reduction Project

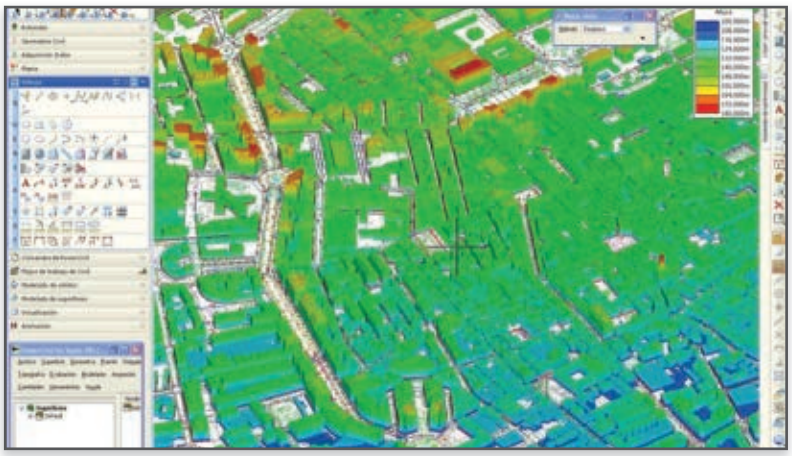
The Regional Development Bureau for Nagano Prefecture, Japan, retained Kokusai Kogyo Co., Ltd. for a JPY 20 million project to help prevent disasters and reduce risk in the event of a natural disaster. The goal was to develop a system for quickly understanding the extent of the damage and creating a rapid response base map to reduce the risk of secondary damage.

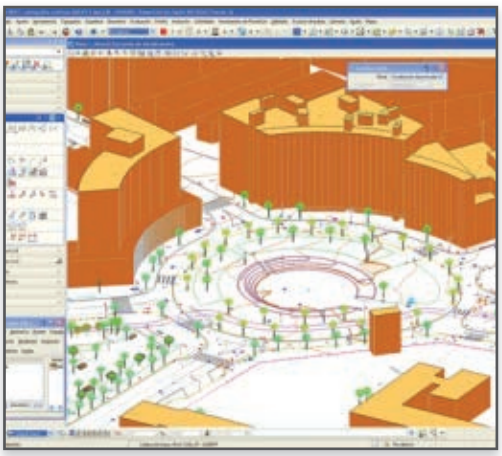
The solution was to use airborne LiDAR data to create a post-disaster topographic map within two months of the disaster, a process that takes four to six months using conventional surveying methods. Bentley Pointools and MicroStation provided the required dense point-cloud handling, manipulation, and analytic functions. This approach enabled comprehensive information collection and yielded the necessary geospatial insights for recovery and reconstruction work. Kokusai Kogyo's solution cost 60 percent less compared to conventional solutions.

Innovation in Government

Ayuntamiento de Reus | Reus, Catalonia, Spain

Generation of 3D Maps for the City of Reus



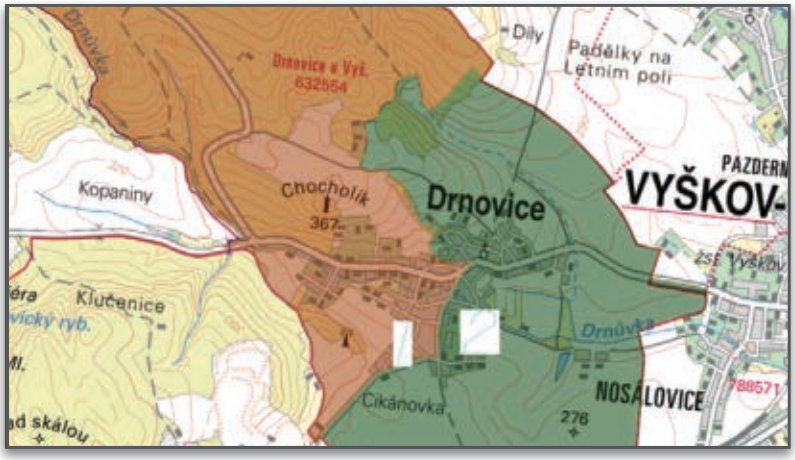


The goal of this EUR 3,500 project was to design two municipal maps at scales of 1:500 and 1:1000 for the city of Reus in compliance with the Cartographic Coordination Commission of Catalonia (Spain) regulations. To be published in the Official Register, the maps had to be 3D, which involved geometric purification, and adjustment and updating of the municipal cartography so that constituent elements were given digital "z" components (lines, points, symbols, etc.).

Performing the mapping on MicroStation ensured that the maps would be fully integrated and operational with other vertical applications such as Bentley Map and InRoads. Converting the maps to Google Earth format provided a free, non-CAD platform accessible via the Internet and intranets. This allowed the general public to use the display without requiring knowledge of design programs, CAD, or GIS.

Czech Office for Surveying, Mapping and Cadastre | Prague, Czech Republic

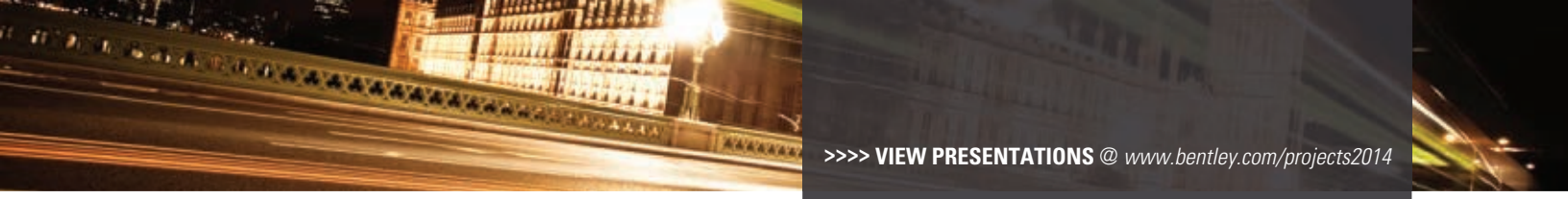
GIS Governs Czech Election Districts





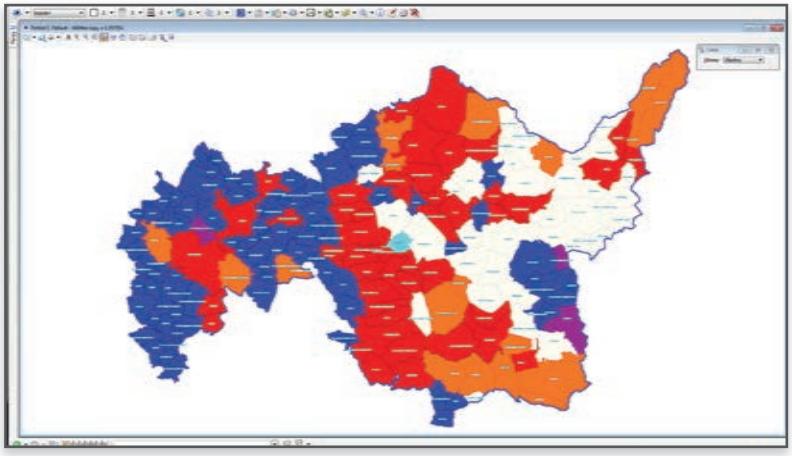
The Czech Republic established election districts as spatial mapping objects that had to be defined, clarified, and maintained in the national Informational System of Czech Territorial Evidence, operated by the Czech Office for Surveying, Mapping and Cadastre (CUZK). Within 14 months, CUZK collected information from all governments and municipalities (6,253 urban areas) and prepared proposals of continuous election district boundaries for ratification.

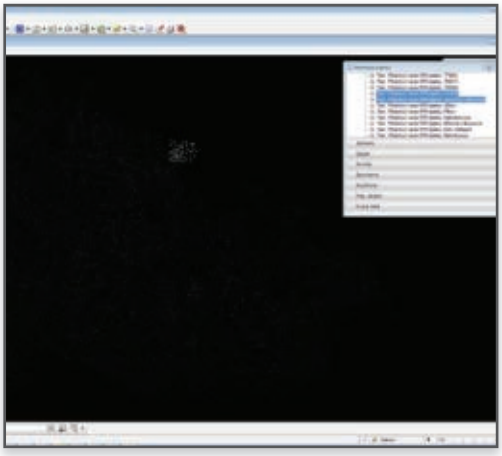
An information system was developed for election district data and integrated with governmental information systems (e.g., land registry). Bentley software's interoperability allowed CUZK to work with mapping inputs in various vector and raster formats. The new system provides a centralized store of election district data and controls the update process. Organizations can perform demographic or social spatial analysis within the election district layer, and citizens can determine their own election districts.



Czech Office for Surveying, Mapping and Cadastre | Prague, Czech Republic

XFM Elevates Richness of Cadastre Data





The Czech Office for Surveying, Mapping and Cadastre (CUZK) operates the Informational System of Czech Real Estate (ISKN), a centralized database of spatial and administrative information about every land parcel within the Czech Republic. The outdated ISKN data model did not correspond to current spatial database standards. It took days to deliver information for a single cadastral area. CUZK needed to update the data to current standards.

CUZK implemented Bentley Geospatial Server with an Oracle connector and DGN/XFM schema to automatically generate graphical data for all 97 regional offices (13,099 cadastral areas). Three monthly analyses report the current status of data digitization for each cadastral area, cadastral boundaries based on quality and origin of measurement, and spatial definitions of cadastral areas. These tools save an estimated five man-days per month.

Development Office of Gdańsk | Gdańsk, Poland

Analysis of the Tram Line in Downtown Gdańsk





Gdańsk is Poland's principal seaport and the center of the country's fourth-largest metropolitan area. The Development Office of Gdańsk undertook this project to explore the feasibility of introducing a tram line in the historic district of central Gdańsk. The premise was that a tram line would revitalize this part of the city by improving mobility for residents and attracting tourism.

A detailed 3D city model that covered both terrain and buildings aided in the analysis of how the tram line could be adapted to the existing infrastructure, while minimizing the impact on historic areas. The model also illustrated new development that would accompany the tram line. Bentley software enabled the translation of project assumptions into a 3D model.

Innovation in Government

Larimer County | Fort Collins, Colorado, United States

Road Information Locator



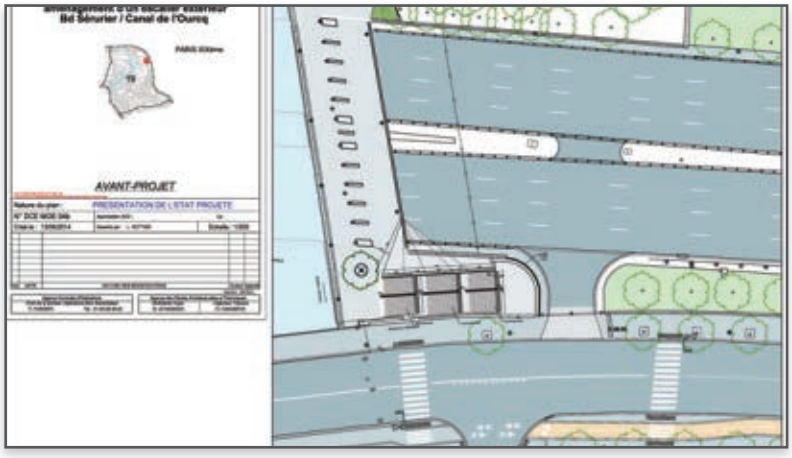


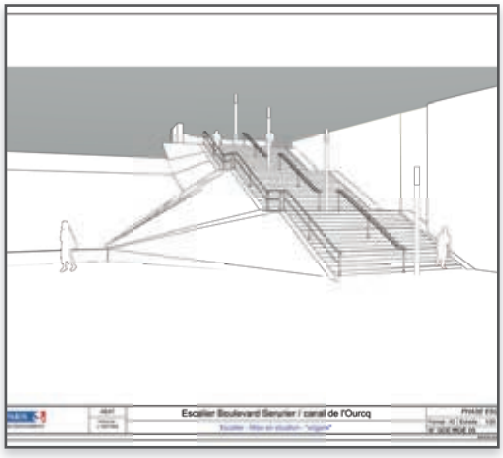
Larimer County, Colorado, completed a USD 128,500 project to develop a road information locator (RIL) that makes authoritative road asset and enterprise GIS data accessible to county employees and the public. The RIL uses a graphical, point-and-click online interface with interactive maps, textual search, and analysis tools. It eliminates the inefficiencies that occurred when information requests went through technicians operating separate systems.

Exor's Linear Referencing System provided the tools needed to integrate roadway assets with the linear roadway network. The normalized data provided the basis for integration with the county's spatial data sets. Exor's sophisticated data analysis tool enabled delivery of information and aggregated data sets for analysis in the RIL. The RIL has become a valuable tool for transportation planning, asset management, and public safety.

Mairie de Paris | Paris, France

Philharmonie



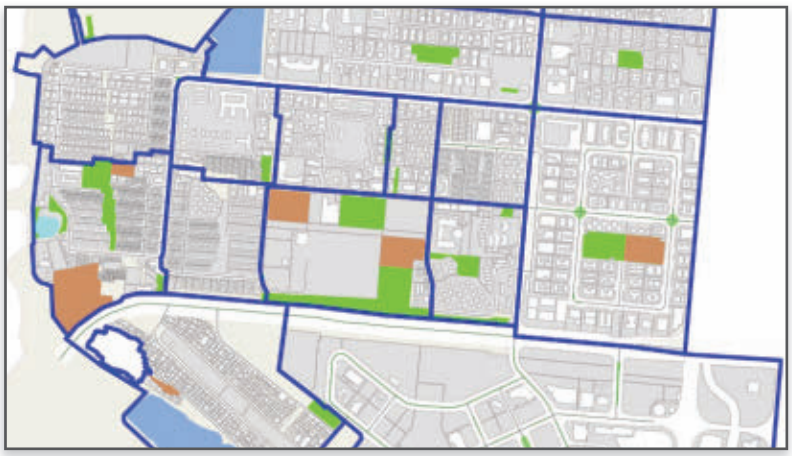


This EUR 1.5 million project involves the development of public roadway spaces bordering on the Philharmonie de Paris (Paris Philharmonic Hall). These improvements are a natural continuation of those already completed in conjunction with the extension of the T3 tramway line serving the hall, which is slated for completion in January 2015. They include approaches to facilitate public access and ensure the safety of pedestrians.

Site constraints in this high-traffic environment, combined with overlapping phases of roadwork and a short five-month construction timeframe, were the primary challenges. Bentley software provided a basis for developing 2D and 3D plans for consultation and communication with project partners and stakeholders. The automated features and specific functions of PowerCivil for France saved the design teams many hours of work.

Navi Mumbai Municipal Corporation | Navi Mumbai, Maharashtra, India

Creation of Urban Base Map, Contour Maps, Infrastructure Maps, and Database Using GIS GPS Technology



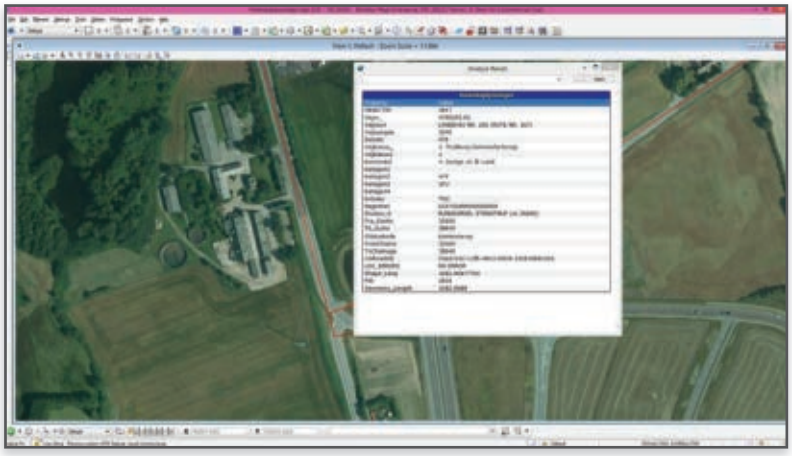


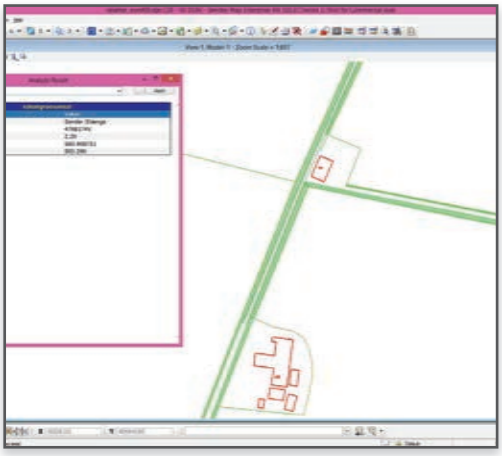
For this INR 10 million project, Navi Mumbai Municipal Corporation (NMMC) created a Web-based database for viewing all assets in the Navi Mumbai area, located in Maharashtra, India. This online system has improved property tax collection for the municipal corporation. With optimized project delivery costs, NMMC achieved project payback within a six-month period.

The project involved the collection of survey data for more than 350,000 properties, import of differential global positioning system (DGPS) survey data for 172 square kilometers, and integration with existing and planned infrastructure data. From this data, NMMC created an urban base map, contour maps, infrastructure maps, and a database using GIS/DGPS technology. Using Bentley Map reduced design time, improved the level of precision, and accelerated the generation of drawings, profiles, and reports.

Svendborg Kommune | Svendborg, Denmark

Registration of Roads in SQL Spatial Database in Bentley Map





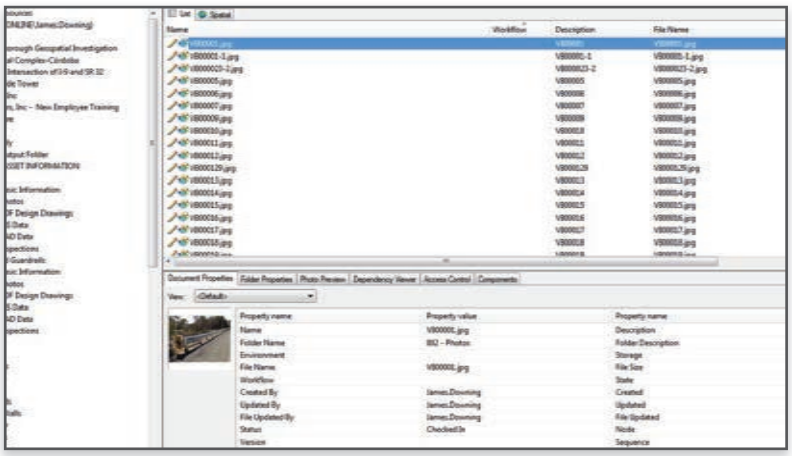
This DKK 1 million project involved registering approximately 850 kilometers of roads in Bentley Map for the municipality of Svendborg, Denmark. Data on center lines, road widths, coating types, road signs, and other features were recorded in the Danish layer model and stored in a SQL spatial database. This enabled the municipality to access the data in Bentley Map as well as via other GIS systems.

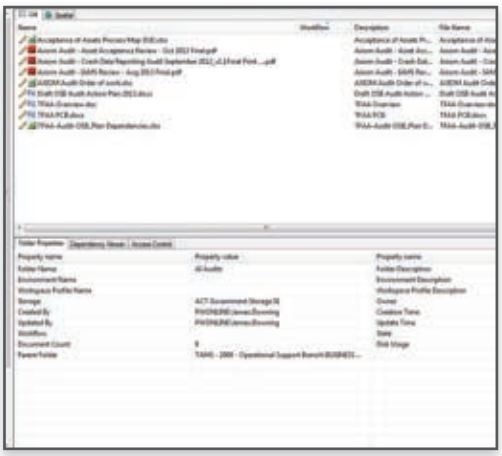
Accurate registration of the road data saves time and resources when pulling information needed to perform road maintenance. Data can be easily exported to spreadsheets for contractor access. Bentley Map Mobile allows personnel to access data from the field, even when they are offline. The efficiencies introduced by this project will ensure that project costs are recouped within two years.

Innovation in Government

Territory and Municipal Services | Canberra, Australian Capital Territory, Australia

An Agile Hosted ProjectWise Implementation in a Government Setting





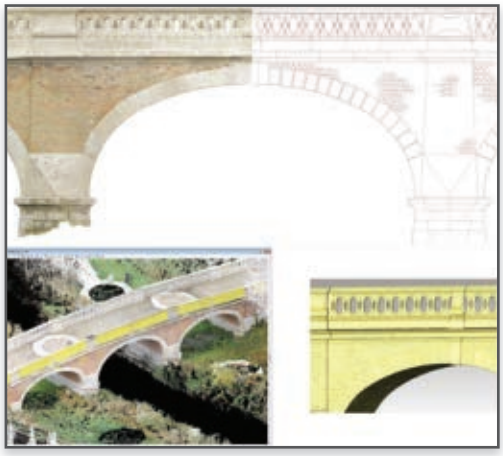
As a Directorate of the Australian Capital Territory (ACT) Government, Territory and Municipal Services (TAMS) delivers a wide range of services for the citizens of Canberra. The goal of this eight-week agile project was to establish ProjectWise in a Bentley-hosted environment that will foster information sharing and create a partnership between local government and engineering firms working on infrastructure projects.

ProjectWise was deployed to 50 users, including three administrators, and configured for the Traffic Control Device project submission and approval process. This will enable greater efficiencies and reduce down-time on each project. The hosted cloud solution provided a highly secure environment that is accessible off site through the ProjectWise Web Server interface. Using ProjectWise workflows has reduced document handling times, project delivery times, and project costs.

The Monuments Board of the Slovak Republic | Bratislava, Slovakia

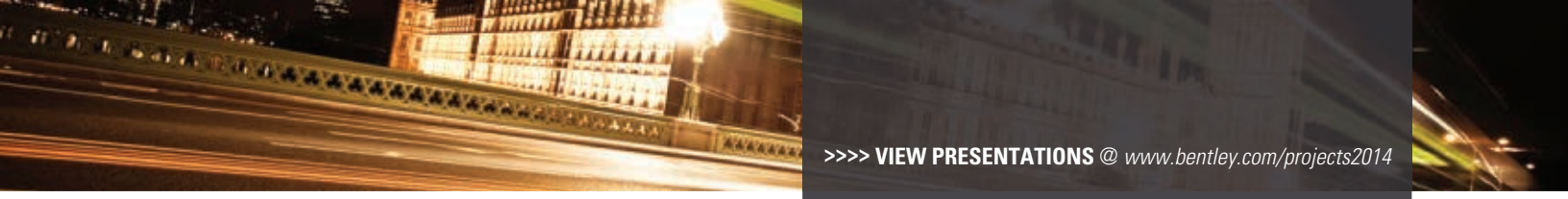
Digital Monuments Fund





To conserve heritage sites that celebrate and symbolize Slovak history, the Monuments Board of the Slovak Republic undertook the digitization and documentation of 2,000 monuments in Slovakia. The EUR 9.33 million project created a digital archive of objects as a reference in case of damage or destruction. Using laser scanning and digital photogrammetry instead of traditional survey methods produced a greater quality and quantity of data.

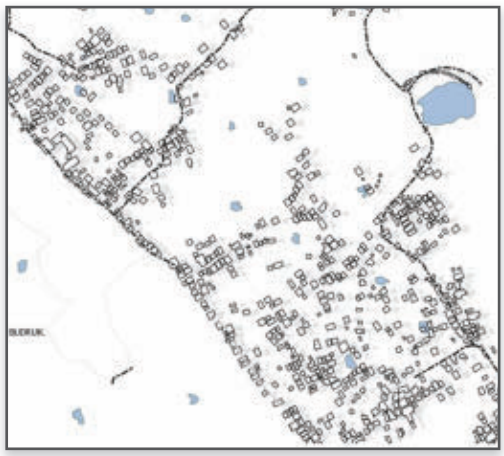
The Monuments Board used PowerCivil for Czech Republic to work with point clouds and georeferenced images. Compared to traditional methods of acquiring survey data, the noninvasive techniques took less time and reduced costs associated with building scaffolding, modifying terrain, and other steps required to access measured objects. Considering both data acquisition and processing, Bentley products enabled the work to be completed 10 times faster.



Vasai Virar City Municipal Corporation | Thane, Maharashtra, India

Implementation of Property Tax Reforms for Vasai Virar City Municipal Corporation





The INR 10 million implementation of property tax reforms for Vasai Virar City Municipal Corporation was intended to increase revenue for the municipal corporation, which governs this suburb of Mumbai, Maharashtra, India. The project involved the survey of 500,000 properties, import of Differential Global Positioning System survey data for 364 square kilometers, and integration with existing and planned infrastructure data.

Bentley Map was instrumental in the integration and design of data from diverse sources in order to quickly generate drawings, profiles, and reports. The software substantially reduced man-hours required for data input, resulting in optimization of project delivery costs. Creating a Web-based database for viewing all assets in the Vasai Virar area improved property tax collection significantly. The system paid for itself within six months.





"Ordnance Survey Ireland (OSi) has developed a standardized, authoritative digital referencing framework that enables the consistent referencing and integration of national data related to location. Bentley's commitment to providing the tools necessary for 21st century design means that OSi can confidently maintain the integrity of its core data in an efficient manner to meet modern demands."

– Andy McGill, OSi



Innovation in Land Development

The projects in this award category have demonstrated excellence in planning, civil, environmental, and geotechnical engineering, analysis, design, and management of site projects for airports, buildings, plants, environmental, commercial, or governmental campuses.

Innovation in Land Development

WINNER

Cathie Associates | Montevideo, Uruguay

Montevideo Multipurpose Harbour

On this project for the National Ports Administration of Uruguay, Cathie Associates was contracted by construction consultant Soletanche Bachy Argentina to evaluate issues encountered during the construction of dock foundations. The new docks are part of enhancements to the Port of Montevideo. The main engineering challenge was the hard ground conditions that caused problems during the installation of foundation piles.

As part of this USD 73 million project, Cathie Associates reassessed the soil profile and engineering parameters, designed the piles, and evaluated pile drivability. The company used gINT to interpret soil data, define soil profile and design parameters, estimate pile penetration into the soil, and localize boreholes performed on site. The reassessment of pile design saved the cost of 344 steel piles and one year in delivery time.





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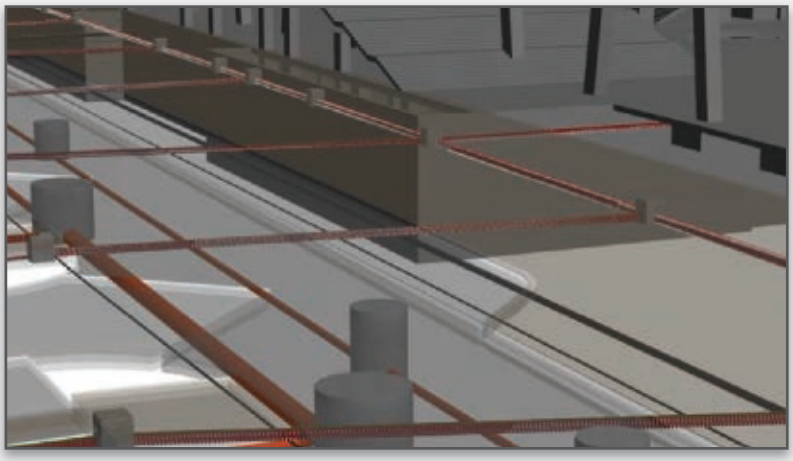




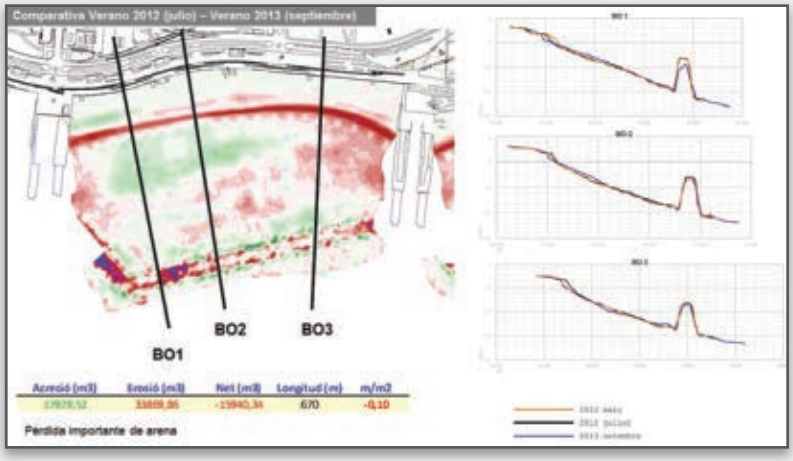
FINALIST

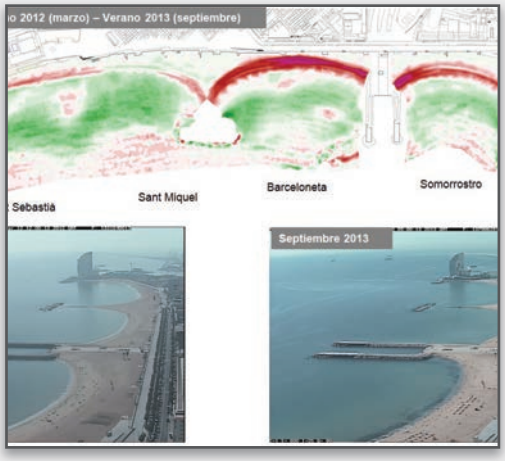
Arup | Doha, Qatar

Civil BIM Implementation for Campus Projects

To modernize its project delivery, Arup sought to implement a BIM methodology that was not typically used for transportation-related infrastructure projects. Starting with USD 30 million in campus projects in Doha, Qatar, Arup integrated all engineering disciplines, using BIM processes to achieve cost and time reductions while improving quality and information accessibility.

Arup Madrid uses Bentley software to design 90 percent of its installations: AECOsim Building Designer for structures, buildings, and utilities; InRoads for road design; and SewerCAD and WaterCAD for water networks. The rollout of the first projects in the Middle East where the company has employed its new civil BIM technology strategy has already produced a 30 percent cost savings. Information quality and accessibility also have improved.





FINALIST

Barcelona Regional S.A. | Barcelona, Spain

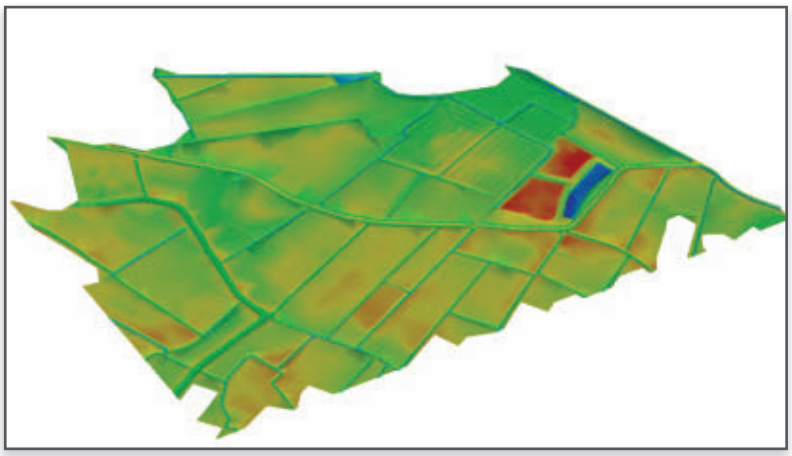
Sediment Balance of the Beaches of Barcelona

The beaches of Barcelona, along with the modernist architecture of Antoni Gaudi, are one of the city's main tourist attractions. The goal of this EUR 100,000 project was to analyze the sand balance on the beaches to determine how many cubic meters of sand are lost or gained every year so the municipality of Barcelona can better protect its beaches from environmental erosion.

Using MicroStation, Barcelona Regional engineers standardized on one format, allowing engineers to work with different programs but within the same environment. The bathymetric information was input into InRoads to create digital terrain models, which enabled engineers to quantify sand change during the study. InRoads provided isopach analysis of surfaces and then allowed the users to easily visualize the differences in color-coded representations.

Innovation in Land Development

De Zuidlanden | Leeuwarden, Netherlands
Wiarda

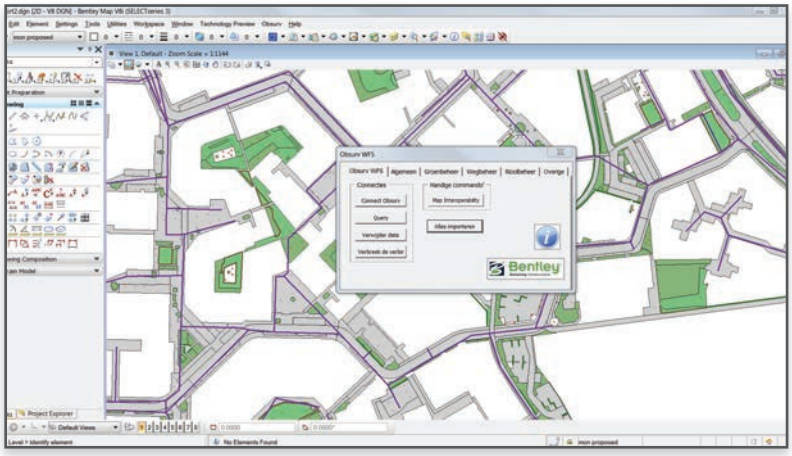


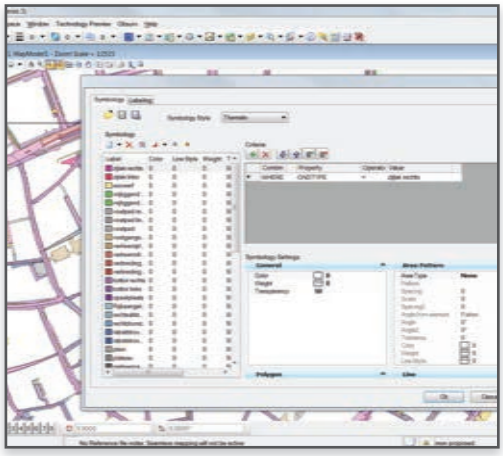


A small neighborhood of 300 homes located in a wetland, the Wiarda project in Leeuwarden, Netherlands, is unique because it embodies typical characteristics of Frisian villages, which feature open landscapes with numerous ponds and strictly adhere to sustainable living. The challenge of this EUR 1 million project was to reshape and preload the wetland terrain and get the soil settings of the load to build the roads and houses.

To quickly and easily calculate the earthwork, create the new water area, build the plots, and determine the soil settings, De Zuidlanden used PowerCivil for Benelux to create the 3D model to be handed over to the contractor for machine control. By working in 3D and automatically generating cross sections, the company reduced its work time on this project by 20 percent.

Gemeente Bergen op Zoom | Bergen op Zoom, Netherlands
Use of Public Space Management Data





In the Netherlands, asset management systems handle public-space data – like green space, sewer systems, roads, and playgrounds – for each municipality. Unfortunately, the latest version of these systems has a Google Maps interface but no GIS capability, so it enables the management of public-space data but is unable to create maps or perform GIS analyses.

This project's goal was to implement information modeling with an information mobility focus. Using Bentley Map, the Open Geospatial Consortium Web Feature Service (WFS) Interface Standard, and i-models, the municipality of Bergen op Zoom now can import public-space data, create thematic maps, and perform GIS analysis. Data is stored in Oracle Spatial and published as WFS, which is used in Bentley Map. Using i-models also makes the data available in Excel and PDF (with the attributes).



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Susquehanna Civil Inc. | Pennsylvania, United States

Test Borings Logging Innovation Using Bentley's gINT





Pennsylvania-based Susquehanna Civil wanted to eliminate the hand-written paper boring logs received from the field that then had to be entered into gINT. Previously, field inspectors faxed logs to the office, where the information was entered into log forms, reviewed, and updated. By improving workflow efficiency and the quality of the boring logs themselves, the company can pass along the savings to its public-sector clients.

Logs are now generated directly from gINT on Windows-based tablets in the field and emailed to the office to be reviewed in almost real-time. Any obvious errors or omissions are communicated back to the field inspectors to be addressed before they leave the job site. As a subconsultant to other design firms, the company can also share information with clients and project owners in an easily readable, professional format in a matter of minutes.









“Arup has already produced the first projects using the civil BIM strategy, saving 30 percent of costs.“

– Oscar Julián, BIM Manager Infrastructure Department, Arup



Innovation in Megaprojects

The projects in this category demonstrate excellence on very large projects. They focus on how project teams overcome the challenges of establishing collaborative workflows among multiple contractors in different locations, while demonstrating a clear return on investment, often in the form of shortened project schedules. The summaries explain how risks were mitigated to avoid overruns and how the use of technology has advanced work processes to benefit all stakeholders.

Innovation in Megaprojects

WINNER

Jacobs and Bouygues Civil Works Florida | Miami, Florida, United States

Port of Miami Tunnel and Access Improvements

For over 20 years, the Florida Department of Transportation studied the feasibility of a tunnel connecting Miami's highway system directly to Port of Miami, one of the busiest cruise and cargo ports in the United States. Finally, advances in tunneling technology and the joint effort of experienced engineers from the United States and Europe proved to be the key success drivers on this USD 1.2 billion project to plan, design, and construct the Port Miami Tunnel.

The project teams from Jacobs and Bouygues Civil Works Florida used ProjectWise to exchange information not only among the design teams that participated on this project, but also among the construction teams–enabling work sharing, content reuse, and real-time feedback. MicroStation, Power GEOPAK, LEAP, and STAAD were also deployed on this megaproject. Together they delivered a high return on innovation and allowed the user to produce the most cost-efficient solution and avoid unnecessary and costly redesigns.





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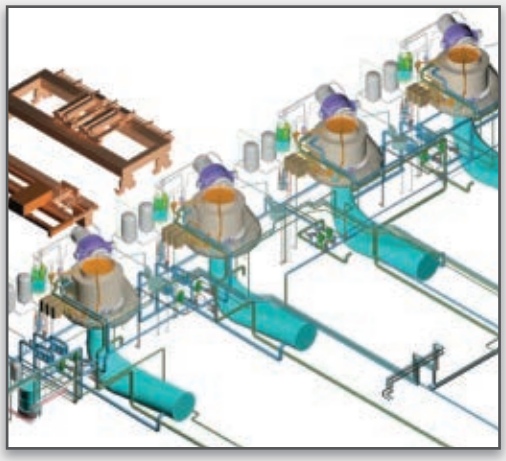


FINALIST

Guangdong Hydropower Planning & Design Institute | Qingyuan, Guangdong, China

3D Design for Qingyuan Pumped Storage Power Station – Detailed Design and Construction

The Guangdong Qingyuan Pumped Storage Power Station in Qingyuan City was constructed for China Southern Power Grid by the Guangdong Hydropower Planning & Design Institute. The power station represented an investment of USD 0.8 billion and has an installed capacity of 1,280 megawatts. It consists of four vertical, single-stage, reversible, mixed-flow pump turbines – with single unit capacity of 320 megawatts – in underground factories.

Using Bentley software, the sophisticated 3D design of the power station facilities created an information model across all disciplines. The information model was delivered to the owner in the i-model data format and is being used in implementation and maintenance. Substantial advantages included a one-month shortened schedule, a 90 percent reduction in errors, and a 60 percent reduction in labor costs.





FINALIST

QGC Pty Limited | Gladstone, Queensland, Australia

The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project

QGC has developed the world's first facility that converts coal seam gas into liquefied natural gas (LNG). This AUD 20.4 billion undertaking is one of Australia's largest capital infrastructure projects. Its goal is to provide a sustainable solution to the ever-rising world demand for cleaner, more efficient energy. The two liquefaction units at the plant will produce a combined 8.5 million tons per year of LNG for Asia-Pacific customers.

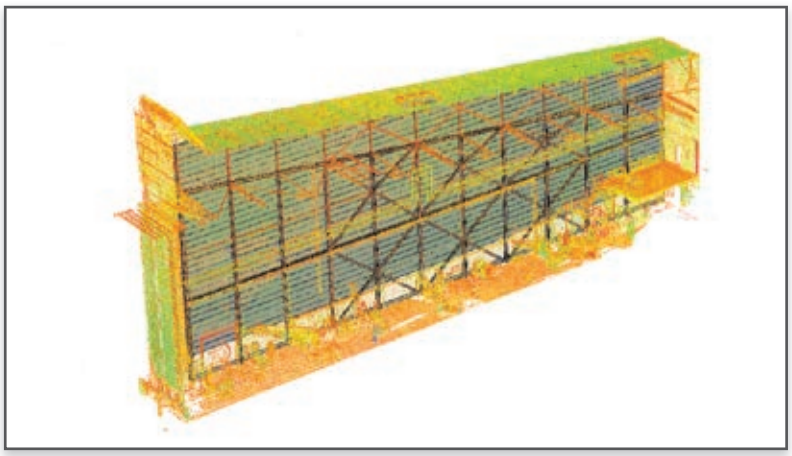
In addition to employing contractors using design tools from multiple vendors, QGC also needed to track 700,000 pieces of equipment from 2,000 wells, 22 plant facilities, four water treatment plants, pipelines, and the Curtis Island liquefaction terminal. Working with Bentley engineers, QGC developed an engineering data warehouse leveraging eB Information Manager. QGC can now convert design data into a common i-model format, which improved collaboration and traceability of changes across the project.

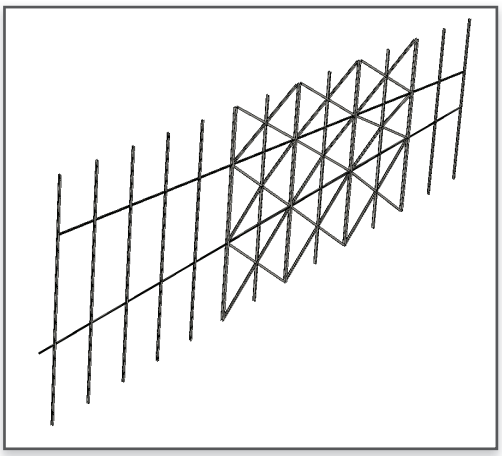
Special Recognition Award Winner Advancing Asset Lifecycle Information Management

Innovation in Megaprojects

Caadplan GmbH | Hamburg, Germany

Survey of an Airplane Construction Hangar in 3D



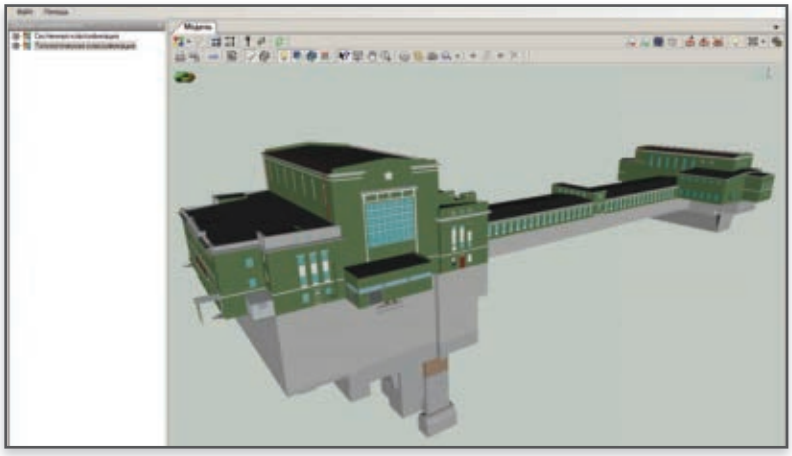


The goal of this EUR 30,000 project for Airbus Operations by Caadplan was to survey an airplane hangar in Hamburg, Germany, using 3D laser scanning to produce data that then would be transmitted to other departments for collision detection and further processing. A requirement of the project was that it needed to be completed without disrupting or impeding construction of the hangar.

The use of MicroStation and Bentley Architecture enabled smooth 3D data interchange among all project participants, and the precise 3D modeling identified collisions and obstacles early in the planning phase. Caadplan reduced the overall cost of the project and minimized or avoided risk by deploying multidisciplinary software that produced a variety of data formats that could be shared among the project participants.

Mayak PO FSUE | Ozyorsk, Chelyabinsk Region, Russia

Information System for Decommissioning Industrial Uranium-graphite Reactors





Operators of Russian nuclear power plants have adopted the concept of decommissioning based on the deferred dismantling of radioactive structures. Given the potential duration, complexity, and risk inherent in the decommissioning process, regulatory and technical guidance documents stipulate the creation of an information system database and the construction of a 3D simulation model of the decommissioning of industrial uranium-graphite reactors.

For this project in the Chelyabinsk Region of Russia, Mayak developed 3D models using MicroStation and created the decommissioning database information system through ProjectWise. This enabled centralized access to a unified database that will preserve and transmit documents and data on the radiation-hazardous facility to those who will handle the dismantling as well as the management of the radioactive waste.



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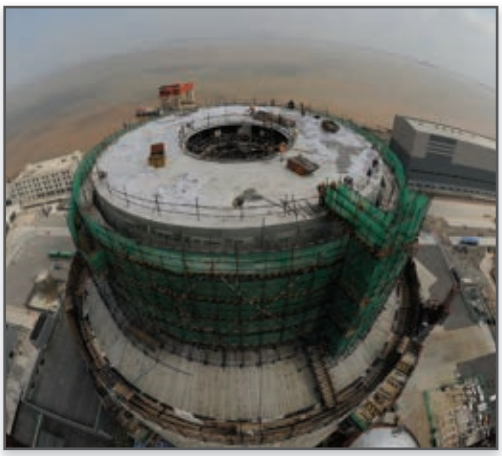
State Nuclear Power Engineering Company | Sanmen, Zhejiang, China

Sanmen Nuclear Power Plant Project Stage I



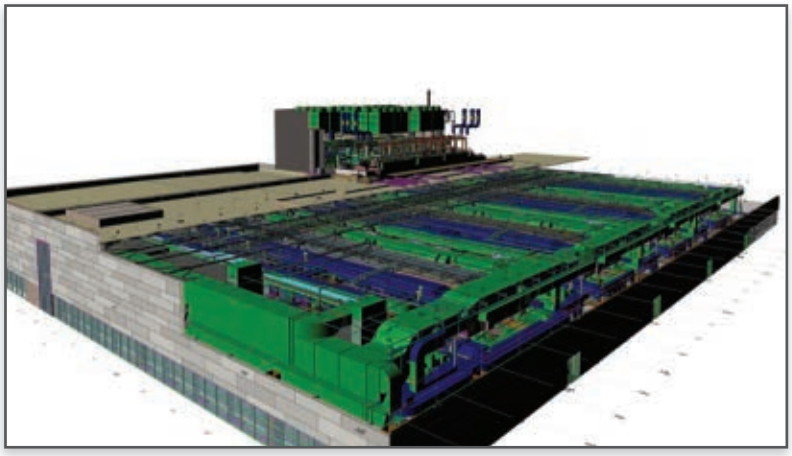


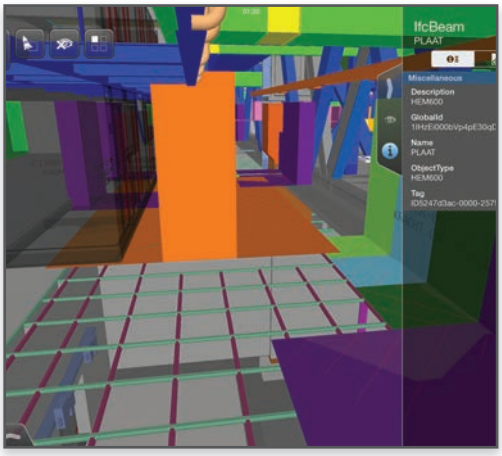
With a total investment of CNY 100 billion, the Sanmen Nuclear Power Plant will be the first third-generation nuclear power technology AP1000 reactor power plant in the world as well as the largest energy cooperation project between China and the United States. Contracted by China National Nuclear Corporation, State Nuclear Power Engineering is constructing six sets of 1.25-gigawatt nuclear power units with a total installed capacity of 7.5 gigawatts.

Using eB Information Manager, the EPC built an engineering data center, which collects and manages the engineering data stored in the document management, engineering design management, process control, expense control, procurement management, commissioning handover, and other business systems during the project construction. It delivers unified, accurate, and reliable information to each specialized sector.

Tekenburo Kembang Kasturi | Veldhoven, Noord Brabant, Netherlands

New Expanded-capacity High-tech Manufacturing Building





The goal of this EUR 150 million project in Veldhoven, Netherlands, was to design three high-tech manufacturing facilities with a total construction weight of five times the weight of the Eiffel Tower in only nine months. The complex construction project encompassed five central heating boilers, eight cooling system units, 16 cooling towers, and 41 HVAC units.

MicroStation and Bentley Navigator were chosen as the standard platform due to their advanced clash-detection and resolution capabilities. Also, information mobility was critical to the project as technical information was added and walk-throughs were analyzed using i-models and iPads. Since MicroStation and Bentley Navigator can read many different file formats, savings on data conversion time were significant.

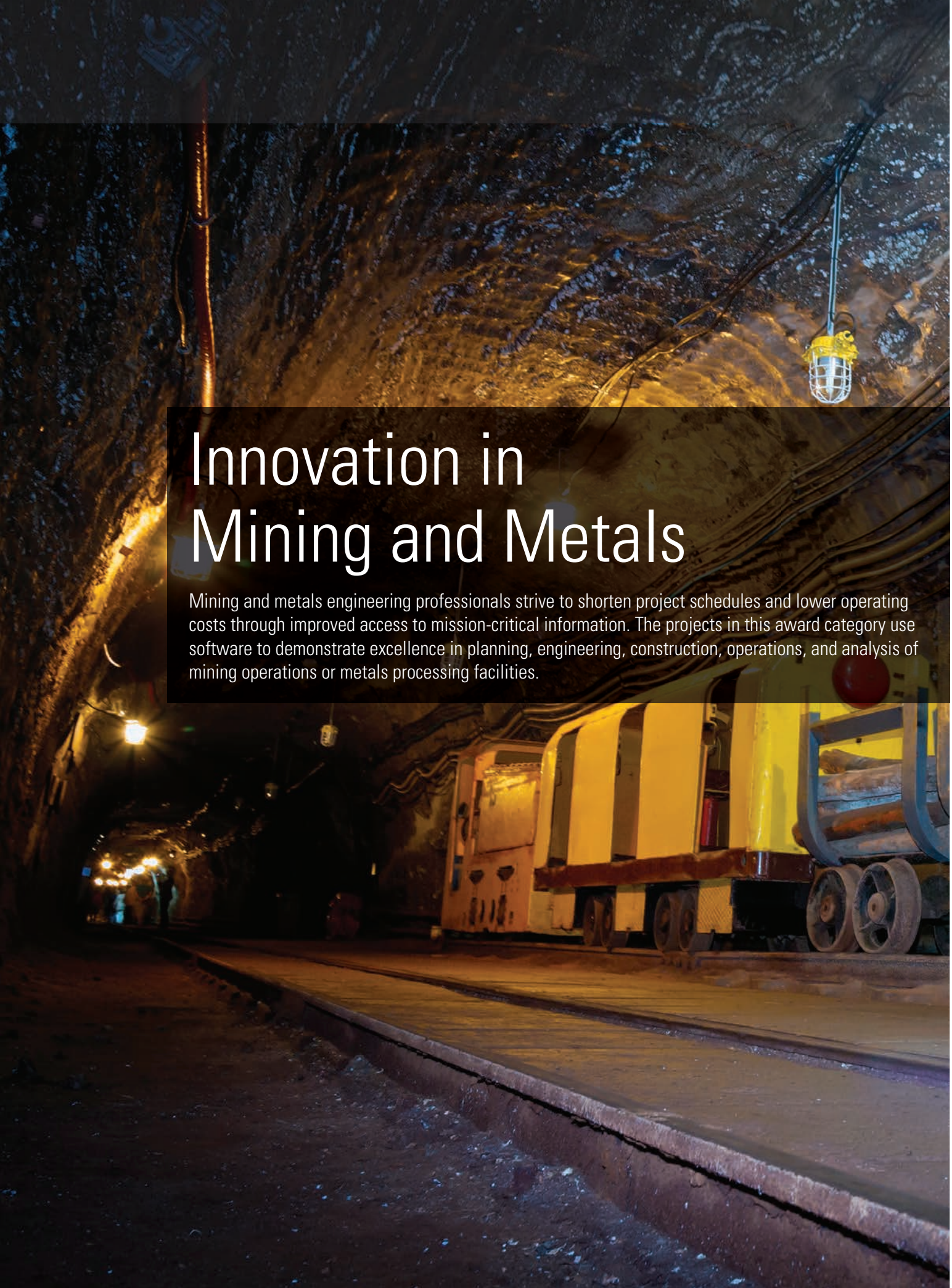






"By utilizing the Bentley MicroStation and ProStructures tools and features, we were able to breathe new life into the heart of our operation while providing certainty to our organization that 3D modeling and design is cost effective, efficient, and safe."

– Frank DeRose, Senior Structural Designer and Drafting Technician, Vale Manitoba Operations



Innovation in Mining and Metals

Mining and metals engineering professionals strive to shorten project schedules and lower operating costs through improved access to mission-critical information. The projects in this award category use software to demonstrate excellence in planning, engineering, construction, operations, and analysis of mining operations or metals processing facilities.

Innovation in Mining and Metals

WINNER

Ausenco | Chamaca and Livitaca, Chumbivilcas, Peru

Constancia Project

Hudbay Peru SAC engaged Ausenco to provide engineering, procurement, construction, and management services for the USD 1.75 billion Constancia Project. Working 4,100 meters above sea level in the Andes, the team managed data across people, disciplines, languages, and multiple locations. Collaboration among Brisbane, Toronto, and Peru to align existing systems, expertise, and processes was critical to the successful delivery of the project.

Using ProjectWise with AutoPLANT, Ausenco brought these disparate engineering teams together, reducing errors and increasing the data integrity throughout the lifecycle of the project. Ausenco implemented more efficient work processes not only on the Constancia Project, but also for all subsequent projects. ProjectWise enabled the tracking of changes on drawings as well as the linking to other systems such as Oracle and Prism, enabling Ausenco to easily obtain the documents for regulatory and compliance requirements.





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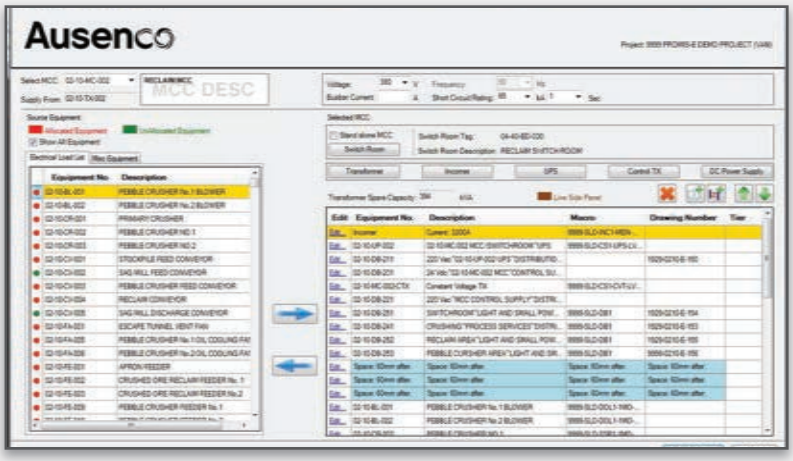
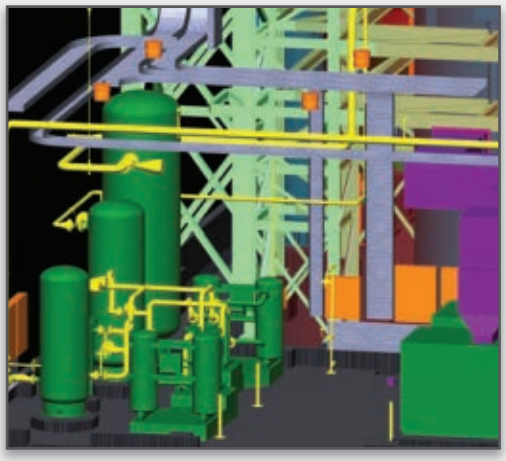




FINALIST

Ausenco | Eureka County, Nevada, United States

Goldstrike

Ausenco's APAC/Africa regional team saw an opportunity to use an integrated approach to automate processes and significantly reduce engineering hours that could be applied to any project. The team proved this approach on Barrick Gold Corporation's Goldstrike complex, located about 60 kilometers northwest of Elko, Nevada. Barrick contracted Ausenco to integrate engineering and design drafting processes, gain efficiencies in work processes, standardize on one integrated platform, and eliminate as many manual processes as possible.

Ausenco utilized its customized integrated electrical engineering and design drafting system to automatically produce single-line diagrams, schematics, terminations, instrument loop diagrams, cable schedules, and data reports. A programmable API placed on the front end of promis•e enabled Ausenco to develop a plug-in extension tool that automated project setup and leveraged ProjectWise's centralized project database.





FINALIST

Vale Manitoba Operations | Thompson, Manitoba, Canada

T1 Mine, 4160 Level Loading Pocket Redesign and Rebuild

Brazil-based Vale, one of the largest mining companies in the world, produces 99.99 percent pure plating grade nickel at its Thompson, Manitoba, Canada, mining facility. The goal of this CAN $4.57 million project was to redesign and rebuild the loading pocket – located 4,160 feet underground – without affecting nickel production. Vale used MicroStation, Bentley Navigator, ProSteel, ProStructures, STAAD.Pro, and Structural Modeler from design through fabrication to construction.

This mine typically experiences six days of downtime every year at a cost of CAN $1 million per day in lost production (not including scheduled maintenance shutdown periods), with the frequency of downtime increasing as the infrastructure ages. With the new upgrade and total redesign, the total project ROI was calculated at less than one year.

Innovation in Mining and Metals

China ENFI Engineering Corporation | Fangchenggang, Qisha Peninsula, China
400,000 TPA Copper Smelting Project

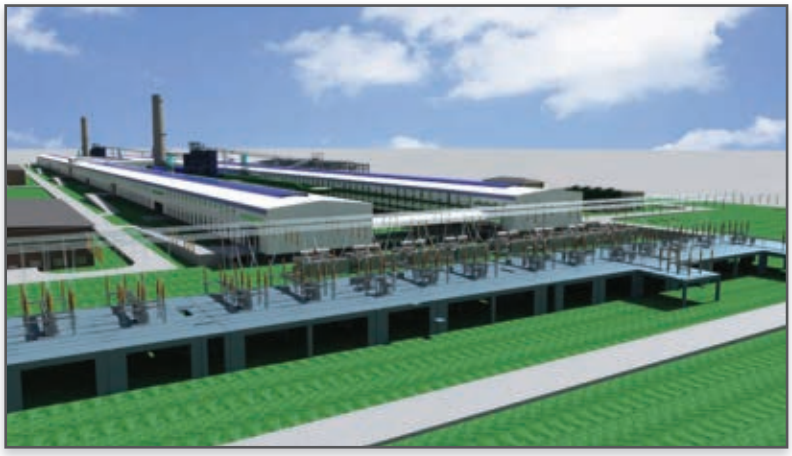


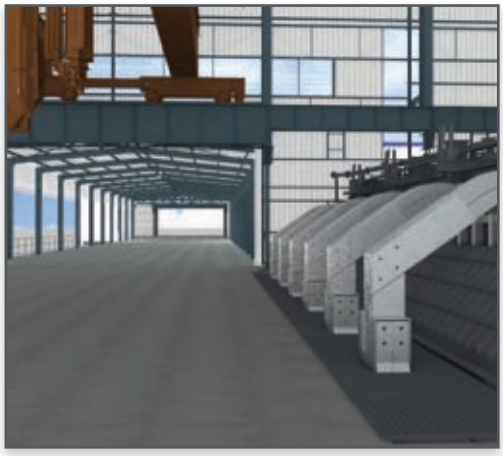


Located in Fangchenggang, a harbor city at the southernmost tip of the Qisha Peninsula in Guangxi province, the Jinchuan Group's 400,000 ton-per-annum Copper Smelting Project is part of the Guangxi Jinchuan Non-Ferrous Metals Processing Program. The CNY 12.43 billion project began in 2009, and the product line went into production in late 2013, becoming one of the largest comprehensive copper smelting programs in China.

The project leveraged Bentley's 3D design solutions, which provided unprecedented accuracy and precision. The clash detection capability alone revealed thousands of problems that would have gone undiscovered in 2D. Other benefits included simultaneous collaborative design, real-time synchronization among disciplines, speedy review and approval, and unified design standards and specifications. MicroStation, ProjectWise, and Bentley OpenPlant helped to decrease design time from 24 months (using 2D) to 18 months (using 3D).

Guiyang Aluminum Magnesium Design & Research Institute | Xiyi, Heqing, Yunnan, China
Heqing Phase-I Project





Yunnan Aluminum Co. Ltd. is building a CNY 2.43 billion aluminum metallurgy and processing operation in Heqing County, Yunnan Province, China. The Heqing Phase-I Project involves construction of a continuous casting and rolling workshop, plate and strip workshops, laboratory, mechanical repair workshop, boxing workshop, substation and transmission line, water treatment circulating system, air compression system, office building, dormitory, and other facilities.

Guiyang Aluminum Magnesium Design & Research Institute performed collaborative 3D design on the Bentley platform, which enabled models to be shared by all disciplines. ProjectWise, MicroStation, PlantSpace, Bentley Raceway and Cable Management, Bentley Substation, ProSteel, Bentley Navigator, Bentley i-models and other products enabled designers to assemble a complete plant model and substantially eliminate collisions and omissions. This minimized construction changes and lowered the owner's costs.



>>>> **VIEW PRESENTATIONS** @ *www.bentley.com/projects2014*

Mintrex Pty Ltd | Duketon, Western Australia, Australia
Garden Well Gold Project

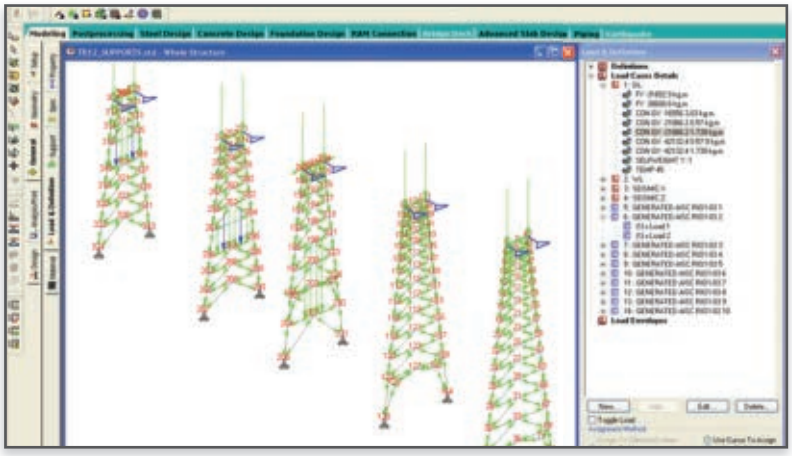


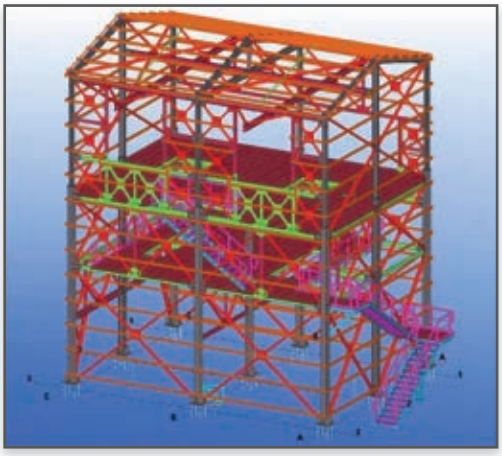


Regis Resources, a Perth-based gold production and exploration company, awarded Mintrex the engineering and procurement contract for the gold processing plant at the AUD 113 million Garden Well Gold Project in Duketon, Western Australia. The plant had twice the capacity of a prior project, but was delivered on a shorter design schedule – just 24 weeks from design to construction.

Mintrex used a zero-based design approach to deliver just what was required. Using Bentley products allowed information to be imported from other companies without expending additional resources. Transferring 3D models from Structural Modeler directly to the shop detailer, who used ProSteel, shortened the lead time to produce shop detailed drawings. Bentley Navigator provided up-to-date i-model review between disciplines and the client, ensuring no unnecessary extras were included in the design.

RM Servicios Integrales de Ingeniería | Saudi Arabia
Transfer Towers and Bulk Transport Belts Design





This USD 20 million project was awarded by the Saudi Arabian Mining Company to RM Servicios Integrales de Ingeneiría to design transfer towers and belt conveyors for bulk minerals. The 240-meter conveyer belt needed to be designed to American standard codes in record time.

The use of STAAD.Pro delivered benefits early in the project. It automated the adherence to required design codes, and its interoperability with other software for plan production saved the company significant time and money. The successful design currently serves as an international industry reference for RM Servicios Integrales de Ingeneiría.







"Setting up ProjectWise for the project enabled Ausenco to utilize the core competency of our strategically located offices to work-share the engineering and design of the project in real time, allowing Ausenco to produce 3D models and associated databases accurately and efficiently."

– Anuj Anand, Lead Design Systems Engineer, Ausenco



Innovation in Offshore Engineering

This award category recognizes projects that have demonstrated excellence in planning, design, analysis, engineering, construction, operations, and/or decommissioning in the marine environment.

Innovation in Offshore Engineering

WINNER

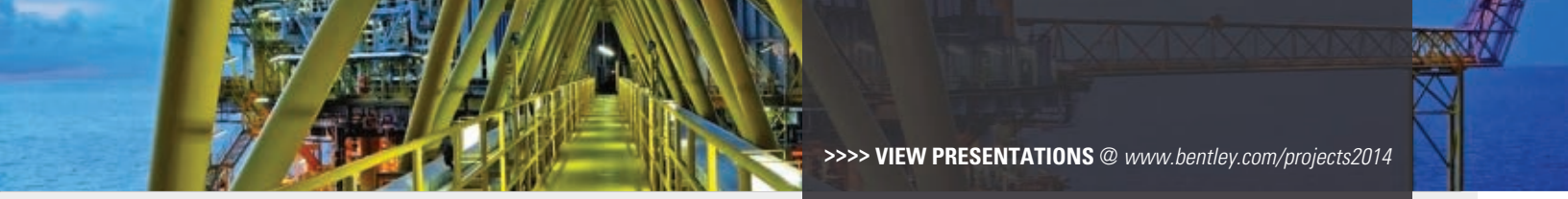
Dockwise Shipping B.V. | Bay of Bengal, Myanmar

SHWE Transportation and Installation

The USD 1.5 billion SHWE gas field development project at the Bay of Bengal, Myanmar, required transportation and installation of a massive 22,000-metric-ton jacket and 30,000-metric-ton topsides with deck support frame. The contract was awarded to Dockwise by EPCI contractor Hyundai Heavy Industries. Dockwise performed the operation and engineering for the jacket transportation, jacket launch, topsides transportation, and topsides float-over.

Dockwise spread the work among its three design centers in the Netherlands, United States, and China. An innovative bottle-shaped barge design to transport these massive structures was produced using MOSES and SACS. Data access, accuracy, traceability, and workflow were addressed by managing files in ProjectWise. These solutions saved about 5,000 of the 30,000 man-hours estimated for execution and reduced the four operational days offshore by half.





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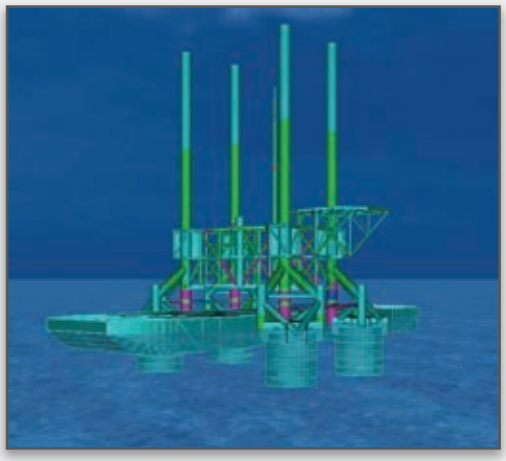


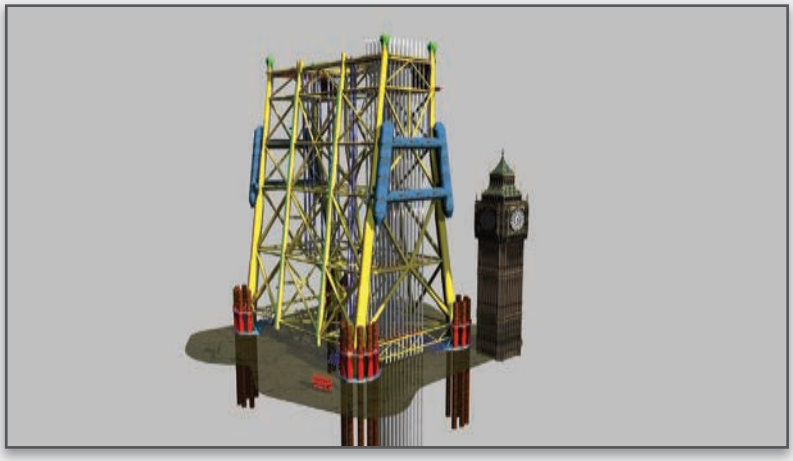
FINALIST

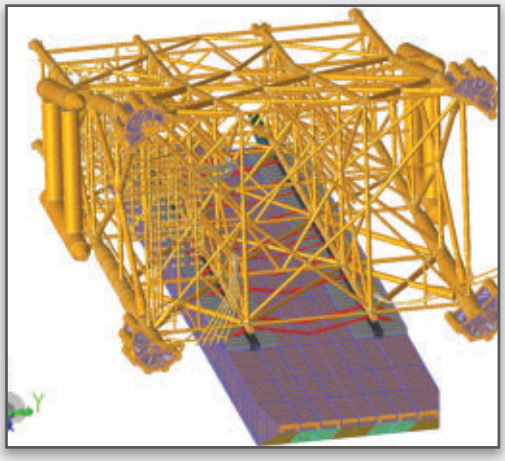
Orca Offshore | Dutch North Sea, Netherlands

Centrica F3-FA Self-installing Platform

Orca Offshore performed transport and installation analyses for Centrica's GBP self-installing gas platform in the Dutch North Sea. The F3-FA platform has a suction pile foundation resting on a temporary barge for transportation. It can be relocated, providing significant cost savings across three to four fields. Orca's scope of work included motion and stability analysis, multi-body dynamic analysis, structural spectral analysis, and scale model tests.

It was crucial to know hydrodynamic loads early in the project due to the pile size – 15 meters high and 15 meters in diameter – and proximity to the wave zone. The loads determined how to size the steel work. MOSES determined those loads and the wave clearances required to confirm the structural strength of the platform. The use of MOSES reduced the amount of steel required in the platform and for sea fastening and proved that this unique, reusable platform concept would work.





FINALIST

SNC-Lavalin UK Limited | Aberdeen, Scotland, United Kingdom

Mariner Jacket Detailed Design

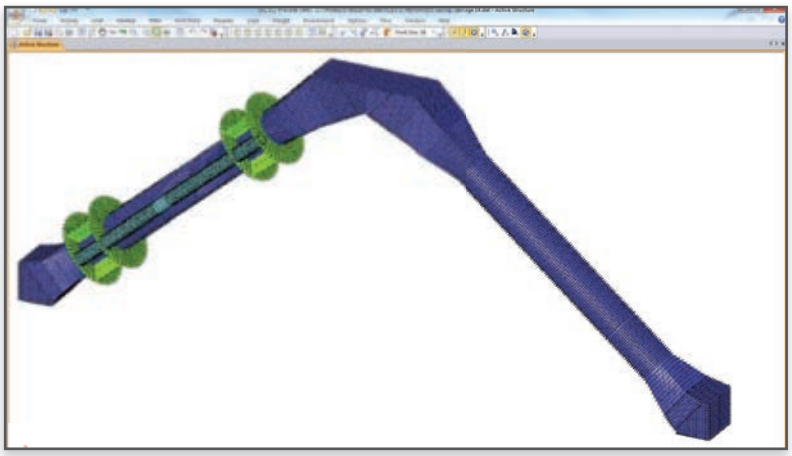
Statoil awarded SNC-Lavalin the front-end engineering design contract for its massive 22,000-ton jacket at the USD 7 billion Mariner oil field development in the U.K. sector of the North Sea. With an 88-by-62 meter footprint on the seabed, the 120-meter-high jacket supports a topside facility weighing approximately 54,000 tons. The jacket's weight and subsequent installation by barge were significant challenges.

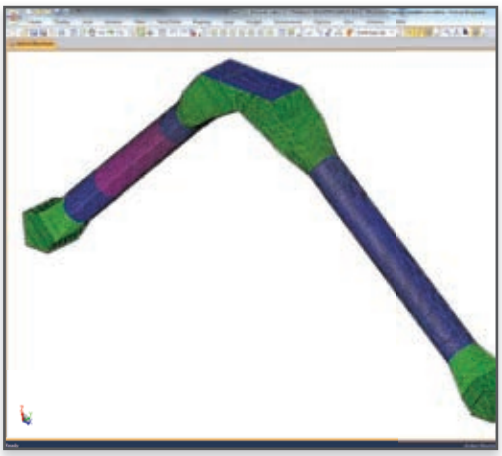
Using SACS and STAAD.Pro, SNC-Lavalin completed the jacket design in a tight timeframe. Nineteen interrelated analyses were performed effectively using SACS' various modules, including wave-loading under storm conditions, seismic response, fatigue, sea-transportation, and accidental impact. STAAD.Pro was used for the detailed design of secondary steel. Working with the same software as the topsides designer enabled efficient information sharing and modeling of the interfaces between jacket and topsides.

Innovation in Offshore Engineering

Diplamar Servicios de Ingeniería S.A. de C.V. | Ciudad del Carmen, Campeche, Mexico

Reinforcement of a Semi-submersible Platform



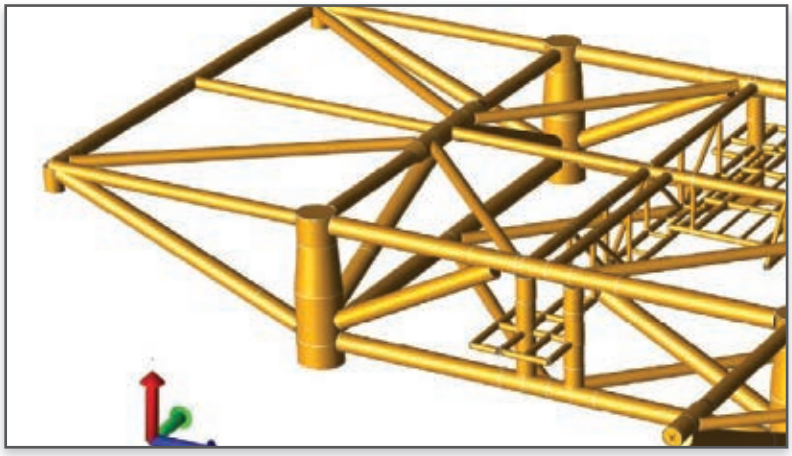


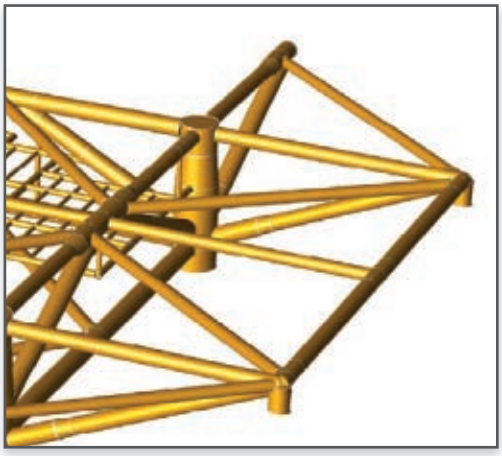
For this USD 150,000 project, the scope was to determine the temporary reinforcement needed for the aft port of a damaged semi-submersible platform in order to maintain the vessel's certification and keep it operating prior to being brought back to the shipyard for permanent repairs. The team had two to three weeks to prove the temporary fix was viable and selected SACS even though SACS is not normally used for this type of floating structure.

Diplamar used SACS to quickly develop models to assess the current condition of the damaged element, then determine the structural behavior of the bracing before and after the damage. A support structure was designed, and the behavior of the reinforced bracing was verified. This enabled the vessel to remain certified and complete its program before being returned to the shipyard for maintenance.

Engineers India Limited | Gujarat, India

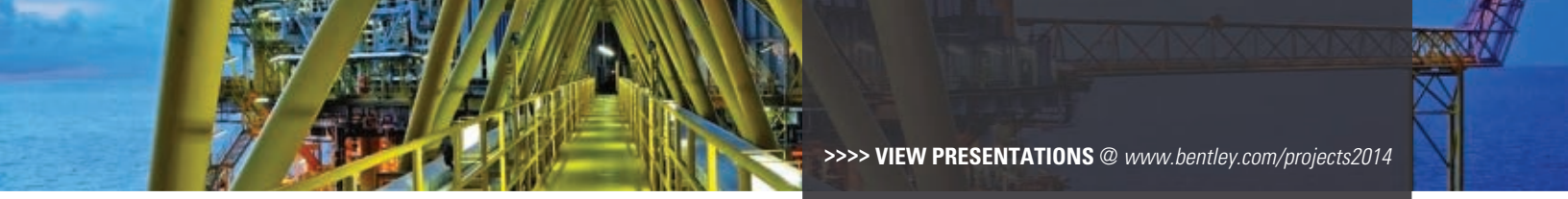
Deck Supporting Frame to Facilitate Installation of Four-legged 6500 MT Process Deck





Located off the east coast of India, the process-cum-living quarter platform project for Gujarat State Petroleum Corporation Ltd. involved design and analysis of a deck supporting frame (DSF) to facilitate installation of a four-legged process deck. The platform's three levels included modules for the turbine generator, living quarters, and gas dehydration unit.

Weighing 6,500 metric tons, the deck could not be lifted by the available offshore barge crane. Engineers India Limited split the deck into two parts and introduced the DSF for support. Using SACS to finalize the DSF configuration and design optimization helped to finish the task within the three-to-four month schedule. Bentley software was used for design and analysis of the in-place condition, pre-service condition, installation sequencing, and stability at every stage of the installation.



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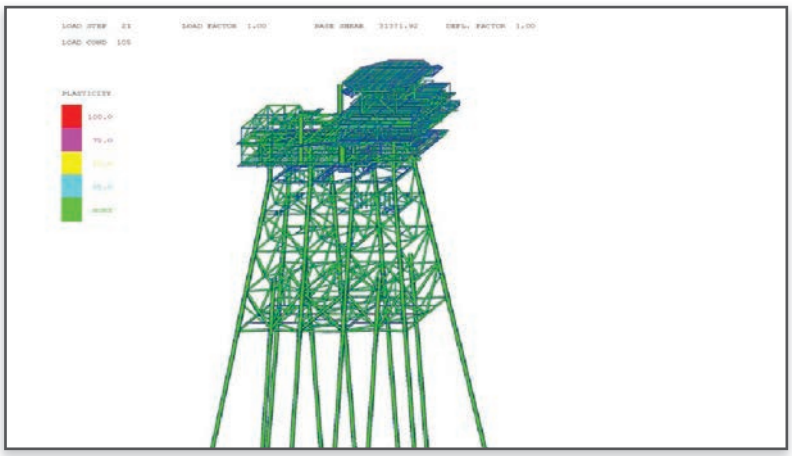
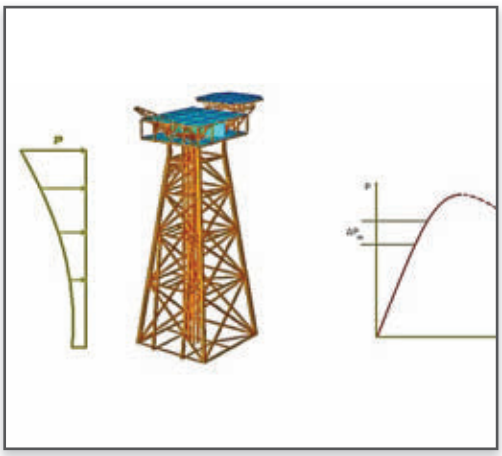
Engineers India Limited | Delhi, India

Requalification Study of 50 Existing Offshore Platforms





Oil and Natural Gas Corporation Limited (ONGC) was required to requalify 50 offshore platforms off the west coast of India to ensure they are fit for purpose and able to operate past the 25-year design life. Engineers India Limited had two years to complete the process, which involved assessing structural strength in light of any modifications, additional loads, and underwater dents or damages.

SACS was used to model each platform and perform in-place analysis, pushover analysis, fatigue analysis, and linear elastic analysis. The SACS collapse module accurately assessed the reserve strength ratio, including member plasticity and plastic hinge formation for each load factor. The rapid analysis enabled Engineers India to complete the project on schedule and meet ONGC's goal of continuing platform operations without losing production.

Felci Yacht Design | Padenghe sul Garda, Italy

Dufour 500 Grand Large





The Dufour 500 Grand Large is a flagship yacht designed by Felci Yacht Design for Dufour Yacht, builder and distributor of sailing yachts throughout the world. An innovative concept drove design of the 500, which features a raised saloon deck house. The slight elevation provided the advantages of light and large interiors, while keeping the style and aesthetic typical of Dufour yachts.

MAXSURF provided software tools for all phases of the vessel design and analysis process. Fast and homogeneous information exchange allowed the design team to analyze numerous solutions while respecting the project budget and schedule. Simulations and photorealistic renderings enabled Dufour Yacht to visualize what Felci Yacht Design had in mind. With every detail analyzed and optimized, the result was a brand-worthy vessel.

Innovation in Offshore Engineering

Guodian United Power Technology Co., Ltd. | China

Offshore New Energy Utilization Research and Development Project



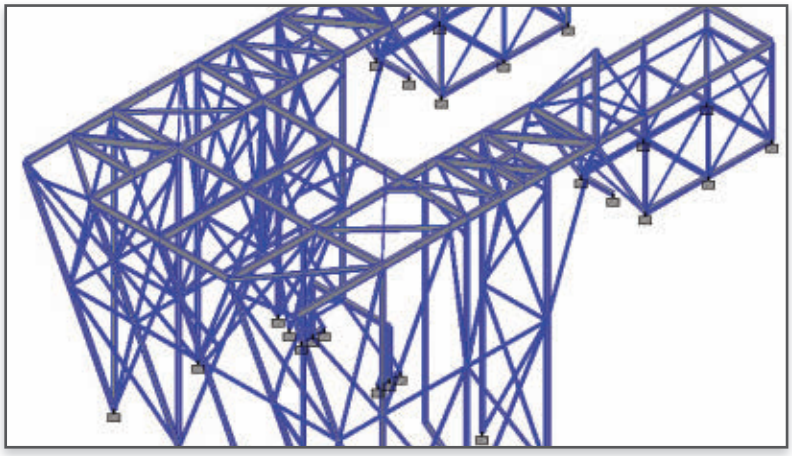


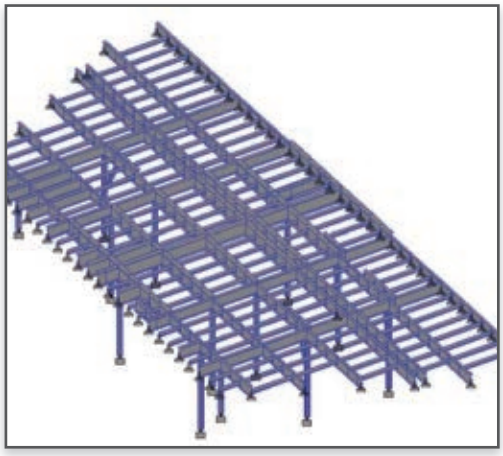
Guodian United Power Technology Co., Ltd. (United Power) launched an offshore energy utilization project to develop tidal current and wind energy. The CNY 5.3 billion Phase 1 includes an experimental prototype tidal current energy project off the coast of Zhoushan, Zhejiang, China, and a wind turbine project offshore of Leting, Hebei, China. Preliminary planned capacity is 300 megawatts, and overall planned capacity is 4,400 megawatts.

Guodian United Power used SACS to design the foundation and support structures. The three-pile jacket-type tidal current set weighed 700 tons. SACS performed modeling, hydrodynamic force calculation, and analysis of working conditions. For the six-pile jacket-type wind turbine set, SACS performed strength analysis, modal analysis, and fatigue analysis. Calculations for 459 fatigue working conditions took only 30 hours, saving labor and material costs.

Harris Pye Engineering | Brazil

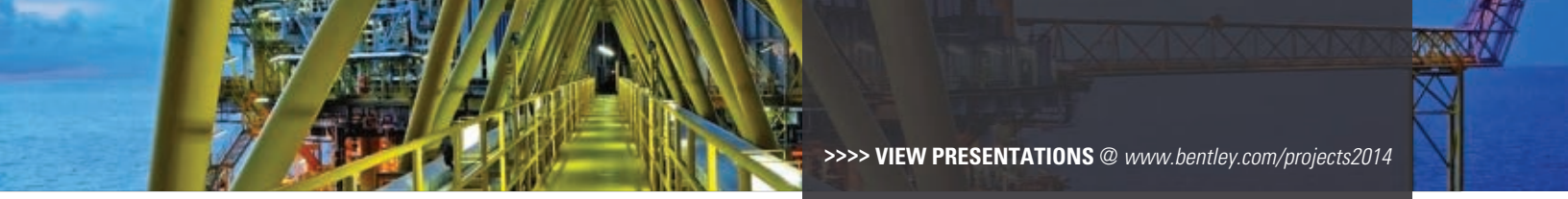
Marlim Sul Helideck Removal and Replacement





An oil tanker collision severely damaged the starboard aft side of the Marlim Sul, a floating production storage and off-loading vessel owned by SBM Offshore. Harris Pye Engineering removed and replaced the helideck while the vessel was in production off the coast of Brazil. The firm designed, fabricated, and installed the new helideck, as well as designed a temporary cradle and bumper for the new pancake supplied by another company.

Harris Pye used a 3D scanner system together with Bentley CloudWorx and Bentley Pointools to quickly gather information needed to perform the work. The main structural design software used was STAAD.Pro. It allowed Harris Pye to quickly model the temporary cradle and the part of the deck where it was installed, reducing time and costs for the USD 5 million project.



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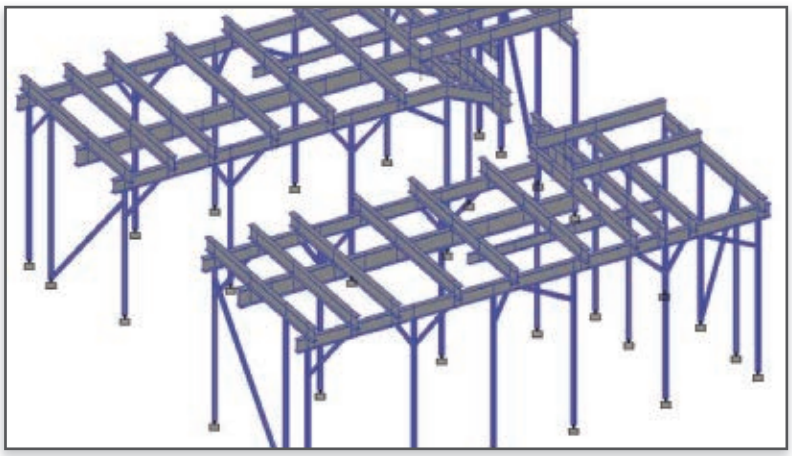
Harris Pye Engineering | Brazil

MV-18 Material Handling Structures





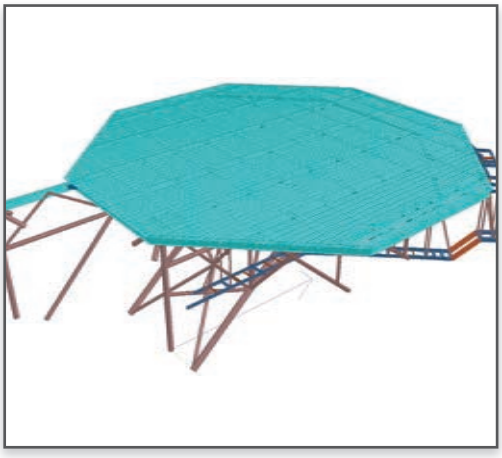
MODEC, an EPC contractor specializing in the installation of floating production systems, retained Harris Pye Engineering for design, fabrication, and installation of two material handling structures on board the Cidade de Niteroi, a floating production storage and off-loading vessel located off the coast of Brazil. The structures replaced six heat exchangers on an elevated module.

This USD 962,160 project involved structural analysis and detailed design of the material handling structures, as well as assessment of the platform for structural adequacy. The structures were prefabricated on shore, then assembled on the vessel. STAAD.Pro allowed Harris Pye to simply and quickly model the structures and platform, reducing the time and cost of the project. Carrying out the installation offshore while the vessel was in production minimized client losses.

Harris Pye Engineering | Palermo, Italy

Ocean Endeavour Helideck Enlargement





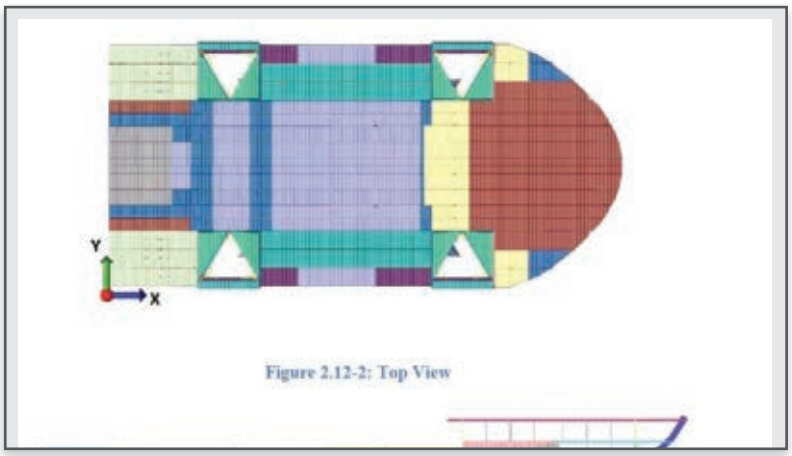
Harris Pye Engineering was contracted by Diamond Offshore to design modifications required to enlarge the existing helideck on the semi-submersible drilling rig Ocean Endeavor. The helideck was originally designed for a Sikorsky S-61N helicopter, and the enlargement accommodates a 25-meter-long Mil Mi-8 helicopter. Use of the latter would reduce the number of flights required to transport people.

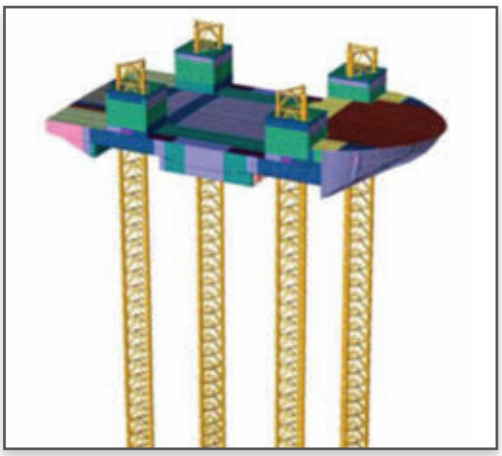
Harris Pye used STAAD to model the helideck, which was designed with different structural software. STAAD allowed Harris Pye to simply and quickly modify the design to meet the new geometrical and structural requirements. The process of class approval was also accelerated, since STAAD's code check of structural members was done in accordance with American Bureau of Shipping rules and guides. These time savings reduced the overall cost of the USD 92,500 project.

Innovation in Offshore Engineering

IRCLASS – Indian Register of Shipping | Mumbai, Maharashtra, India

Mobile Offshore Drilling Unit to Mobile Offshore Production Unit Conversion



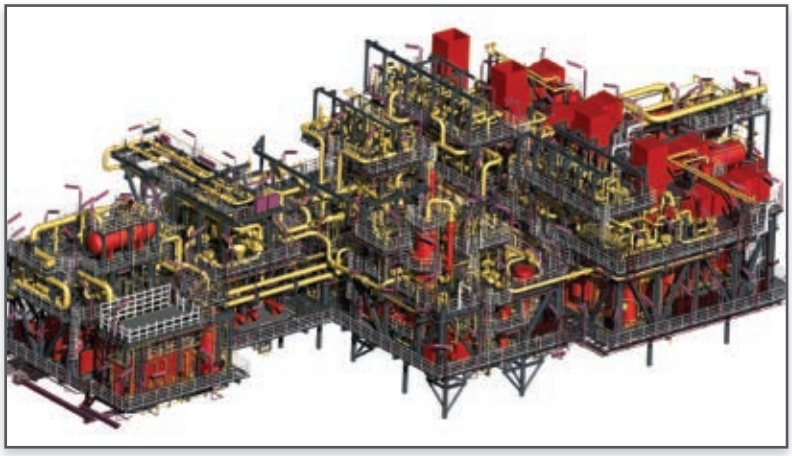


Converting a mobile offshore drilling unit into a mobile offshore production unit (MOPU) costs approximately USD 100 million, or about one-third as much as constructing a new MOPU. This was a cost-effective strategy for development of a field where flow was expected to last about eight years. The Indian Register of Shipping (IRCLASS) was retained to classify and certify the transformation.

IRCLASS used SACS to accurately model and analyze all pre-service and in-service conditions of the MOPU, as well as to verify the analysis report submitted by the client and perform the code check. SACS reduced the man-days required for the review by 50 percent, helping to complete the entire task within four months instead of 10 months. This ultimately reduced the overall project delivery cost.

Kavin Engineering And Services Private Limited | Singapore

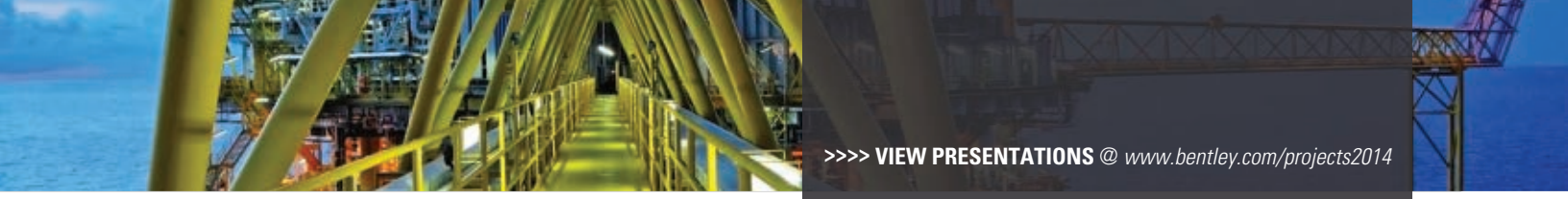
Top Side Engineering – FPU Joko Tole





The Terang Sirasun Batur gas field is located about 100 kilometers north of Bali, Indonesia. As part of field development, BW Offshore retained Kavin Engineering And Services Private Limited to perform detailed design of the process, piping, mechanical, structural, electrical, and instrumentation for the conversion of the floating production unit Joko Tole into a floating production storage and off-loading unit.

The USD 55 million project was constrained by limited space on the tanker. Kavin designed an integrated pipe rack that reduced space usage by 30 percent and weight by 1,000 tons. The integrated structural modeling interface between STAAD.Pro, SACS, and ProSteel reduced modeling man-hours by 30-40 percent. Clash detection and resolution with Bentley Navigator eliminated rework during construction, enabling completion ahead of the six-month schedule and improving profitability by USD 2 million.



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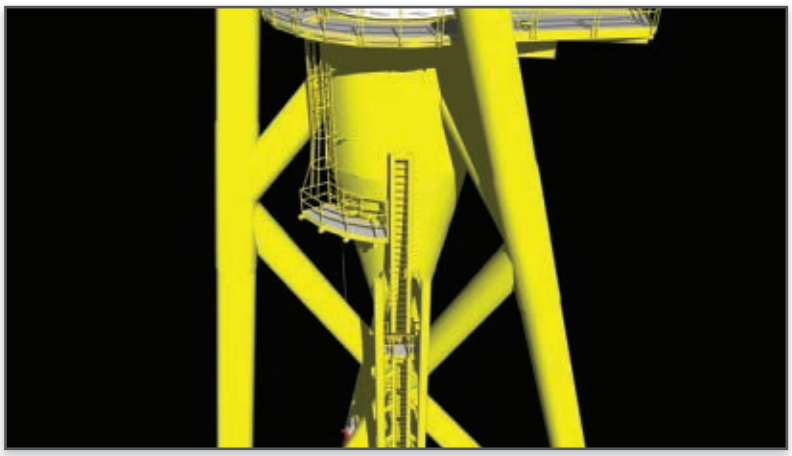
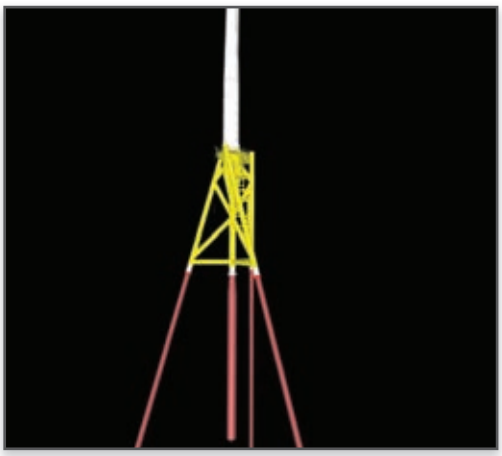
Keystone Engineering Inc. | Virginia, United States

Virginia Offshore Wind Technology Advancement Project



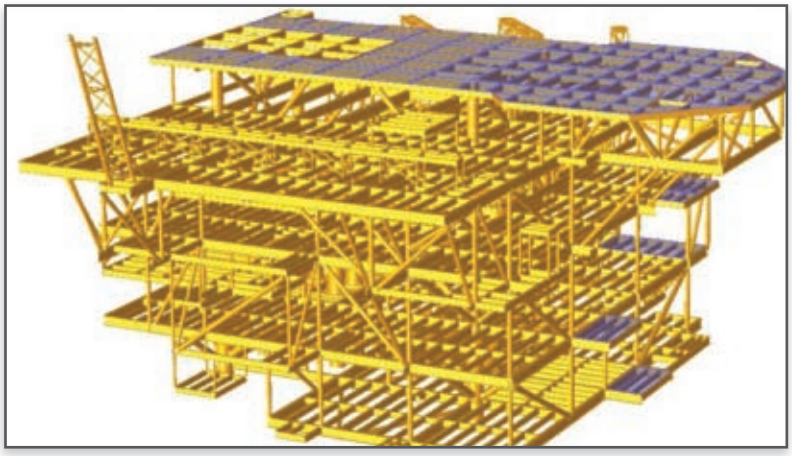


This USD 60 million project involved installation of two offshore wind turbine generators off the Virginia coast. As one of the first wind turbine generator installations in the United States, the project will demonstrate the cost savings associated with innovative foundations and sub-structures. The designers also applied the first fully coupled hydrodynamic and aerodynamic analysis for a commercial offshore wind plant.

The ability to use SACS to post-process data from DNV GL's bladed wind turbine design software allowed Keystone Engineering to use the analyses performed by the wind turbine generator designers (Alstom) to design foundations and support-structures with no rework. Using multiple cores for simulations in the SACS wind turbine module reduced analysis time by more than 50 percent, resulting in fewer man-hours billed to the client.

L&T Hydrocarbon Engineering Ltd | Abu Dhabi, United Arab Emirates

Nasr Phase I Development Project





Abu Dhabi Marine Operating Company is developing the Nasr oil field off the coast of Abu Dhabi, United Arab Emirates, in two phases, with the USD 450 million Nasr Phase 1 Development Project under EPCC contract to Larsen & Toubro Limited (L&T). L&T-Valdel Engineering Limited provided engineering design for the WHT-1 and WHT-2 wellhead platforms, manifold tower (MFT), and bridge between WHT-1 and MFT.

The 2,550 metric ton WHT-2 deck presented an engineering challenge. All pre-service and in-service conditions were modeled and analyzed in SACS, resulting in an economical and workable design. Steel weight for the deck and facilities it accommodated were optimized. SACS also performed the pancake lift analysis to optimize crane usage. On-time delivery of 10 months allowed the owner to initiate installation on schedule, resulting in no downtime due to inclement weather.

Innovation in Offshore Engineering

L&T Hydrocarbon Engineering Ltd | Abu Dhabi, United Arab Emirates

Nasr Phase I Offshore Bridge Engineering



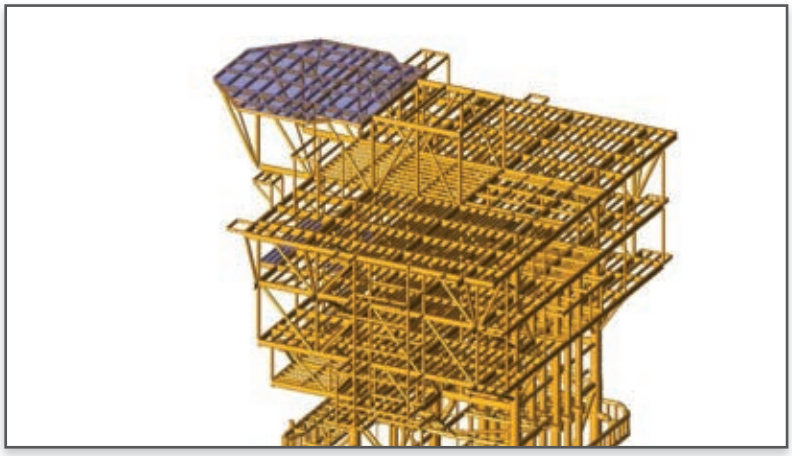


Abu Dhabi Marine Operating Company is developing the Nasr oil field off the coast of Abu Dhabi, United Arab Emirates, in two phases, with the USD 450 million Nasr Phase 1 Development Project under EPCC contract to Larsen & Toubro Limited (L&T). L&T-Valdel Engineering Limited provided engineering design for the WHT-1 and WHT-2 wellhead platforms, manifold tower (MFT), and bridge between WHT-1 and MFT.

L&T-Valdel used SACS for modeling, analysis, and optimization of the 86-meter-long, 500-metric-ton bridge, as well as for design of tertiary steel. The software analyzed the structure – the longest and heaviest of its kind – for all static loads, which were modeled in pre-service and in-service conditions. SACS not only improved design accuracy but also provided visual clarity, which saved construction time and material.

L&T Hydrocarbon Engineering Ltd | Abu Dhabi, United Arab Emirates

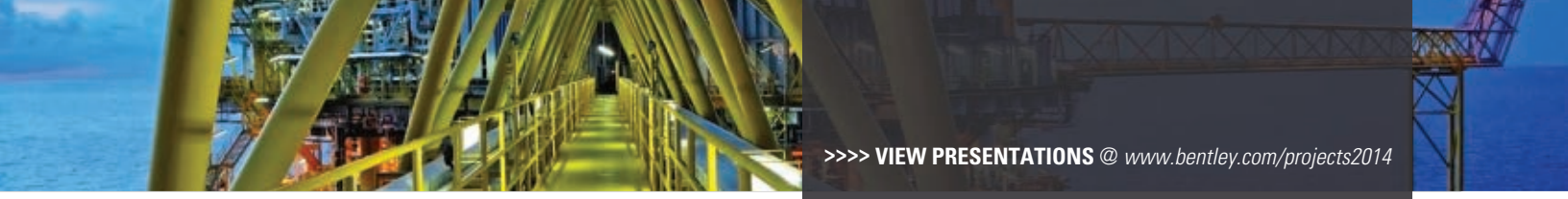
Umm Lulu Phase I Development Project





Umm Lulu is an undeveloped oil field that is part of the Abu Dhabi Marine Operating Company (ADMA OPCO) concession area off the coast of Abu Dhabi, United Arab Emirates. ADMA OPCO is developing the field in two phases and awarded Larsen & Toubro Limited (L&T) the EPCC contract for the USD 450 million Umm Lulu Phase-I Development Project.

Under this contract, L&T-Valdel Engineering Limited provided engineering design for the WHT-4 and WHT-6 wellhead towers. SACS was used for modeling, analysis, and optimization of the jacket and topside structure and to design the tertiary steel. SACS not only improved design accuracy but also provided visual clarity, which saved construction time and material. Steel quantities and material waste were significantly reduced. Topside design was completed on schedule in just 10 months.



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L&T-Valdel Engineering Ltd | Yangon, Yangon , Myanmar
Yetagun Phase V Development Project



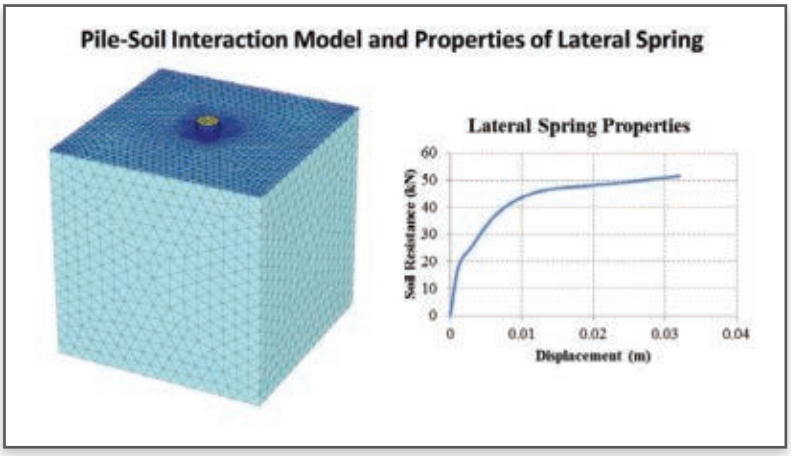
SAIL-OUT OF YETAGUN-D JACKET

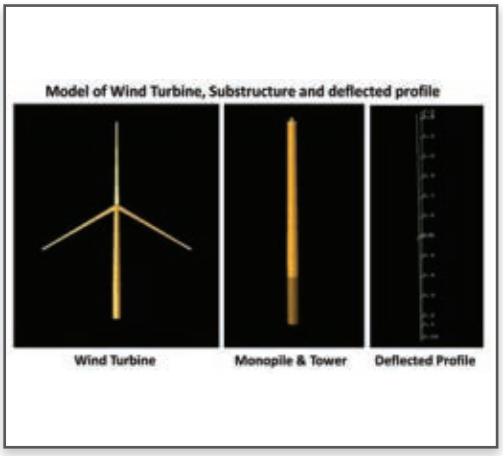


Petronas Carigali Myanmar Ltd retained L&T-Valdel Engineering Ltd to install a four-legged wellhead platform (Yetagun North) as part of the Yetagun Phase V Development Project in the Andaman Sea, Myanmar. The USD 100 million project included installation of an 11-kilometer pipeline from Yetagun North to the Yetagun Main platform, host tie-in works, and modification of the Yetagun-C Main platform to accommodate additional facilities.

Performing the analysis in SACS ensured that the appropriate structural arrangement was selected for the platform without changing the required free issue materials. Engineering activities were completed on time, and material orders proceeded with no impact on project cost. L&T-Valdel's timely delivery of the platform jacket allowed the owner to initiate drilling in the planned weather window with no downtime due to inclement weather.

National Institute of Ocean Technology, Ministry of Earth Sciences | Chennai, Tamil Nadu, India
Feasibility Study for Design of Fixed and Floating Platforms for Offshore Wind Turbine





With severe energy shortages throughout India, the National Institute of Ocean Technology, Ministry of Earth Sciences, has initiated studies to design an economically viable substructure for offshore wind turbines. The installations could exploit 3,100 kilometers of coastline in the southern region (including the states of Tamil Nadu, Andhra Pradesh, Karnataka, and Kerala), where the energy shortage peaked at 7.6 percent during fiscal year 2013-14.

To develop the design, the Institute coupled aerodynamic and hydrodynamic load analysis with investigation of soil structure interaction. SACS reliably tested various load cases and combinations to arrive at the optimal configuration. The software's built-in features provided soil properties at different layers, which were generated using PLAXIS 3D. The model was then used for various scenarios, resulting in reduced computational and design cycle time.

Innovation in Offshore Engineering

Offshore Oil Engineering Co., Ltd. | China
Liwan 3-1 Jacket Design

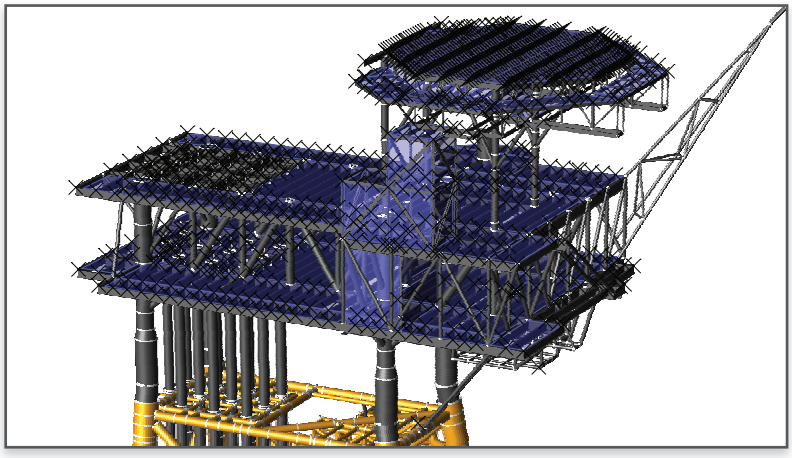


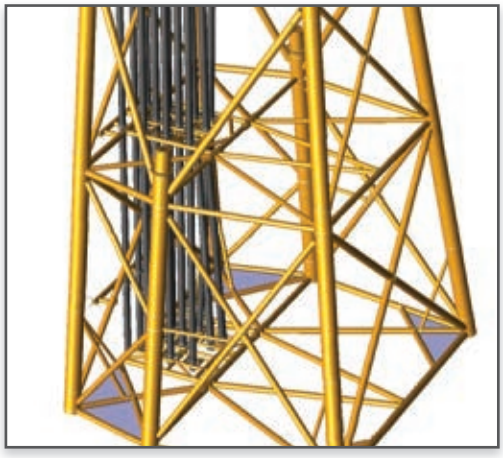


Located in the South China Sea where the average water depth is 1,500 meters, the Liwan 3-1 field is the first deepwater oil and gas field in China. Offshore Oil Engineering Co., Ltd., performed detailed design for the CNY 1.2 billion Liwan 3-1 natural gas center platform and submarine pipeline. For analysis and design, the company replaced manual strength analysis with automated technology based on SACS and MOSES.

The jacket, which was 189.5 meters deep, 201 meters high, and weighed 31,126 tons, was modeled and loaded using SACS, and imported into MOSES for analyzing the launching motion. The final load was imported into the structural model for strength checking. The analysis was completed by one person in less than two days. The technology reduced project delivery time by one month and costs by CNY 10 million.

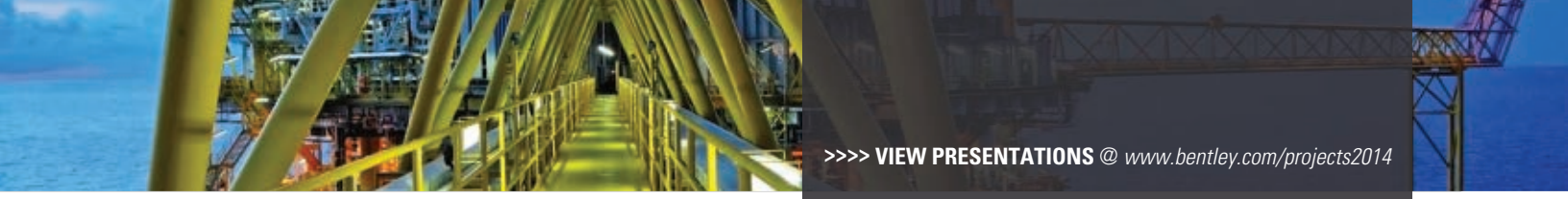
Oil and Natural Gas Company Limited | Mumbai, Maharashtra, India
Structural Integrity Assessment of a Typical Wellhead Platform





The Oil and Natural Gas Company Limited made USD 1 million in modifications to an existing wellhead platform to enhance production from a field located in the Indian offshore region. The company's initial structural integrity assessment revealed stressed members and joints, which required mitigation and strengthening measures before the modifications could be made.

Once the structure was strengthened, additional risers and associated topside facilities were incorporated on the platform. Using SACS to perform the structural integrity analysis saved computation time and effort. This shortened the study phase and allowed the project to be delivered in less time. The software also helped to ensure that the structural jacket platform complied with Oil Industry Safety Directorate regulations.



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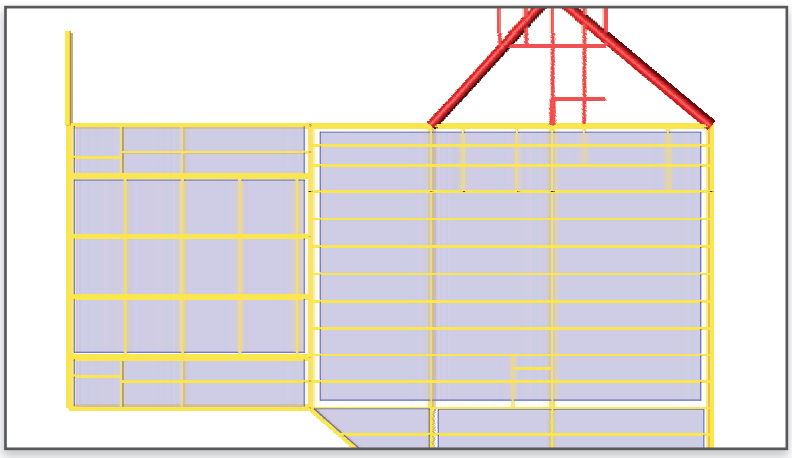
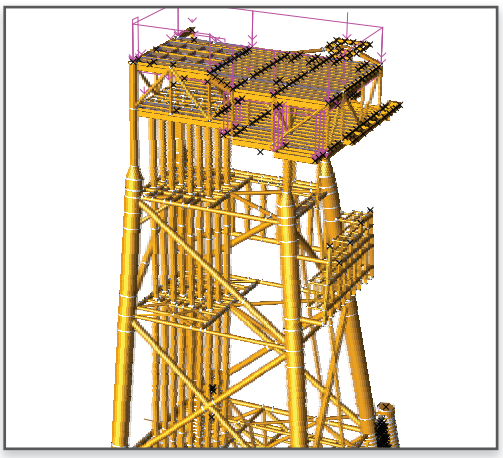
Oil and Natural Gas Company Limited | Mumbai, Maharashtra, India

Structural Integrity Assessment of a Well Platform Jacket Structure



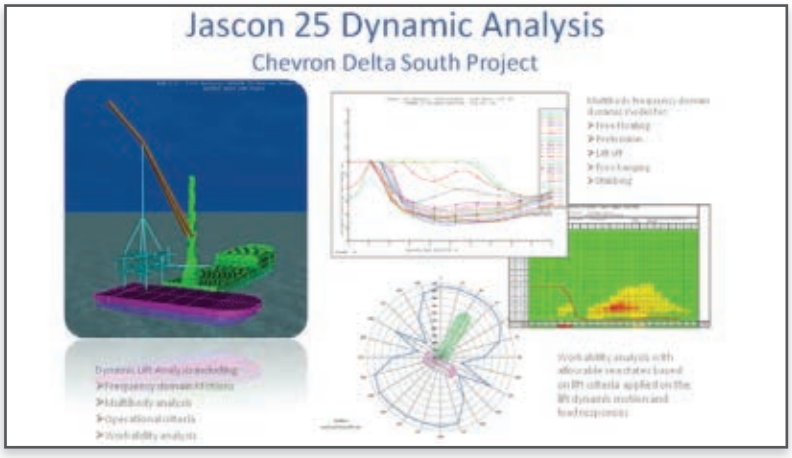


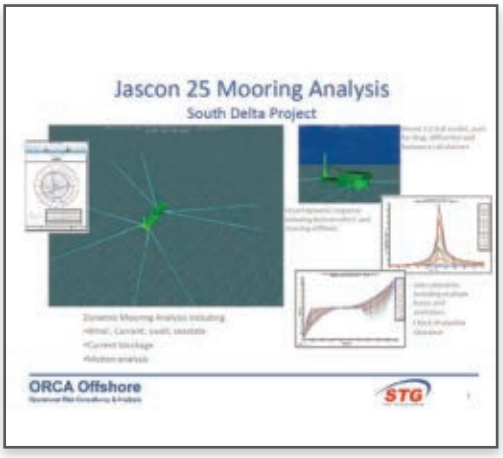
The goal of this USD 1 million project was to increase the oil and gas production of an existing platform off the west coast of India. Oil and Natural Gas Corporation Limited (ONGC) first had to enhance the load handling capacity of the platform with modifications to the topsides facilities. The project included installation of a new 13-metric-ton crane on the platform, which involved deck modifications to accommodate the pedestal and boom rest.

ONGC used SACS to perform the structural integrity assessment of the well platform jacket structure. Studying the structural response to the proposed modifications allowed ONGC to design measures to improve the load carrying capacity, and thereby reduce risk and improve safety. Using SACS saved significant time and effort, shortened the project duration, and reduced costs.

Orca Offshore | Netherlands

Shallow Water Dynamic Lift and Mooring Analysis





An offshore contractor retained Orca Offshore to perform a full dynamic lift analysis for the Chevron Delta South Living Quarters platform installation. The living quarters deck was installed on the existing Delta South Quarters platform at the Escravos field offshore of Nigeria. The goal was to optimize the lift arrangement to improve its workability under extreme swell conditions.

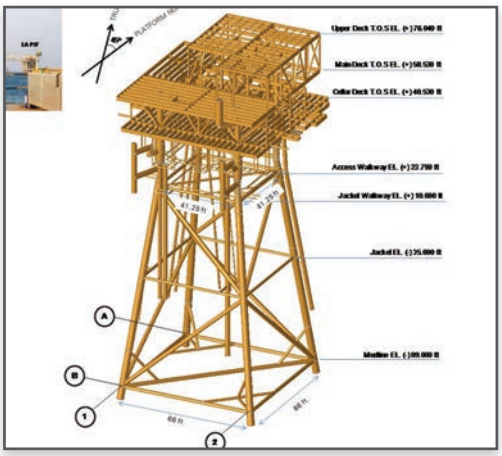
MOSES was used to perform dynamic lift analysis, verification of shallow water effect, operability analysis, and shallow water mooring analysis. To assess the operational hazard due to the small keel clearance, ANSYS CFX was used for computational fluid dynamic motion analysis and multi-body dynamic lift analysis. The mooring analysis was also a challenge, since each line had about 12 midline buoys. Using the proper analytical methods ensured the operation was safely executed.

Innovation in Offshore Engineering

PT. Timas Suplindo | Tangerang, Indonesia

LIMA Subsidence Deck Raising Project



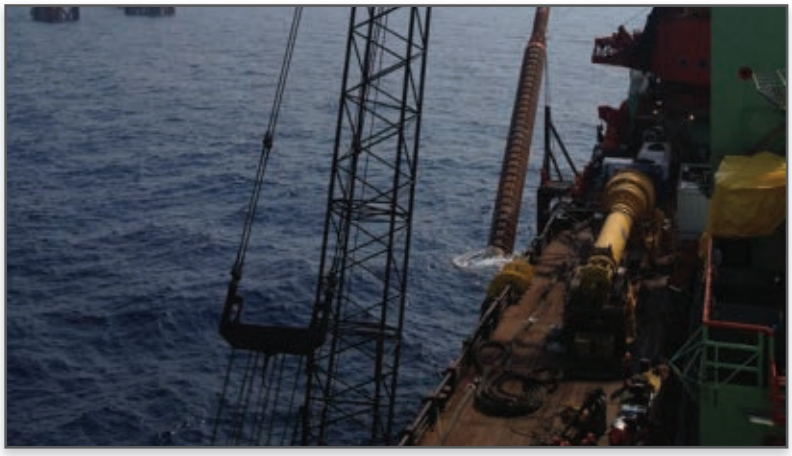


Off the coast of Banten Province, Indonesia, the LIMA Flow Station and associated installations are located above the Parigi, Main Massive, and Talang Akar formations, owned in part by Pertamina Hulu Energi Offshore North West Java (PHE ONWJ). Studies indicated the station would soon be unreliable for safe operation due to subsidence. PHE ONWJ nominated PT. Timas Suplindo for the USD 50 million LIMA Subsidence Remediation Project.

The EPCI contract involved raising the most critical platforms and facilities by 4 meters to ensure their continued safe operation through the duration of the owner's production sharing contract, which ends in 2026. PT. Timas Suplindo remedied the subsidence problem by implementing a simultaneous jacking system to raise the decks of three platforms, associated bridges, and flare tower. SACS was used in the detailed design.

Saipem | Gulf of Mottama, Myanmar

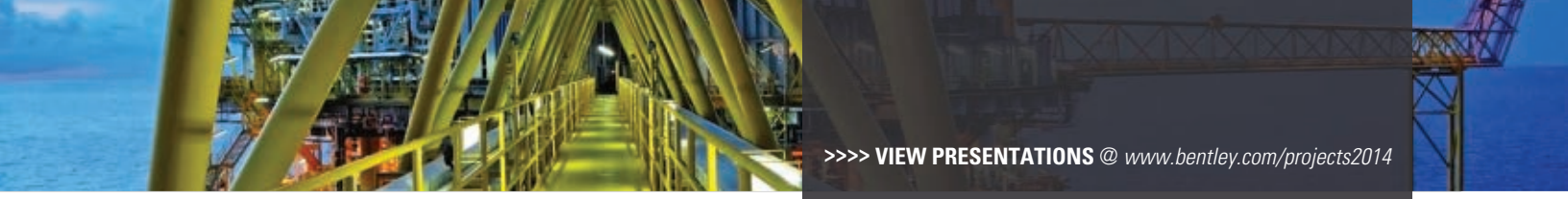
Zawtika 1A





The USD 200 million Zawtika Project is a gas field development located in the Gulf of Mottama, Myanmar. Saipem, an international turnkey contractor in the oil and gas industry, was awarded the transportation and installation contract for the Zawtika processing quarters platform and bridge. Extensive analytical work was performed to find suitable installation aids for the float-over. Various possible solutions were also studied for pile installation.

All the installation verifications were done using MOSES. The float-over methods studied and compared included active system vs. passive system, alignment position installation aid optimization, leg mating unit optimization, and hawser line connection. Methods considered for pile installation included barge side launch with buoyancy collar, and a controlled launch with a hook-connected controlled upending.



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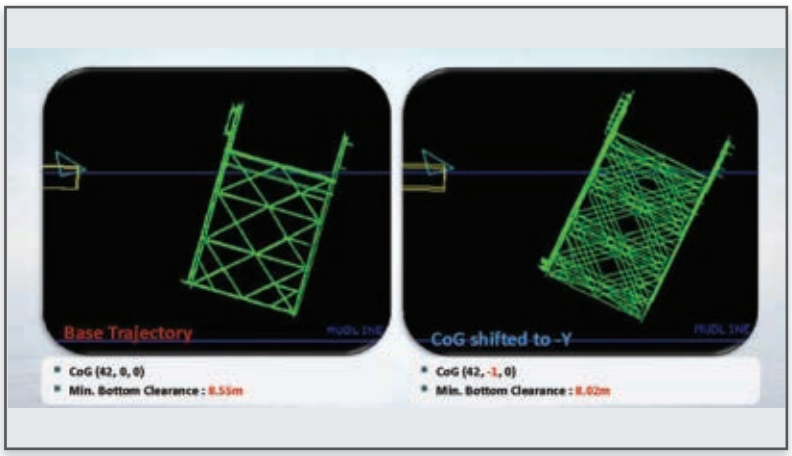
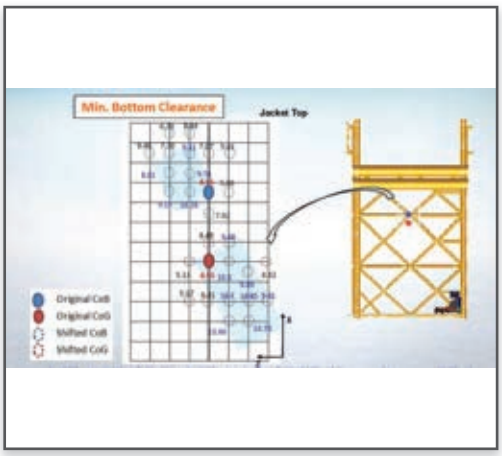
Samsung Heavy Industries | South Korea

Jacket Launching Analysis, the Parametric Study for Bottom Clearance Securement



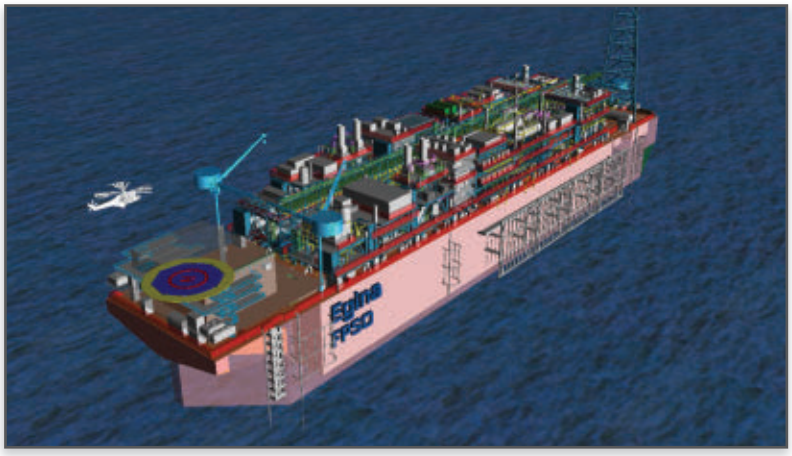


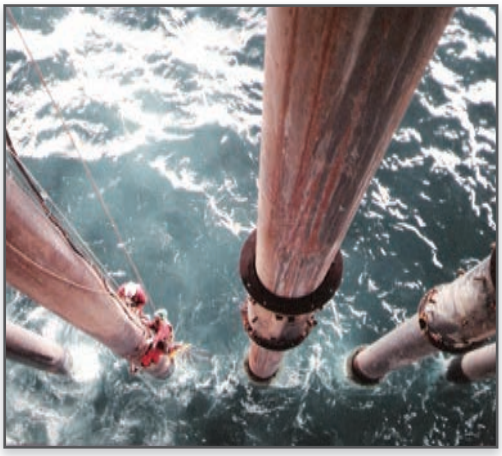
The goal of this parametric study was to analyze the factors that affect the launching trajectory and bottom clearance during a jacket launching. Samsung Heavy Industries had to check many issues, including barge mean draft, barge initial trim, buoyancy tank volume, number of buoyancy tank compartments, mudmat area, and mudmat type.

SACS enabled the project team to check by changing the barge draft/trim, in which case there was no effect on bottom clearance or relative velocity. By adding buoyancy tank compartments, clearance was secured but in damaged condition. Finally, by augmenting buoyancy tank volume and changing mudmat timber type, clearance was secured.

Samsung Heavy Industries | Geoje, Gyeongsangnam-do, South Korea

Strength Analysis for FPSO Caisson and Support Structure





Samsung Heavy Industries operates the Geoje Shipyard, which is the largest shipyard in South Korea and boasts the highest dock turnover rate in the world. Samsung Heavy Industries specializes in the building of special purpose vessels, such as LNG carriers, off-shore related vessels, oil drilling ships, and floating production, storage, and off-loading (FPSO) vessels, including this USD 3 billion FPSO caisson and support structure project.

Samsung Heavy Industries performed the strength analysis for the FPSO caisson and relevant structures using SACS, Bentley's offshore analysis and design software, as well as finite element method (FEM) analysis. Hydrodynamic loads extracted from SACS were applied to the FEM model for support structure analysis. This hybrid modeling approach is used frequently on offshore projects.

Innovation in Offshore Engineering

Urbica | Pointe Noire, Republic of the Congo
Congo Blast

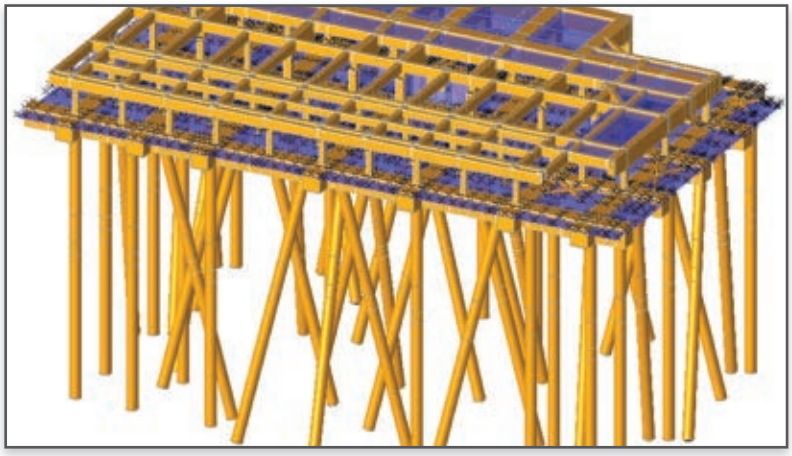


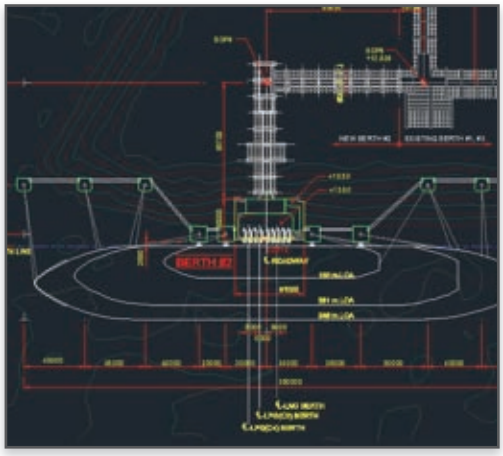


The operator of an oil field in the Congo requested a EUR 300,000 study of the risks of explosion on three oil rigs. Urbica used 3D laser scanners to produce a comprehensive survey of the facilities. Conducting a 3D laser survey only required two people to make one trip to the Congo, rather than five or six round trips for a traditional survey, which translated into a huge savings.

Bentley Pointools processed the point-cloud data then generated a 3D model for each platform that displayed as-built construction, as well as the location of gas, oil, water, and electricity. The operator used the 3D model to carry out a 3D blast simulation, verifying confined and sensitive areas on the rigs. Using the models to plan installation of new equipment limited shutdown to days rather than weeks.

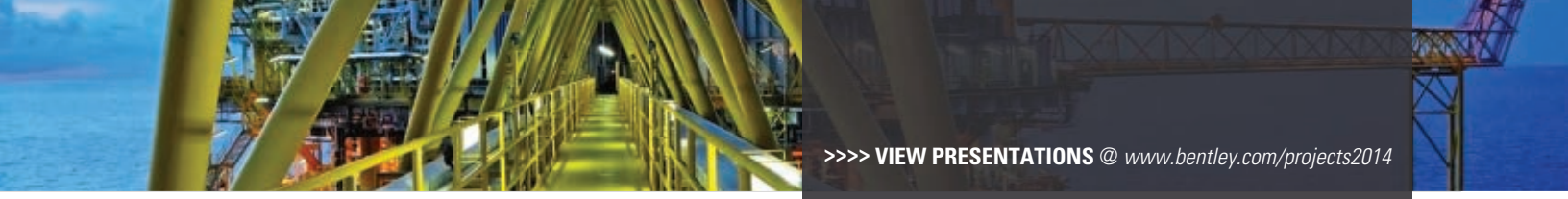
Zentech Engineering Co., Ltd | Map Ta Phut, Rayong, Thailand
PTTLNG Receiving Terminal Expansion Project – Phase II





PTTLNG Company Limited (PTTLNG), wholly owned by PTT Plc., Thailand's national oil and gas company, retained Zentech Engineering to design a USD 400 million loading platform for the PTTLNG Receiving Terminal Expansion Project – Phase II located off the coast of Map Ta Phut, Rayong, Thailand. Zentech optimized the substructure and superstructure to accommodate a capacity of 125,000-266,000 cubic meters.

Dynamic analysis was performed with SACS for each structure – including loading platform, breasting dolphins, mooring dolphins, and trestle – under operating, extreme, seismic, accidental, and mooring conditions. When changing ground conditions in the pile and soil interaction module, analysis took less time compared to cumbersome manual calculations. The optimized profile design reduced material costs.



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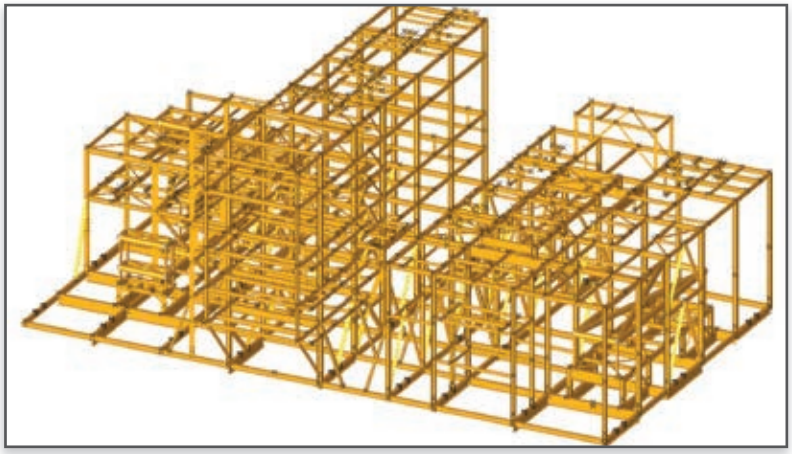
Zentech Engineering Co., Ltd | United Arab Emirates

Satah Al Razboot (SARB) Field Development Project – Package 4 EPC Work



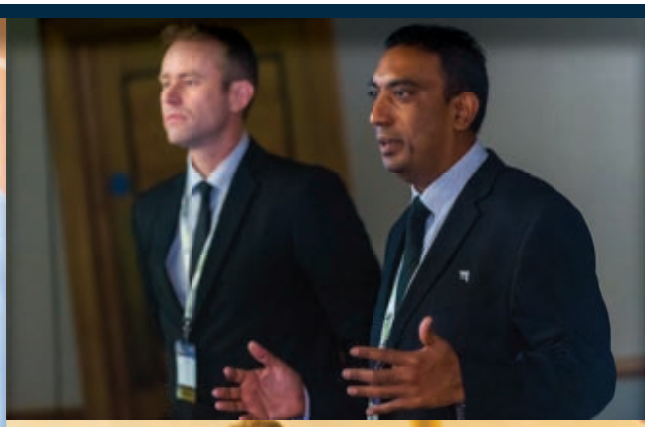


Located on an artificial island 120 kilometers from Abu Dhabi, United Arab Emirates, the Satah Al Razboot (SARB) Field Development Project involved construction of a USD 1.9 billion oil and gas processing facility for the Abu Dhabi Operating Company. The project included installation of gathering pipelines to transport oil produced from 86 wells in SARB. As part of the EPC work package, Zentech Engineering Co., Ltd., analyzed the pipe rack modules and process modules for land and sea transportation and set-down conditions.

SACS provided an efficient way to perform 3D modeling and analysis for both pre-service and in-place conditions, without having to use other software applications. SACS reduced the workload considerably compared to other methods. Optimizing the structure in SACS ultimately reduced material costs.









"MOSES software has the unique feature to be able to perform real integrated structural analysis for any type of marine structure in a dynamic sea environment, which contributes to the realization of innovative offshore structures."

– Herm Bussemaker, Managing Director, Orca Offshore



Innovation in Power Generation

Nominations in this award category have demonstrated excellence in planning, designing, building, operating, modeling, and analyzing power generation plants including traditional fossil fuel plants, combined cycle plants, nuclear power facilities, and renewable power generation facilities such as hydroelectric, solar, or wind powered.

Innovation in Power Generation

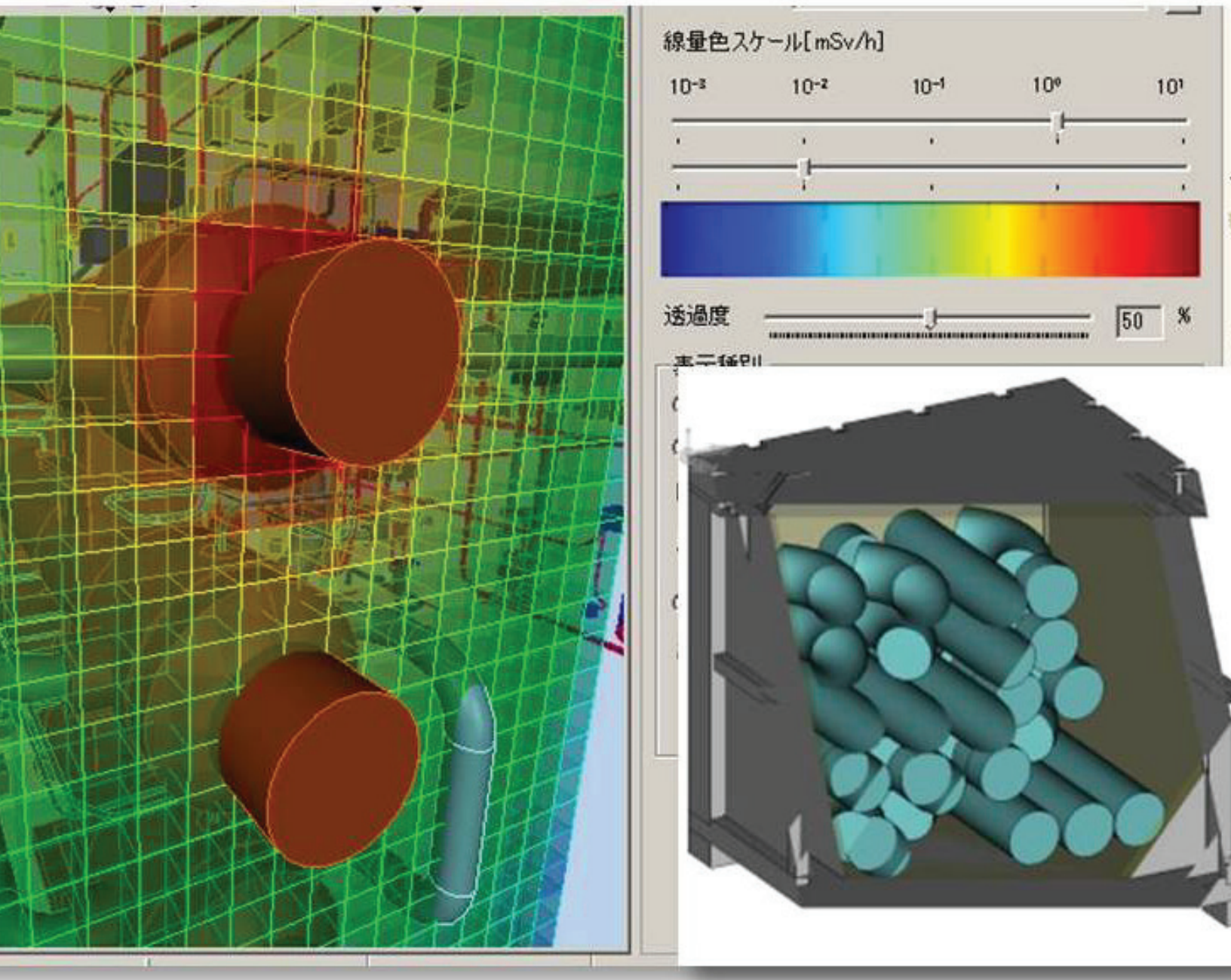
WINNER

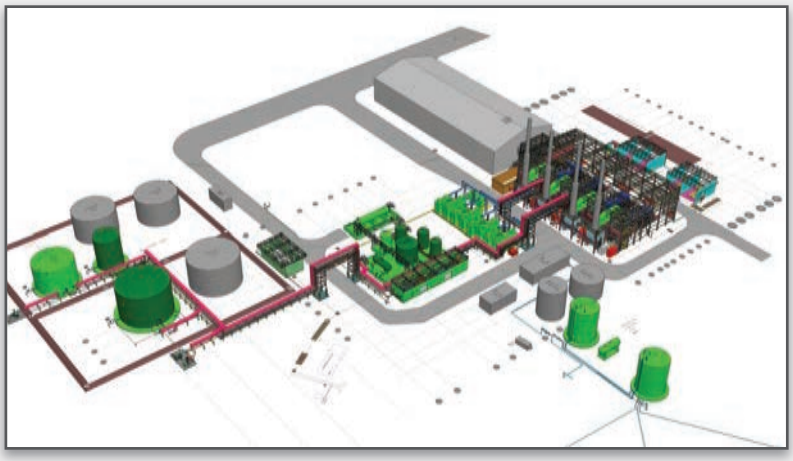
Hitachi-GE Nuclear Energy, Ltd. | Japan

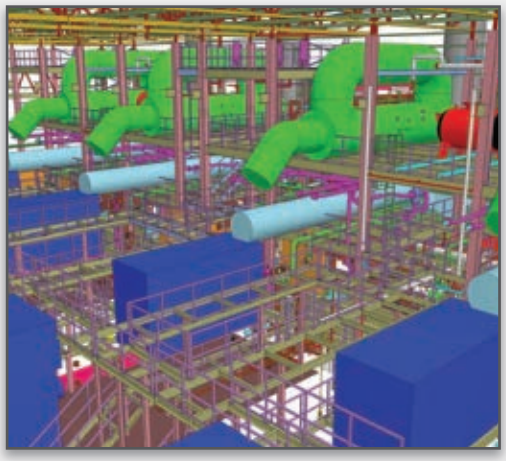
Development of Decommissioning Engineering Platform Based on Plant 3D Model

The Japanese government has begun decommissioning all nuclear reactors that are more than 40 years old. Decommissioning nuclear power plants takes as many as several thousand workers, 10 years, and a cost of JPY 36 to 77 billion per reactor. The objective of this project is to accurately calculate the amount of waste materials that must be managed as radioactive substances for each nuclear power plant.

Hitachi-GE Nuclear Energy assessed the radiation dose for workers, the number of man-hours and amount of radioactive waste materials generated from demolition, demolition procedure data, and residual radioactivity with the help of 3D models in MicroStation – establishing a safe, rational plan for demolition that will be used in the future planning of decommissioning projects. By the 2040s, decommissioning will peak at more than 50 percent of domestic plants.







FINALIST

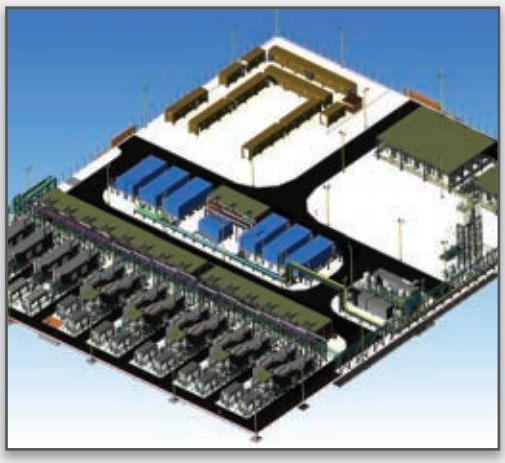
I.Y.Genesis Advanced Engineering Ltd. | Bobo-Dioulasso, Burkina Faso

Bobo II-III 54 MW Power Plant

The challenge of this EUR 43 million project was the 1.5-year time line to which EPC Telemenia had to adhere. Adding to the complexity, the project was an extension of an existing power plant in Bobo-Dioulasso, Burkina Faso, which is located 1,200 kilometers from any seaport. I.Y.Genesis Advanced Engineering was contracted to design the whole power plant except for the electrical/control/monitoring designs.

The remoteness of the site meant that material deliveries typically took three months or more. Using AutoPIPE, AutoPLANT, MicroStation, Bentley Navigator, Bentley OpenPlant, ProSteel, and STAAD.Pro on the project to simultaneously design and procure the steel structures as well as the piping systems, I.Y.Genesis Advanced Engineering was able to streamline delivery times down to two months, saving the project USD 150,000 per month in reduced construction time.





FINALIST

Kavin Engineering And Services Private Limited | Iraq

Power Plant for Garraf Development Facility Operation

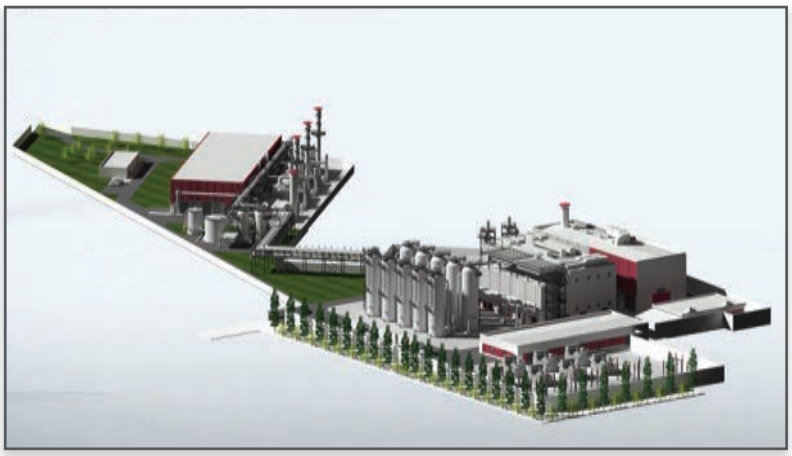
For this USD 58 million power plant project in Iraq, the remote location of the site and the extreme weather conditions required all of the materials – piping, structural elements, and steel – to be built in Malaysia, transported in containers by sea, road, and rail, and then assembled on site. This also reduced the amount of work on site, and enabled the project to be completed in a mere five months.

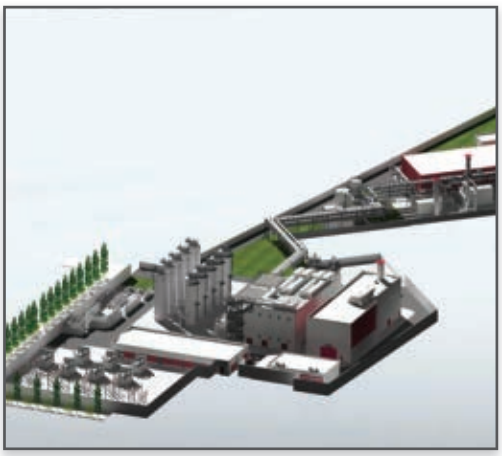
Using AutoPLANT, Bentley Navigator, ProSteel, and STAAD.Pro, Kavin Engineering And Services Private Limited extracted drawings directly from the 3D models and reviewed them using Bentley Navigator to ensure that the models were clash free. This ensured that the drawings issued to Malaysia for construction were more accurate, resulting in the company completing the project ahead of schedule and increasing profit by USD 1 million. Interoperability among applications reduced engineering time by 30 to 40 percent.

Innovation in Power Generation

Demont S.r.l. | San Donato Milanese, Milan, Italy

Enipower's Bolgiano Cogeneration Plant



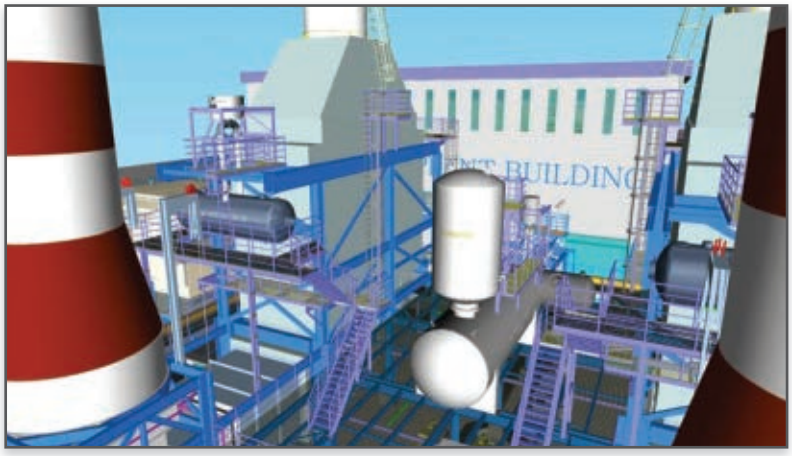


This EUR 50 million modernization project in San Donato Milanese, Italy, encompassed the redevelopment of four existing modular turbo turbines and the installation of a new medium-sized aeronautic gas turbine, two combustion engines in cogeneration, and three auxiliary boilers. Enipower tasked Demont to design the plant that will deliver high-efficiency cogeneration and more flexible operations.

Using AutoPIPE, AutoPLANT, MicroStation, Bentley Navigator, ProSteel, and STAAD.Pro, the design team created 3D models loaded with structure, piping, cable paths, and instrumentation data, which then enabled the detection of collisions among existing equipment, in particular between piping and structures. This eliminated piping length corrections during prefabrication, which guaranteed cost savings in terms of assembly time reduction.

DESEIN | New Delhi, Delhi, India

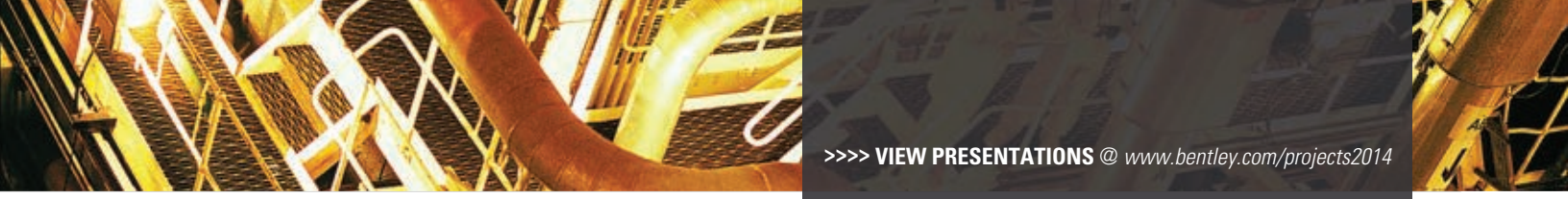
108 MW Gas-based Combined Cycle Power Project





Given the scarcity of power and the long lead time in delivery of new gas turbines, it was decided to procure an existing gas-based power plant that could be imported into India to be refurbished and commissioned expeditiously. The efficiency of the combined cycle plant will be better than the turbine cycle or steam cycle plant by an order of 45 to 50 percent.

The superior efficiency of combined cycle power plants over conventional reheat cycle plants not only conserves fossil fuels, but also drastically reduces the emissions and waste per unit of electricity generated. For this project, DESEIN leveraged the interoperability of MicroStation, AutoPLANT, ProSteel, and Bentley speedikon to save 7 to 10 percent in engineering time and 2 percent in project delivery costs.



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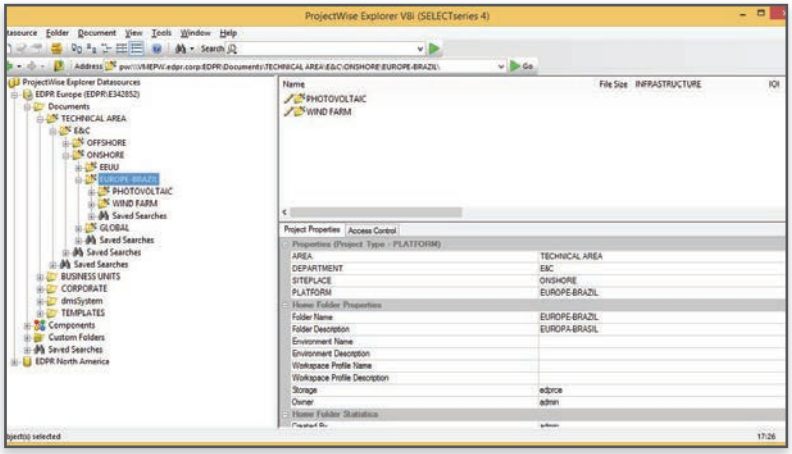
EDPR | Houston, Texas, and Madrid, Spain

ProjectWise EDPR

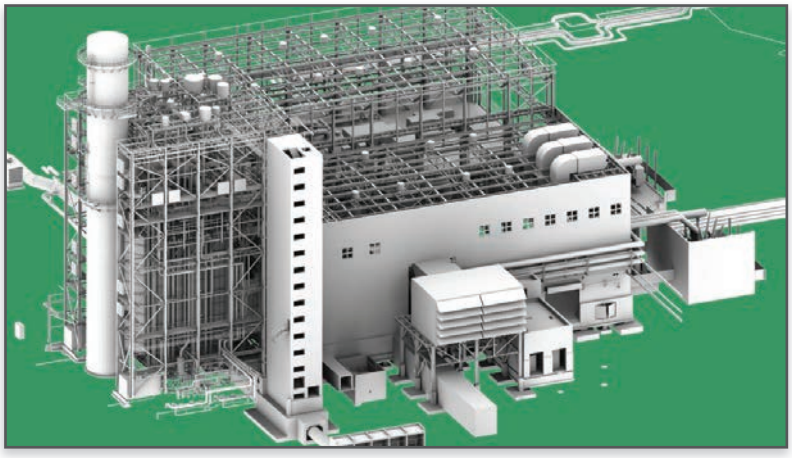


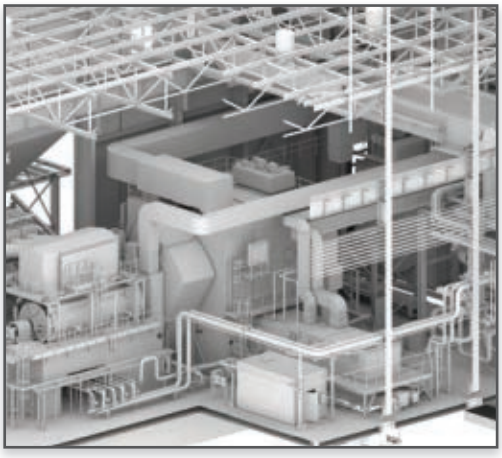
The goal of this project was to implement a technical document management system at EDPR Renewables for the entire EDPR network of more than 200 facilities in 11 countries as well as via the Web from outside the EDPR network. With centralized document management, project data would be accessible quickly and efficiently thanks to its bandwidth optimization systems, a challenge for EDPR given its locations in so many countries.

EDPR deployed ProjectWise to unify document management, which reduced the time needed to locate information, the amount of physical media to store information, and the cost of bandwidth. ProjectWise allows information to be retained indefinitely, thereby avoiding regulatory compliance issues and it provides complete traceability of the information lifecycle for complex engineering projects.

Energoprojekt Gliwice and Abener Energia | Stalowa Wola, Poland

450 MW Combined Cycle Power Plant





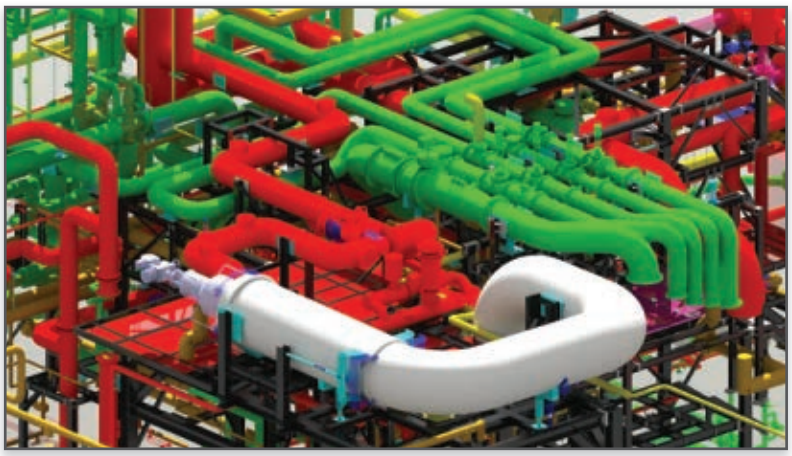
In this USD 519 million project, Energoprojekt Gliwice and Abener Energia teamed to design the Stalowa Wola power plant being constructed near an existing coal power plant in Stalowa Wola, approximately 200 kilometers from Warsaw, Poland. The new facility generates both heat and power: hot water delivered to the heating system of Stalowa Wola and process steam supplied to neighboring industrial plants.

To design the largest combined cycle plant in Poland, the teams used ProjectWise for multidiscipline work sharing. The i-model format integrated the data and enabled virtual meetings of dispersed project teams. Using i-models together with Bentley PlantSpace significantly shortened design time by detecting and eliminating collisions in the design stage, which had a direct impact on the erection phase of the project.

Innovation in Power Generation

ENERGOPROJEKT-KATOWICE SA | Dabrowa Gornicza, Poland

71 MW Power Unit at Przyjazn Coke Plant



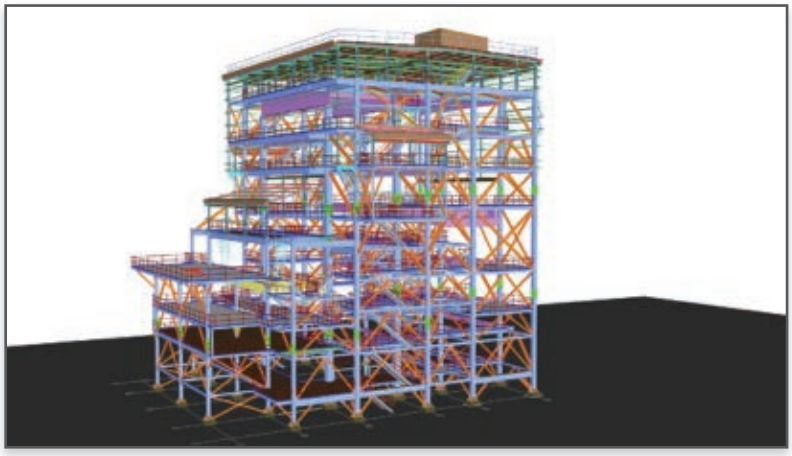


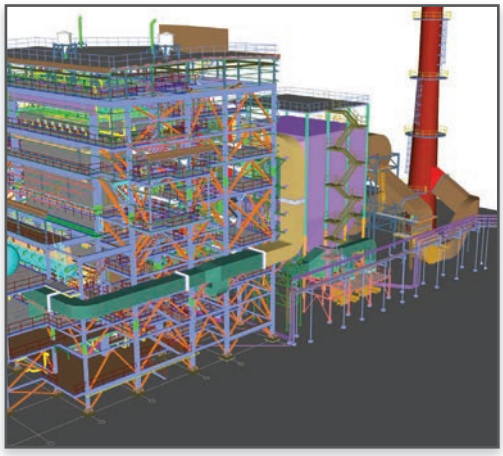
The scope of ENERGOPROJEKT-KATOWICE's USD 74 million project for JSW KOKS encompassed the design of new buildings, pipelines, and pipe racks for the reconstruction of the 71-megawatt power unit at the Przyjazn Coke Plant in Dabrowa Gornicza, Poland. The duration of the project was 36 months. The project started with civil permit design and continued through basic and detail designs.

Since various contractors and multiple design environments were involved, ENERGOPROJEKT-KATOWICE used i-model technology for data coordination and combining design data from Bentley PlantSpace, PDMS, Tekla Structures, and Bocad 3D into 3D intelligent information models that were shared among participants. Using Bentley Navigator, the team simulated the assembly of equipment to detect and resolve clashes with structures, equipment, and piping.

ISGEC Heavy Engineering | Panuco, Veracruz, Mexico

200 TPH Pinhole Grate Boiler Structure



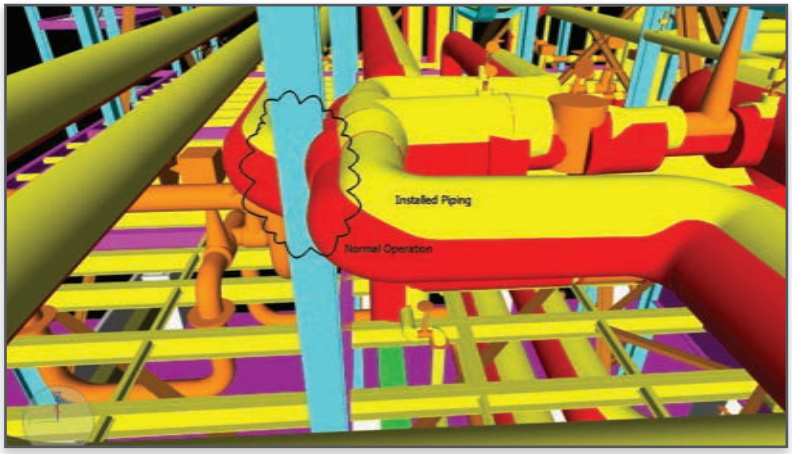


ISGEC Heavy Engineering designed and supplied a bagasse and gas-fired, pinhole grate boiler with 200-ton-per-hour steaming capacity for a 40-megawatt power plant that is being installed at Ingenio Panuco's facility in Mexico. More than 100,000 elements had to be modeled, and early detection of clashes with mechanical components ensured that the supplied items were assembled on site with no issues.

ISGEC Heavy Engineering achieved cost-saving efficiencies in all aspects of design, engineering, fabrication, and construction supported by ProSteel and STAAD.Pro. ProSteel enabled extensive information integration among mechanical, piping, and structural engineering, and reduced the number of revisions due to early detection and resolution of clashes and interferences. The project's emission control system was modeled using ProSteel.

KEPCO E&C | South Korea

Samcheok Green Power Units 1 and 2



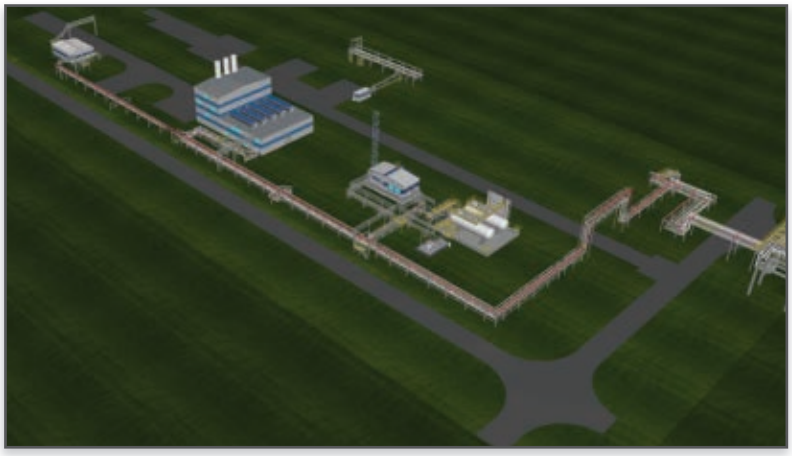


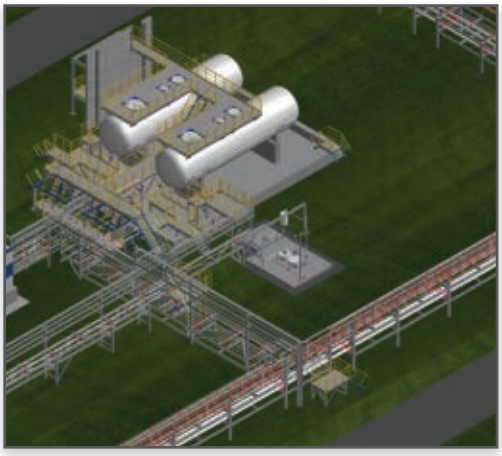
In this KRW 3,200 billion project, KEPCO E&C designed Samcheok Units 1 and 2 as part of the 1,000-megawatt, coal-fired power plant in South Korea that employs – for the first time in the world – a combination of two 500-megawatt circulating fluidized bed boilers and one 1,000-megawatt turbine using ultra-supercritical steam. KEPCO E&C designed the units for this eco-friendly power plant to promote efficiency of the gas emission control system.

The traditional method of integrating cold-state (installed) piping geometry resulted in the non-detection of clashes. So for this project, KEPCO E&C used AutoPIPE to detect piping clashes by thermal expansion. This was integrated along with cold-state piping and then reviewed in Bentley Navigator to detect and resolve clashes with adjacent 3D components such as steel structures, cable trays, and piping.

Neftekhimproekt Kosmos-Neft-Gaz LLC | Voronezh, Russia

Workshop for Burning Liquid Waste





In the harsh climate of the far north of Russia, procuring 22.54 megawatts of heat to meet the needs for the disposal of liquid waste is a challenge. LLC Neftekhimproekt Kosmos-Neft-Gaz was contracted by Pavel Leonidovich Popov to design a waste-burning facility that includes three independent lines with a capacity of 1.5 tons per hour (2 workers, 1 reserve) with the corresponding certificates and permits.

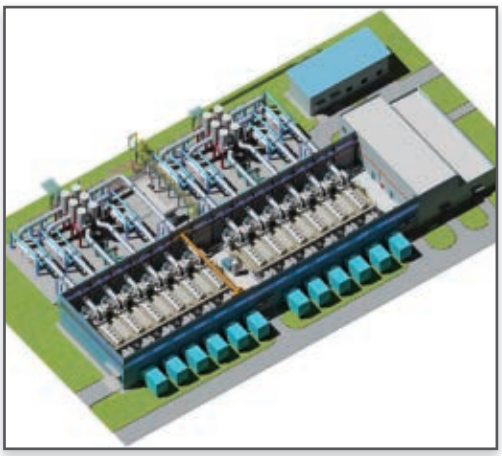
LLC Neftekhimproekt Kosmos-Neft-Gaz used MicroStation, Bentley PlantSpace, Bentley PowerCivil, Structural Modeler, and TriForma on this project. Information mobility permitted real-time tracking of changes in files of 3D models made by specialists from different departments, which made it possible to accelerate the resolution of technical issues that arose during the design process.

Innovation in Power Generation

PowerChina Hubei Electric Engineering Corporation | Nawabganj, Rajshahi, Bangladesh

Nawabganj 100 MW Heavy-oil Gas Turbine Project





For this USD 120 million project, PowerChina Hubei Electric Engineering built 12 sets of W20V32 diesel generating sets, equipped with seven sets of heat recovery boilers and 132-kilovolt switchgear, including all design, engineering, construction, inspection, testing, supply, field delivery, construction, installation, testing and commissioning, commercial operation, and supervision for the first 24 months of operation and maintenance.

AECOsim Building Designer, MicroStation, Bentley Navigator, Bentley OpenPlant, ProjectWise, Bentley Raceway and Cable Management, STAAD, and Bentley Substation were used on the project. The effective clash detection and resolution, automatic material reports extraction, and model stress calculation interfaces accelerated the design efficiency and reduced the design cost by USD 60,000. Optimizing the pipe layout and cable laying saved 500 labor hours, and project design was shortened by four weeks.





Innovation in Process Manufacturing

The projects in this award category are distinguished by excellence in the planning, engineering, construction, and operations of any process manufacturing facility, including: oil and gas facilities (either onshore or offshore, upstream or downstream), chemical and pharmaceutical plants, food and beverage factories, and pulp and paper mills.

Innovation in Process Manufacturing

WINNER

3DDraughting | Saldanha Bay, Western Cape, South Africa

LPG Import and Storage Terminal

The scope of this project for Sunrise Energy included the mechanical design of the Sunrise Energy LPG Import and Storage Terminal, located in the port of Saldanha Bay, South Africa. The completed terminal will be an open-access terminal, accessible to all qualifying LPG importers, wholesale distributors, traders, and industrial LPG users. The project is part of the South African Government's Department of Energy Strategy to supply LPG to meet fuel and energy needs for all sectors of society.

3DDraughting used AutoPIPE, MicroStation, Bentley Navigator, Bentley OpenPlant, ProjectWise, ProSteel, RAM, and STAAD.Pro for the engineering challenges that included the highly sequential execution requirements of the project. The 3D design improved the efficiency of engineering reviews and reduced decision errors and design clashes, enabling significantly more accurate fabricator contract management (fewer deviations, site instructions, and compensation events).







FINALIST

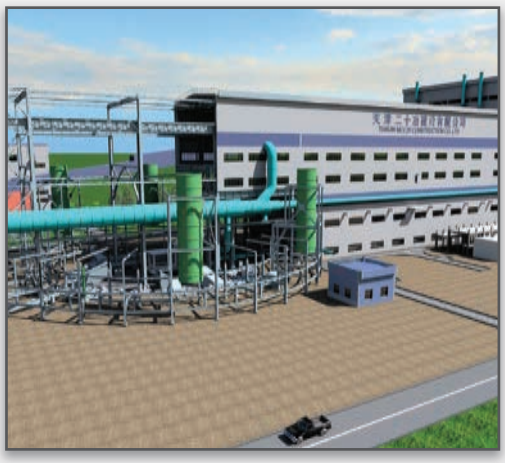
Eastman Chemical Company | Kingsport, Tennessee, United States

Journey to a New Global Information-sharing Platform

Eastman Chemical Company is a *Fortune* 300 company with more than USD 9 billion in annual revenues, 14,000 employees, and more than 40 manufacturing sites. A growing need for better information security, improved reliability, and reduced maintenance costs mandated a new information management solution that could replace a legacy in-house system but retain Eastman's proven records management process, integrate SharePoint environments, and utilize internal security policies.

ProjectWise met these functional requirements, while introducing significant productivity improvements. The lifecycle cost of the software and reduced demand on IT infrastructure and support will return nearly USD 100,000 annually. The daily use of the system will return over USD 4 million due to efficiency improvements. This project also included rigorous testing, user training, system migration, and enterprise-wide implementation.





FINALIST

Tianjin MCC20 Construction Co., Ltd | Rizhao, Shandong, China

1×600m² Sintering Machine Phase-I Project

This ferrous metallurgy project for Rizhao Steel Holding Group encompassed the construction of a large sintering plant to sinter and process iron ore. Since multiple engineering disciplines were involved in the construction and installation work for this short cycle project that will result in the largest single sintering machine in China, 3D BIM technology was used to meet the project contract in terms of schedule, quality, safety, and cost.

Using AECOsim Building Designer, GEOPAK, MicroStation, Bentley Navigator, Bentley OpenPlant, ProjectWise, and Bentley Raceway and Cable Management, Tianjin MCC20 Construction shortened construction by 35 days, reduced project costs by CNY 4.5 million, and decreased the number of changes by 95 percent through clash detection and resolution. With a return on investment of 1,100 percent, this project exceeded projected social and economic milestones.

Innovation in Process Manufacturing

3Deling Sp. z o.o. | United Kingdom
Digitising Chemical Plant

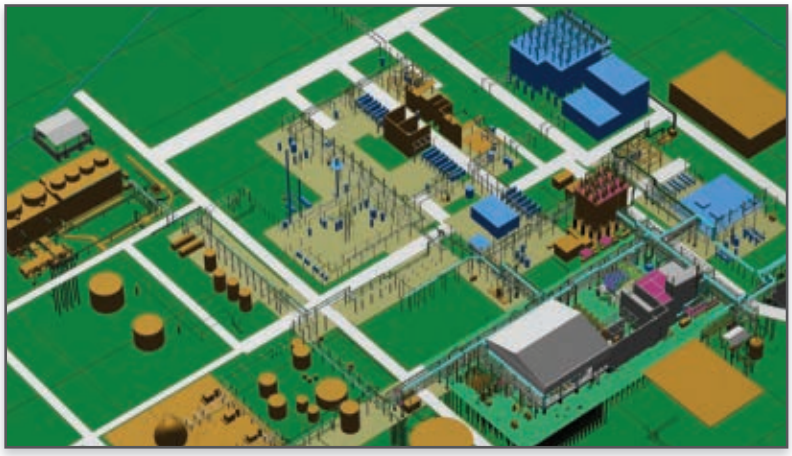


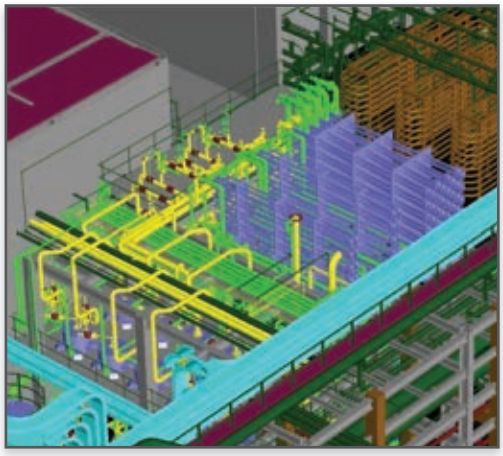


A world leader in specialty chemicals retained 3Deling Sp. z o.o. to develop a 3D model of an existing U.K. chemical plant in preparation for plant refurbishment. This EUR 50,000 project began by performing 3D laser scanning, which required more than 500 scanner setups to cover the entire plant. The result was a digitized plant whose data was accessible to the entire project team.

It was challenging to register the huge dataset into a single coordinate system. 3Deling used Bentley Descartes to perform the point cloud-to-CAD conversion. From this data, 3D models were built for units of the plant that were to be refurbished. These were used to design new structures and simulate the removal of old structures. Having accurate models shortened design time and eliminated any clashes during construction.

CTCI Corporation | Kaohsiung, Taiwan
USI 50 Kiloton-per-anum Ethylene-vinyl Acetate Copolymer Project





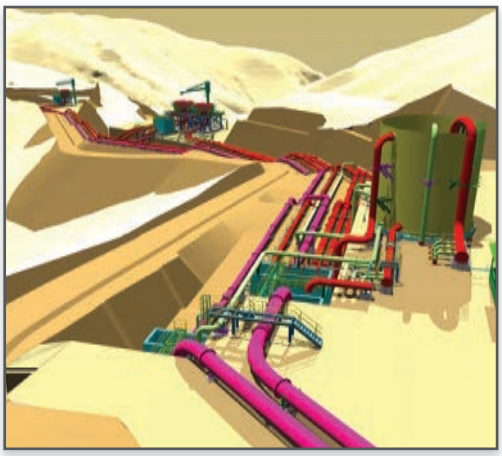
The goal of this USD 1 billion project was to construct a low-density polyethylene and ethylene vinyl acetate (EVA) copolymer production line, autoclave process, and associated areas and systems. Located in Kaohsiung, Taiwan, the facility will produce 50 kilotons of EVA annually. Taiwanese EPC contractor CTCI Corporation teamed with a Japanese company to deliver process engineering for inside battery limits and outside battery limits.

The ProjectWise collaboration platform connected the project team, as well as vendors and the owner, USI Corporation. ProjectWise ensured all deliverables were stored and organized systematically in a project repository, which reduced handover time by almost 50 percent compared with traditional manual data handover. ProjectWise also reduced by more than 30 percent the time for project members to locate day-to-day documents.

GMI S.A. Ingenieros Consultores | Arequipa, Peru

Tailing Storage Facilities, Cyclones and Tailing Distribution



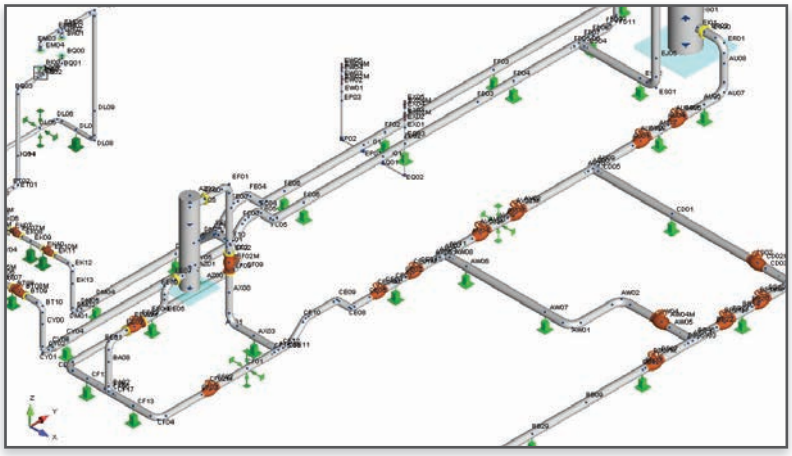


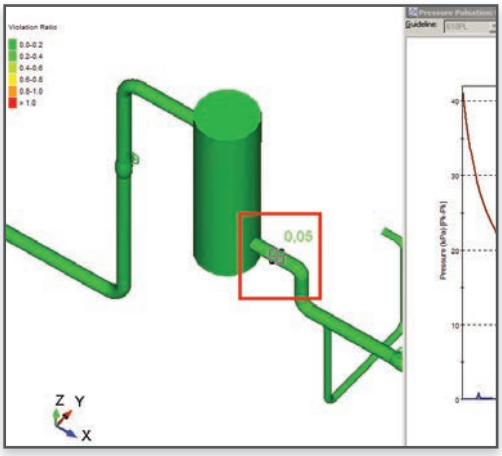
Sociedad Minera Cerro Verde is increasing concentrator capacity from 120,000 million tons per day to 360,000 million tons per day at its copper mine in Arequipa, Peru. In conjunction with this USD 4.5 billion project, a new tailing storage facility was required. GMI S.A. Ingenieros Consultores designed the facility to store approximately 2 billion tons of material deposited at a rate of 240,000 million tons per day.

Pipelines to the tailing storage facility measure up to 48 inches in diameter and 15 kilometers long. To determine the number of anchor blocks and pipe supports required, GMI imported the piping and cyclone station models into AutoPIPE and then performed the stress analysis to locate critical points. Multiple piping arrangements were tested before choosing one based on cost, viability, and security.

Komes Ltd. | Sekocin Nowy, Poland

Gas Pulsation Problems and Piping Systems Strength Assessment





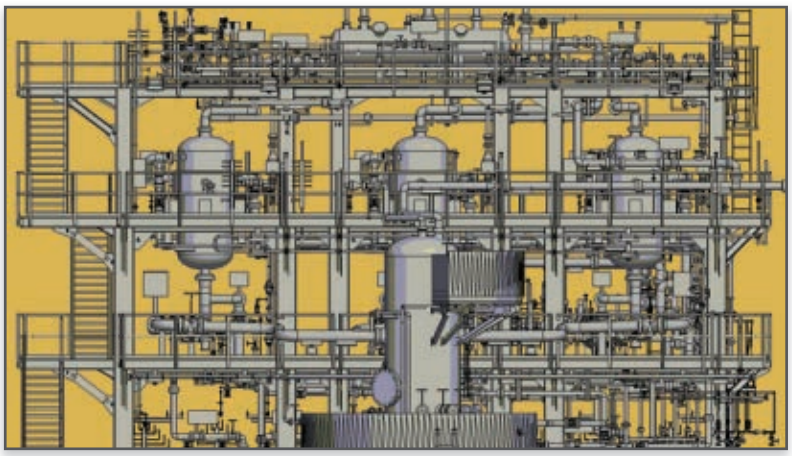
Polish gas transmission system operator GAZ-SYSTEM S.A. contracted Komes Ltd. to perform a gas pulsation analysis and piping system strength assessment for its PLN 10 million gas compressor station in Sekocin Nowy, Poland. Komes imported the structural model from AutoPLANT into AutoPIPE to perform the required analyses. The piping system model was then used in Bentley PULS to analyze pulsation pressures and other parameters.

Bentley software allowed the team to perform the pulsation, mechanical, and modal analyses effectively and efficiently. An innovative aspect of this project was the application of a new method of designing anti-pulsation bottles and vessels. Komes applied American Petroleum Institute standards to the solutions developed for the station. Bentley's software interoperability helped to reduce design time by about 30 percent.

Innovation in Process Manufacturing

Pall | Yeosu, South Korea

VGO FCC MCB Filtration System (Slurry Oil Backwash Filter System)



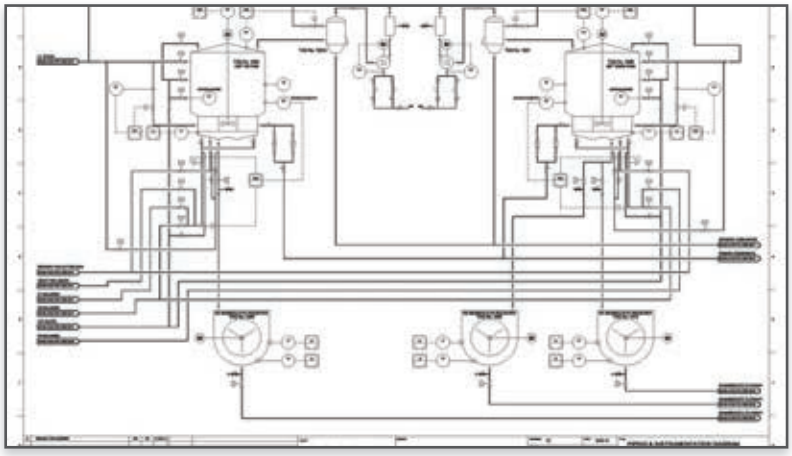


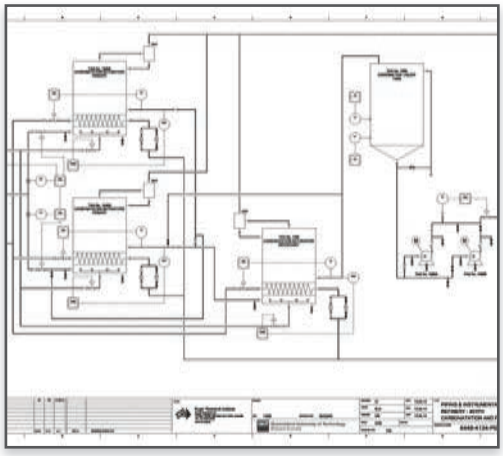
Pall, a global leader in filtration and purification system technologies, provided a filtration station for the Yeosu oil plant in South Korea. The filter system processes sluggish oil to remove solid particles and water before sending the oil for further processing. The filtered water is then recycled. The scope of this USD 5.5 million project extended from basic and detailed engineering to completion of the layout within one year.

Pall saved time by using deliverables and built-in libraries from AutoPLANT modules. During design reviews, the 3D model generated from AutoPLANT enabled the customer, South Korean energy company GS Caltex, to see the details and suggest modifications. These more efficient processes cut the design time by 50 percent and enabled the team to deliver error-free reports, when compared to previous projects.

Queensland University of Technology and GHD | Brisbane, Queensland, Australia

FEED Solution for the Sugar Industry





Sugar Research Limited (now Sugar Research Australia) invested in an AUD 250,000 front-end engineering design (FEED) project for a greenfield sugar production plant in Asia designed to process 925 tons per hour (tph) of sugarcane and produce up to 40 tph of refined sugar. The entire project was completed within six weeks and within budget. Using Bentley AXSYS.Process reduced the schedule by 54 percent.

GHD, a global professional services company, and Queensland University of Technology (QUT), an internationally recognized research institution, leveraged the combination of GHD's experience in FEED solutions and Bentley products, and QUT's sugar processing design expertise within the Centre for Tropical Crops and Biocommodities. The team reconfigured Bentley AXSYS.Process to support sugar industry requirements and integrate an interface that allowed data to be imported from the industry-standard software, SUGARS.

TomskNIPIneft JSC | Krasnoyarsk Krai, Russia

Complex Construction of First Tier Facilities on Yurubcheno-Tokhomskoye Field



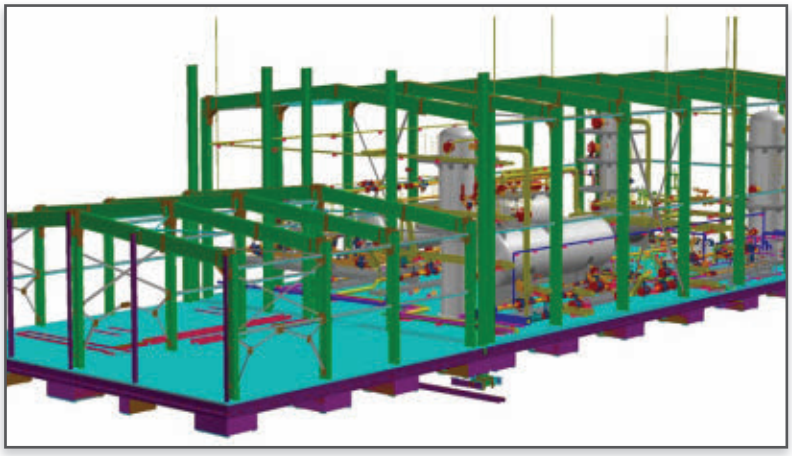


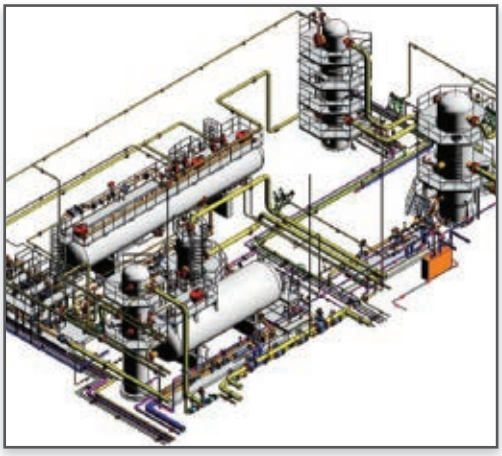
TomskNIPIneft JSC undertook the complex construction of first-tier facilities on the Yurubcheno-Tokhomskoye Field in Krasnoyarsk Krai, Russia. The oil field is being developed by Rosneft, the leader of Russia's petroleum industry and the world's largest publicly traded petroleum company. This project will connect the field to the East Siberia-Pacific Ocean pipeline to facilitate oil exports by Rosneft.

Bentley software was used at the design stage, which minimized inaccuracies at the construction stage. Modeling the pipelines enabled the project team to perform stress analyses, correctly design pipe elements, and limit stress loads on structural units. Collaboration among team members made it possible to detect and correct incompatibilities and avoid errors during construction. The team also used geospatial data for accurate communications about designed infrastructure.

TyumenNIIgiprogaz LLC | Tyumen, Russia

Developing an Information Model for a Gas Processing Plant





TyumenNIIgiprogas LLC developed a 3D information model of a gas processing plant being built by the manufacturing enterprise Achimgaz in Tyumen, Russia. The goal was to ensure the model was operable during facility construction and throughout installation of operations. While the model was being developed, a unified design environment for project participants provided access to information on equipment, products, and materials as well as organized interactions between design departments.

Design participants used Bentley PlantSpace, MicroStation, and Navigator Mobile, which helped to reduce project delivery time. The time frame for design work when collaborating on a single coordinate system was cut by about 20 percent, compared to the time spent on developing similar projects for gas processing plants.







"Eastman needed a company with a strong customer focus and a collaborative mindset to help us innovate how we handle engineering information. Bentley delivered a solution that combined innovative technologies with the one-of-a-kind functionality of our previous in-house engineering information management system. The Eastman-Bentley partnership enabled positive change management and has improved our ability to collaborate across our growing global footprint."

– Jan Shumate, Director, Plant Engineering - Worldwide Engineering and Construction, Eastman Chemical Company



Innovation in Project Performance

The projects in this category comprise those that demonstrate excellence and high performance project delivery, achieved through collaboration and information mobility. The summaries explain how project teams and organizations overcame challenges through superior project information management and collaboration, improved productivity and mitigated risk throughout the project lifecycle.

Innovation in Project Performance

WINNER

J.L. Patterson & Associates, Inc. | Tehachapi, California, United States

Tehachapi Mountains Double Track Project

This USD 80 million project aimed to improve the transport capacities of freight moving from the San Joaquin Valley in California to the eastern United States in an efficient and timely manner while reducing operational constraints. A public/private partnership between the state of California and private railroads, the project encompassed the construction of double-track segments in five locations.

The design was performed using MicroStation and Bentley Rail Track, which quickly defined the areas of potentially adverse effects on the environmental footprint from excessive cuts or fills, impacts to wetlands, and sensitive species. By using ProjectWise to share information between offices and MicroStation GeoGraphics to shorten the field verification process, J.L. Patterson & Associates reduced the time the staff would spend working an active freight rail corridor, thereby reducing the risk of job-site injuries, and also reducing project delivery, design, and construction time.





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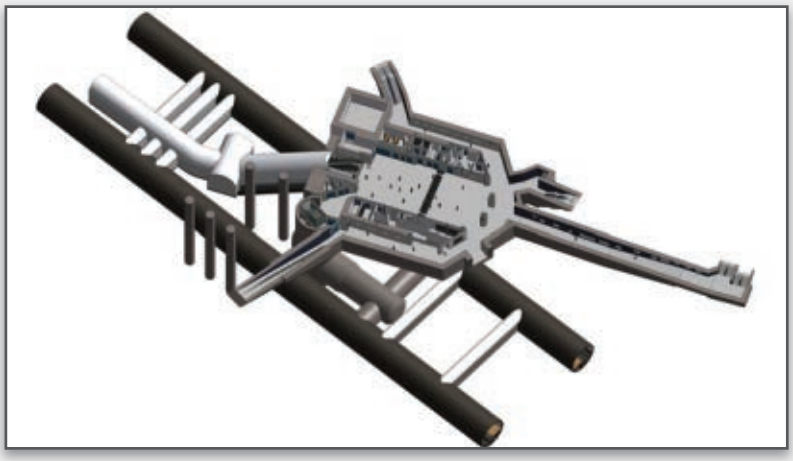
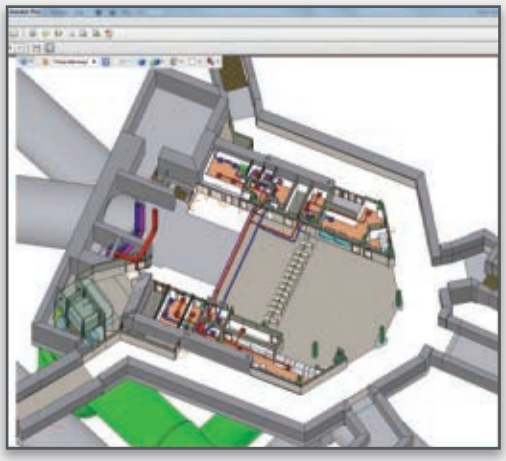




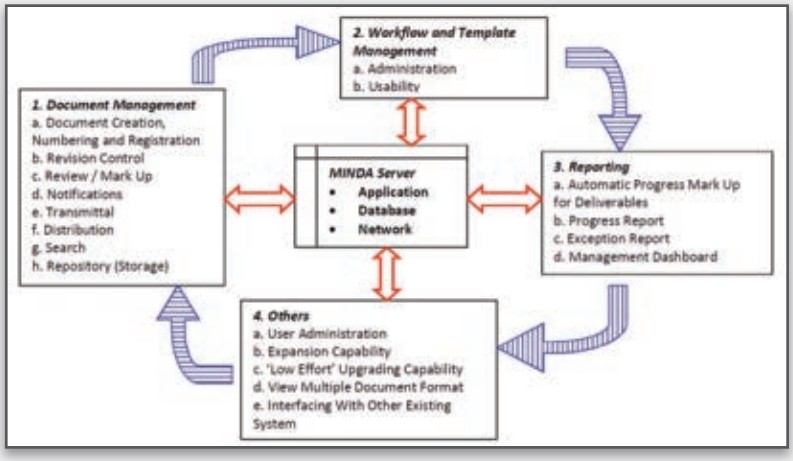
FINALIST

Bechtel | London, United Kingdom

Vauxhall Underground Station: Congestion Relief and Step-free Access Project

Vauxhall is a two-level London Underground station situated directly below the Vauxhall Cross transport interchange in the United Kingdom. The goal of this phase of the GBP 36 million project was to reconfigure the ticket hall, widen the gate line, and construct a lift/stair shaft to connect to the platforms. The station remained operational and the construction posed no inconvenience or safety hazards to passengers.

Bechtel deployed a coordinated BIM environment for the project, which provided insight into existing conditions and mapped a path forward for project execution. AECOsim Building Designer was used to create the existing and new models, and ProjectWise was used to coordinate the information from all of the agencies involved in the engineering and design of the new station. Sites leveraged handheld computer devices to collate data from the field.





FINALIST

MMC Oil & Gas Engineering Sdn Bhd | Kuala Lumpur, Malaysia

MMCOG Integrated Data Administration

MMC Oil & Gas Engineering was established in 1984 as a design engineering consultant to the oil, gas, and petrochemical industries. The company's competitive advantage lies in its specialized technical, system, and management expertise. The goal of this MYR 1 million project was to develop and implement an electronic project management system to manage and report on project documentation for engineering services provided by the firm.

The most significant time-saving activity of this system – which was based primarily on eB Information Manager and Bentley Navigator – was the reduction in review cycle times and the ability to retrieve documents promptly via search. Since automating its work processes, MMC Oil & Gas Engineering has reduced hard-copy distribution by 75 percent and reduced review cycle time by 20 percent.

Innovation in Project Performance

Bühler Group | Uzwil, Switzerland

A Worldwide Bühler Engineering Network



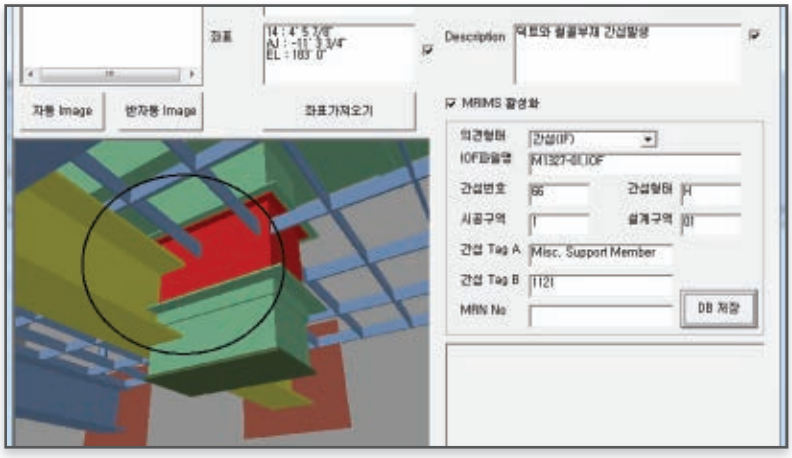


Within a few years, Bühler Group plans to have a worldwide engineering network that will provide all employees with not only the necessary tools, but also the knowledge and power to use one standard, shared source of data. Bühler Group stakeholders involved in this CHF 7 million enterprise-wide project include colleagues in Brazil, China, India, South Africa, Switzerland, and the United States.

The first challenge was compiling and clarifying the many different requirements of the Bühler Group product spectrum, not to mention a wide range of engineering division needs. The solution was to have one team responsible for not only customizing the software – ProjectWise, AutoPLANT, Bentley OpenPlant, and ProSteel – but also installing, training, and motivating the disparate Buehler Group colleagues around the world.

KEPCO E&C | Yongin, Gyeonggi, South Korea

Model Review Item Management System





KEPCO E&C's Model Review Item Management System minimizes design errors and prevents inadequate construction by tracking design review results registered in the system and managing the clash items detected by Bentley Navigator and Bentley Interference Manager. Engineers also use tools developed for extracting graphic images with engineering data, generating item identifications, and registering them to the system.

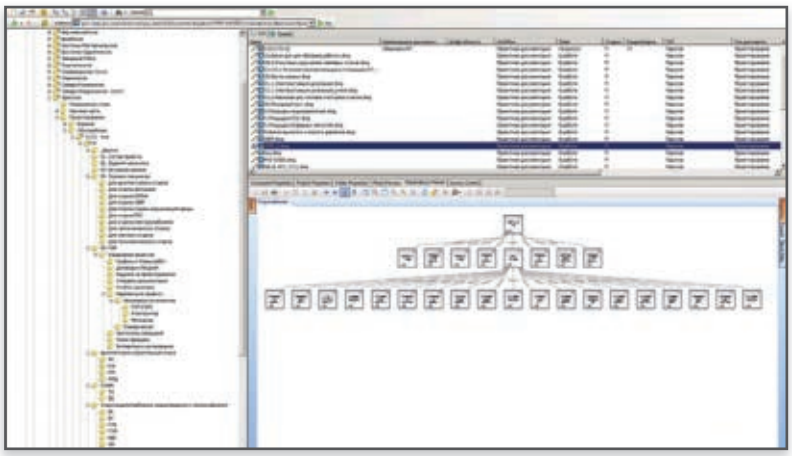
The efficiency of design review has been significantly improved by extracting and automatically storing clash detection results along with graphic images. Model reviewers check item identifications from the system, determine responsible departments, and notify relevant engineers of the item identifications. The engineers then review the 3D model for each item, revise the design based on the resolutions, and manage the revised 3D model.

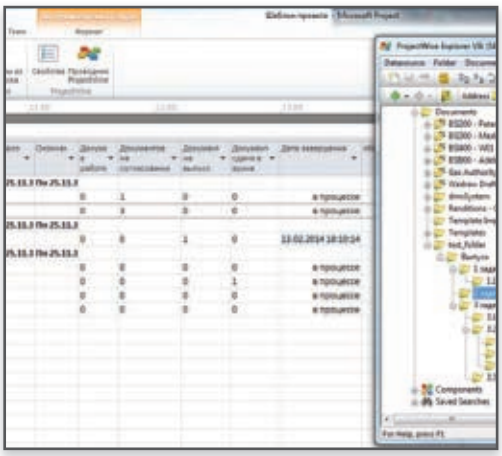




LUKOIL-Engineering LLC | Russia

An Integrated System for Managing Research and Development Manufacturing Projects



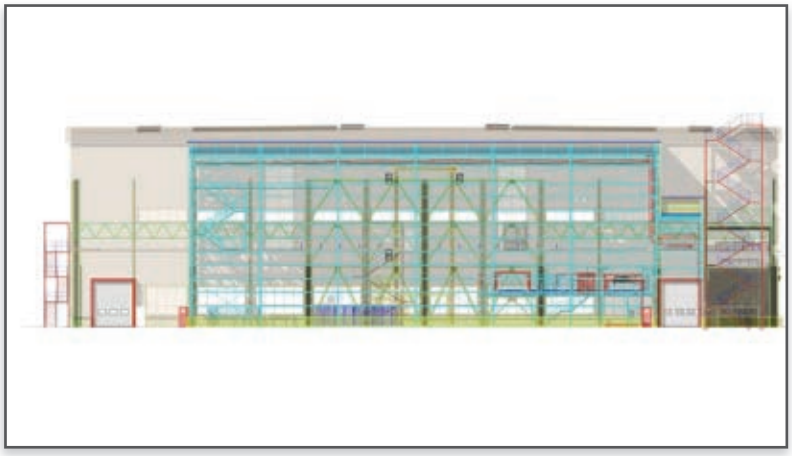


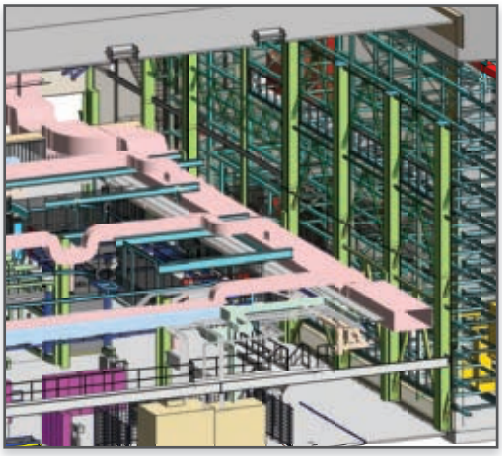
This RUB 5 million project was part of the overall ESUNPP project within the scope of LUKOIL-Engineering. The goal was to reduce the duration of the project by real-time monitoring of the project status. This was achieved by uniform access to project information, planning and tracking deadlines for carrying out work on schedule, automation of routine document tasks, and harmonization of project documents.

Using ProjectWise, the team could quickly verify and validate design project estimates and documentation. User-level access controls were implemented as part of standard system security, with the finished PSD files placed in the system to which the client was provided access. Minimizing routine operations for the participants of the project led to a reduction in work stress and tension among participants.

Mercedes-Benz España S.A. | Vitoria, Spain

High-shelf Warehouse for Frame Sequencing (ASP)





The challenge for this automobile manufacturer's EUR 1.5 million warehouse project in Vitoria, Spain, was to incorporate into existing production processes the correct coordinate system positioning and GIS special functions. Mercedes-Benz España's digital planning method was to optimize processes among product development, production planning, and factory operations.

Since MicroStation has the ability to interface to digital factory systems, it was especially well suited as an integration platform for parallel factory and management planning for all process participants, including external production partners. Shortened planning times due to collision testing on the model enabled a faster and less complicated construction process, resulting in a reduction of construction costs due to avoidance of errors.







"Bentley's products and their inter-platform exchange capabilities have allowed us to become more efficient and effective in our project deliveries to our clients."

– Marc A. Cañas, Vice President, J.L. Patterson & Associates



Innovation in Rail and Transit

This award category recognizes projects that have demonstrated excellence in rail and transit planning, design, construction, and/or operations and maintenance.

Innovation in Rail and Transit

WINNER

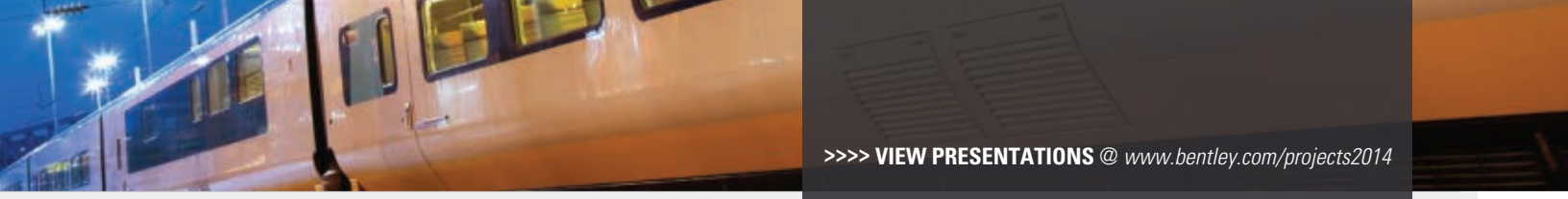
Hatch Mott MacDonald | Mississauga, Ontario, Canada

Intelligent Rail Signal Design via 2D Schematics and 3D Models

Hatch Mott MacDonald (HMM) invested an estimated CAN $150,000 to develop an intelligent rail signal design system that will reduce design time, improve accuracy, and enable standardization. The system will automate project template creation and streamline basic design checking processes, as well as provide a single database for content building. The system cuts in half the signal design time.

HMM targeted five functional categories for development: content building through a custom-made promis•e rail signals database; API project building to enable creation of an accurate 75 percent preliminary design; engineering design considerations with promis•e's automated checking tools; documentation detailing design workflows; and SQL Server and ProjectWise integration to enable sharing of drawings and access to the promis•e database. The system reduces design-phase costs by 20-35 percent.





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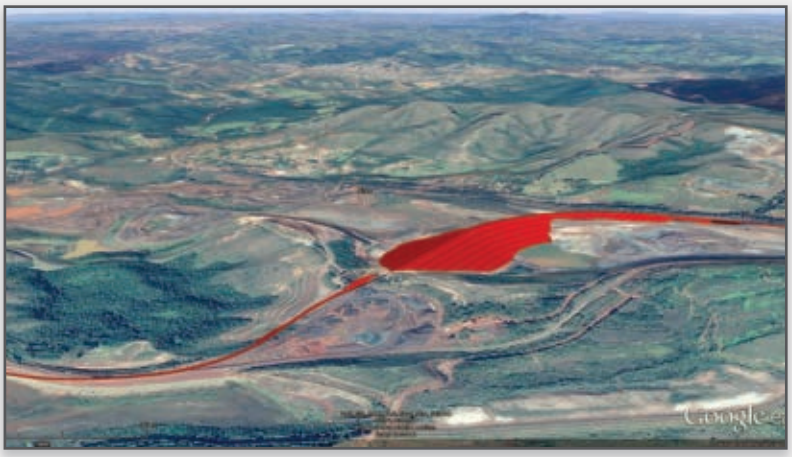
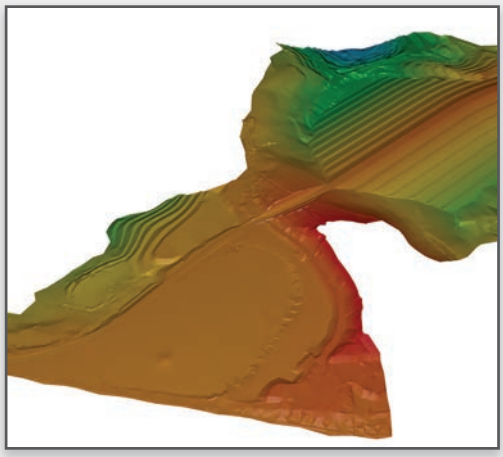




FINALIST

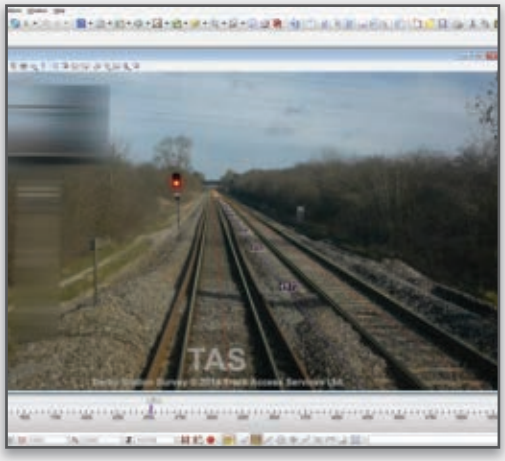
JM Souto Engenharia | Congonhas, Minas Gerais, Brazil

Detailed Project for the Adequacy of the Alternative Railway Route

In Minas Gerais, Brazil, the Iron Quadrangle produces 60 percent of the country's iron ore. New rail infrastructure is being deployed to support increased production of sinter feed and iron mine pellet at the mine pit near Congonhas. JM Souto Engenharia developed the detailed design for relocation of the branch line at the mine. The project consisted of 4.54 kilometers of rail infrastructure and superstructure.

To preserve the mining area, the layout took the rail over a sterile material landfill. Landfill geometry was adapted to accommodate an outward ramp of 1.40 percent for the railway platform grade, resulting in an earthwork section in the most critical condition with a height of about 80 meters. Bentley PowerCivil for Brazil provided an integrated environment for addressing geometry, drainage, and geotechnical issues, and reduced man-hours with quick, seamless access to project files among disciplines.





FINALIST

Track Access Services Ltd | United Kingdom

Track Access Survey and Sighting

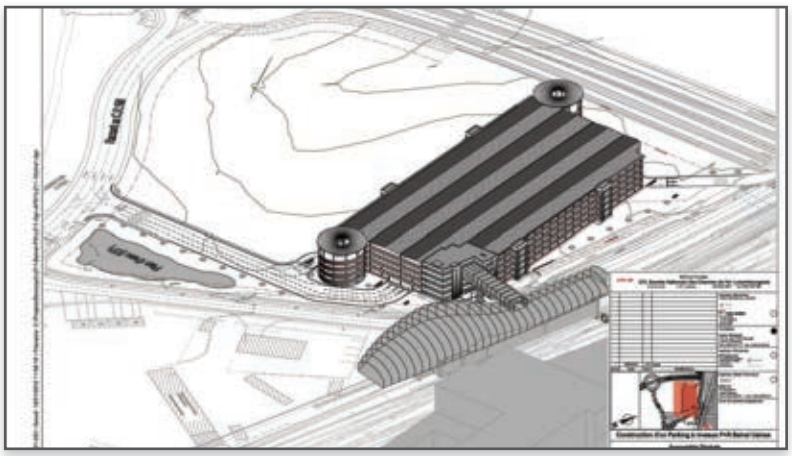
As part of Network Rail's Great Western Electrification Programme across southern England and South Wales, Track Access Services Ltd (TAS) partnered with Bentley to provide signal sighting services using Bentley signal sighting software. The GBP 391,955 project required a full positional survey of re-signaling schemes. A combination of video recordings and 3D models were imported into Bentley Rail Track for desktop signal and overhead line electrification sighting.

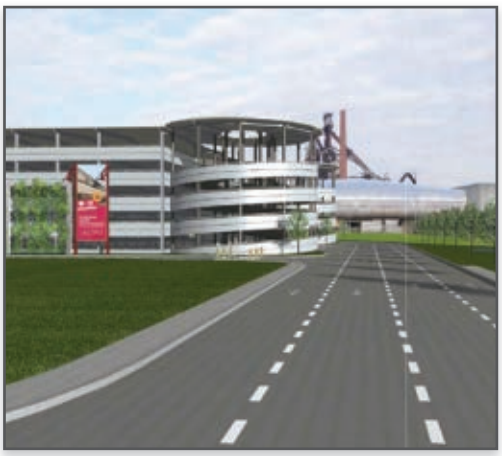
TAS developed a MicroStation application to integrate positional video footage into Bentley Rail Track software, providing unprecedented accuracy. Base models of station areas were also imported into MicroStation. The visualizations will be converted to fully functional simulation models for driver training. Performing signal sighting via video and virtual reality modeling instead of trackside visits reduced project time, cost, and risk.

Innovation in Rail and Transit

Dside, Paul Wurth, gk engineering, Lucien Zbiorczyk, and Betic | Esch-sur-Alzette, Luxembourg

Park-and-ride Facility for Belval-Usines Station





Société Nationale des Chemins de Fer Luxembourgeois (CFL), the national railway company of Luxembourg, is building a EUR 18 million park-and-ride facility for the new Belval-Usines railway station in the city of Esch-sur-Alzette. The three-phase project will attain a maximum capacity of 5,070 parking spaces. Phase 1 was completed and operational in 2013.

Under the direction of Architect Lucien Zbiorczyk, Dside supplied the architectural preliminary design plans and construction authorization plans. Paul Wurth, the project developer and builder, produced the construction documents. The use of MicroStation's 3D design tools allowed the team to avoid a number of problems. MicroStation also enabled Dside to present a visualization of the facility in its natural setting, which helped to expedite CFL approval of the plans.

Ineco | Torrelavega, Cantabria, Spain

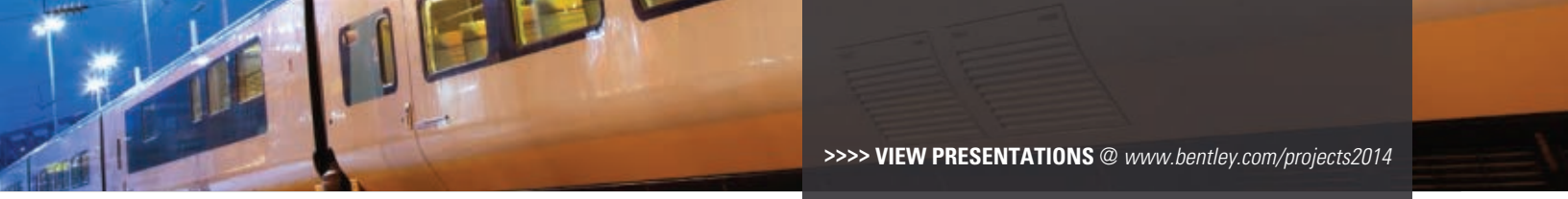
New Torrelavega Rail Station





Adif, a state-owned company under the responsibility of Spain's Ministry of Public Works and Transport, contracted with Ineco to devise an innovative solution for a hazardous rail-level crossing in Torrelavega, Cantabria, Spain. Ineco proposed a super-elevated track to pass through the city. The crossing incorporated a new passenger station and green space under the viaduct.

Integrating the station within the urban area was a major goal of the EUR 25 million project. Bentley technology, including AECOsim Building Designer and MicroStation for structures and buildings, and Power Rail Track for rail design and bridge modeling, together with BIM processes provided an integrated approach. Working with these different applications in a common data environment allowed Ineco to build a federated model, and with the BIM methodology deployed, reduced project time and operational costs by 20 percent.



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L&T Construction | Hyderabad, Telangana, India
Hyderabad Metro Rail Project





The Government of Andhra Pradesh, India, awarded Larsen and Toubro Limited (L&T) the Hyderabad Metro Rail Project, the world's largest public-private partnership project in the metro sector. L&T formed L&T Metro Rail (Hyderabad) Limited to implement the project on a design, build, finance, operate, and transfer basis. A team of world-class consultants is executing the INR 16 billion project.

The rapid transit system covers three corridors totaling about 71 kilometers of sharply curving terrain. Construction will take a metro rail viaduct over 80 road junctions. Alignment design performed in Bentley Rail Track considered the multi-faceted constraints to ensure design parameters were within permissible limits. ProjectWise enabled collaborative design and data sharing across the project team. Bentley solutions increased efficiency, saved time, and reduced project costs.

Mosgiprotrans JSC | Sochi, Krasnodar Region, Russia
Adler–Krasnaya Polyana





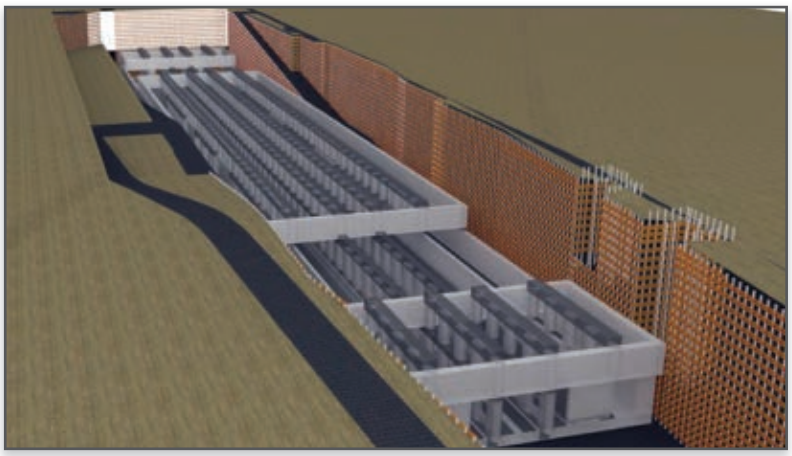
Built for the 2014 Winter Olympics in Sochi, Russia, the Adler–Krasnaya Polyana road is a combined rapid transit, automobile, and railway line running a length of 48.2 kilometers. The carrying capacity is 8,500 railway passengers per hour and 11,500 vehicular passengers per hour. The facility delivered spectators and competitors to Krasnaya Polyana sports facilities and Olympic Park ice palaces in the Imereti Lowlands.

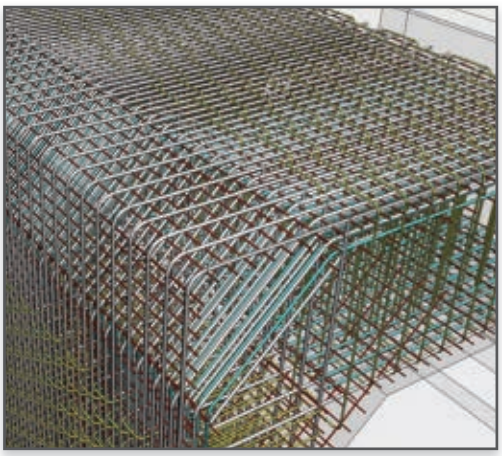
The rapid transit system covers three corridors totaling about 71 kilometers through an environment that required tight geometry and takes the metro rail viaduct over 80 road junctions. Mosgiprotrans JSC was challenged to fast-track construction while ensuring the operational reliability of the 30 kilometers of tunnels under daunting climatic, topographical, and geological conditions. Bentley technology included Bentley Rail Track and MicroStation.

Innovation in Rail and Transit

Seoyeong Engineering Co. Ltd. | Osan, Gyeonggi, South Korea

Suseo-Pyeongtaek 5th Sector KTX Station Construction BIM Design





The Korea Rail Network Authority's Dongtan Station under construction in the city of Osan, Gyeonggi Province, South Korea, is located in the fifth section of a new 61-kilometer high-speed rail line from Suseo to Pyeongtaek. This 2.6 kilometer section of the Korea Train Express (KTX) line is about 50 meters below ground level.

Seoyeong Engineering Co. Ltd. was retained by Samsung C&T Corporation to build the BIM model, which was instrumental in identifying potential design and construction problems, and supporting site management. Seoyeong optimized the construction plan using Bentley Navigator to analyze the 3D model created in AECOsim Building Designer. A 4D simulation optimized the schedule and proactively prevented delays.

SUDOP PRAHA a.s. | Prague, Czech Republic

Optimization of Railway Line, Praha Hostivar – Praha Central Station





The Czech Railway Infrastructure Administration (SZDC) retained SUDOP PRAHA for the USD 329 million reconstruction of the railway section from Praha Hostivar to Praha Vrsovice stations in the Czech Republic capital city of Prague. To improve interconnecting services between the railway, city buses, and trams and to decrease noise in the residential area, SZDC will cancel service on the existing line and eliminate the Praha Strasnice stop.

Replacing theses services will be the new Praha Zahradni Město station and Praha Eden stop, located in densely built-up areas intersecting with frequently used public transport. SUDOP PRAHA designed the project using ProjectWise for central data storage and MicroStation for design, making coordination very easy. Bentley software reduced the time and cost for project delivery by 20 percent.



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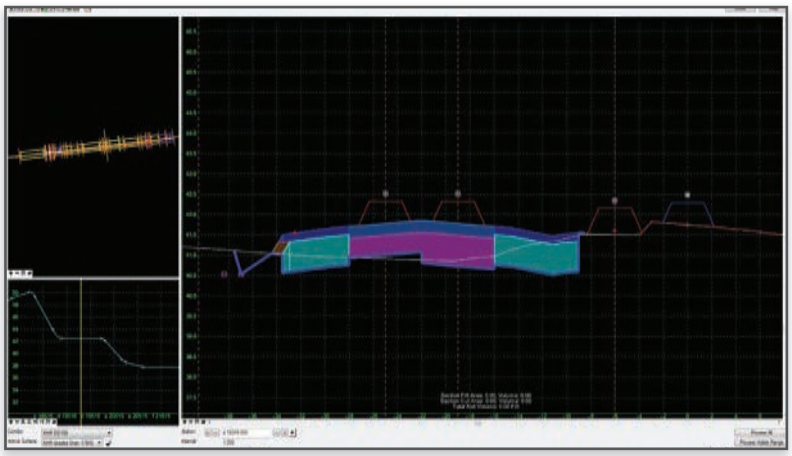
URS | Australia

Kabra Holding Roads





Aurizon, Australia's largest rail freight operator, is supporting a 27 million-ton-per-annum increase in Queensland's coal production with the Wiggins Island Rail Project. As part of this new line, the Kabra Holding Road project will provide additional infrastructure. URS was commissioned to identify viable options for two holding roads, then take the preferred option from detailed design through Issue for Construction.

Using MicroStation and Bentley Rail Track to produce all track drawings and deliverables enabled the track engineers to collaborate with other project design teams to produce a complete package. Several tools were vital to design, including the template library, drainage, hydrology and hydraulics, cross section, and plan and profile generator. The plans identified all proposed works across four tracks and presented almost all disciplinary modeling throughout the project.





"Bentley's promis•e has enabled Hatch Mott MacDonald to make a paradigm shift in design methodology thereby saving owners' time and money while providing innovative services and ensuring quality."

– Nathan Higgins, P Eng, PE, PMP, Practice Leader Rail & Transit, Hatch Mott MacDonald



Innovation in Roads

The challenge of today's civil and transportation engineers, contractors, governments, and owner-operators is to work more productively, collaborate globally, and deliver better-performing infrastructure assets. The projects in this award category have demonstrated excellence in the planning, engineering, analysis, and design of roads and highways for transportation.

Innovation in Roads

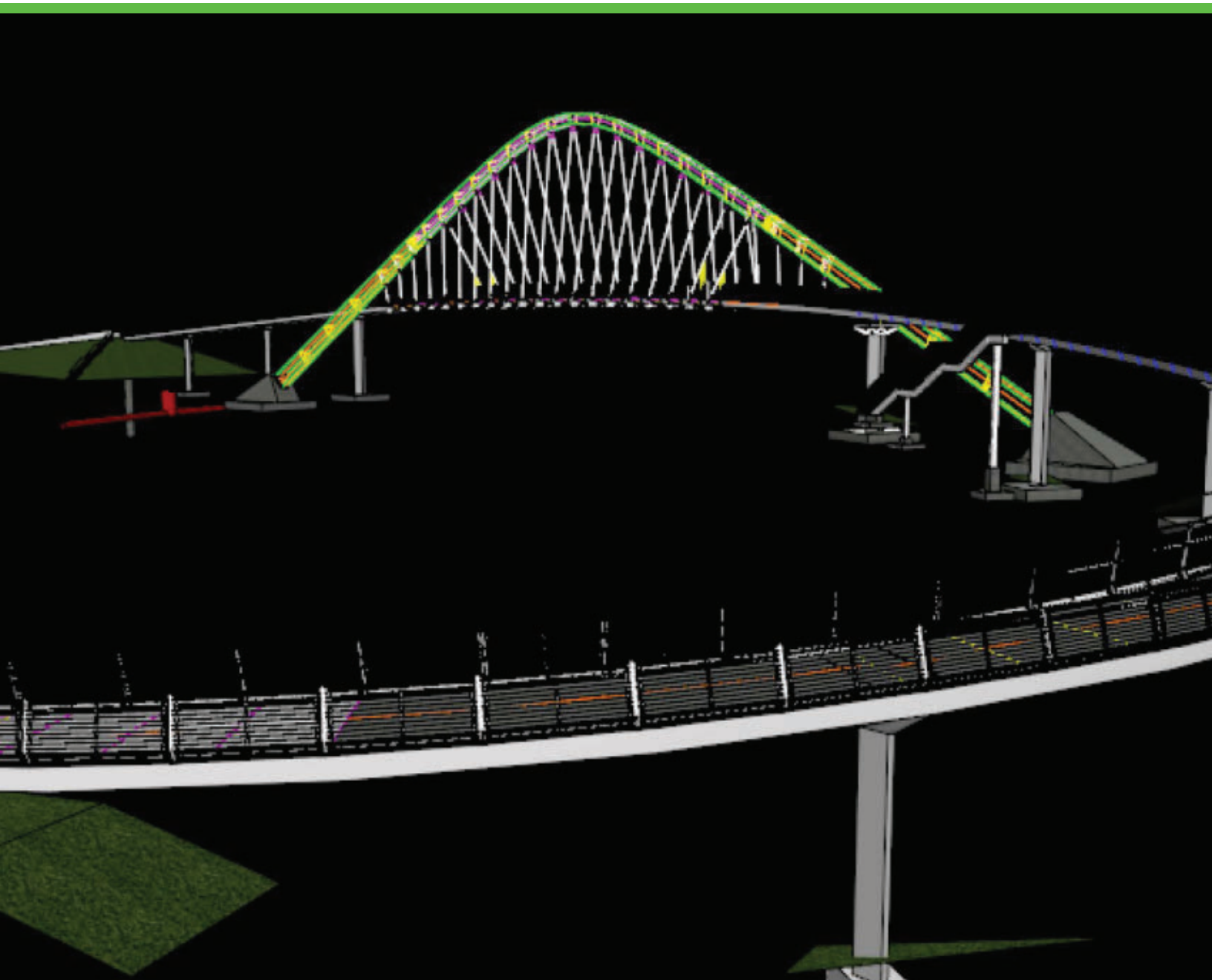
WINNER

Well-Connected Alliance | Auckland, New Zealand

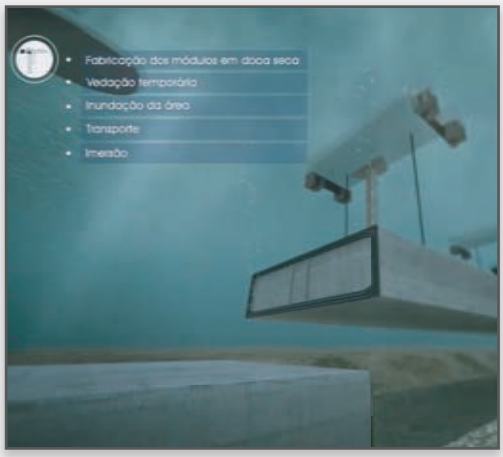
The Waterview Connection

The NZ Transport Agency retained the Well-Connected Alliance to design and construct a 4.8 kilometer section of a 48-kilometer ring road around Auckland, New Zealand. Known as The Waterview Connection, the NZD 1.4 billion project includes 2.4 kilometers of tunnels bored 45 meters deep to avoid volcanic layers. As the final link, this project will reduce travel time and congestion, while improving network reliability and resilience.

Tunnel size and rock density presented extreme challenges for alliance partners NZ Transport Agency, Fletcher Construction Co., McConnell Dowell (MacDow), Parsons Brinckerhoff, Beca, Tonkin & Taylor, and Obayashi Corporation. Using Bentley MXROAD and MicroStation for road design, tunnel modeling, and structural modeling greatly reduced design phase time. Using ProjectWise saved about NZD 500,000 in man-hours and reduced document control time to an absolute minimum.







FINALIST

Engevix Engenharia, Themag Engenharia, and Planservi Engenharia
Santos and Guarujá, São Paulo, Brazil | **Santos Guarujá Tunnel**

In the Port of Santos, Brazil, the channel entrance separates the beachfront cities of Santos and Guarujá. A new 870-meter tunnel will have 950 meters of access ramps and run 21 meters beneath the channel to improve mobility and reduce the average travel time between cities. During peak season, crossing the channel will take just two minutes, down from 90 minutes.

Engevix Engenharia, Themag Engenharia, and Planservi Engenharia partnered to engineer the BRL 2 billion project. In a technological first for Brazil, all parts of the tunnel will be built on the surface, then submerged to the channel bottom. Bentley PowerCivil for Brazil was used to rapidly develop the geometry and visualize the project. ProjectWise provided collaboration of international teams while maintaining data security. Both products reduced lead time by facilitating interaction among disciplines.

Special Recognition Award Winner Advancing Urban Infrastructure





FINALIST

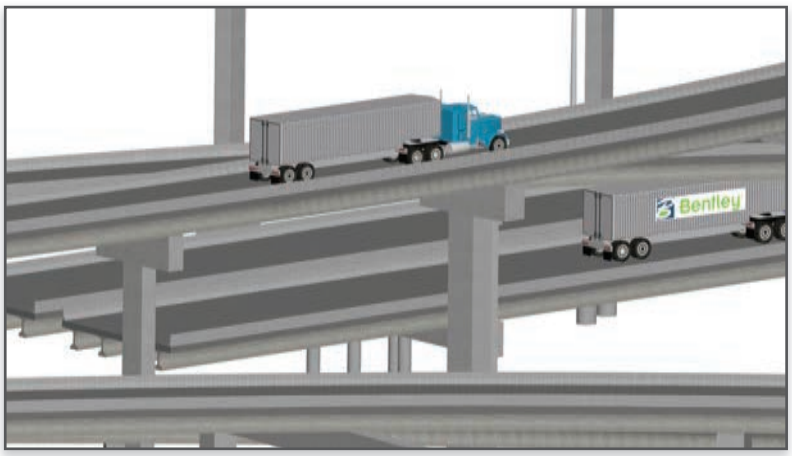
Washington State Department of Transportation | Hyak, Washington, United States
I-90 – Snoqualmie Pass East (Phase 1A through Phase 2A)

This USD 551 million project by Washington State Department of Transportation (WSDOT) will improve I-90, just east of Snoqualmie Pass, to provide a safer, more efficient six-lane freeway from Hyak to Easton. It will add a lane in each direction, replace deteriorating concrete, add and replace bridges and culverts, extend chain on/off areas, and replace the snowshed just east of the Snoqualmie Pass summit to reduce winter avalanche closures. As the project passes through a sub-alpine national forest, the roadside will be replanted with native trees, shrubs, and grasses, many of which have been cultivated specifically as part of this project.

MicroStation, InRoads Suite, and Bentley Descartes helped WSDOT increase capacity by 50 percent in each direction to accommodate projected traffic volumes for the next 20 years. The use of the process controller for distributed rendering in MicroStation saved 35 days in the fly-through/drive-through animation. The roadside restorations will not only improve habitat adjacent to the highway, but also will improve visual aesthetics for the traveling public in general.

Innovation in Roads

AECOM and Ferrovial Agroman | Fort Worth, Texas, United States
North Tarrant Express Segment 3A

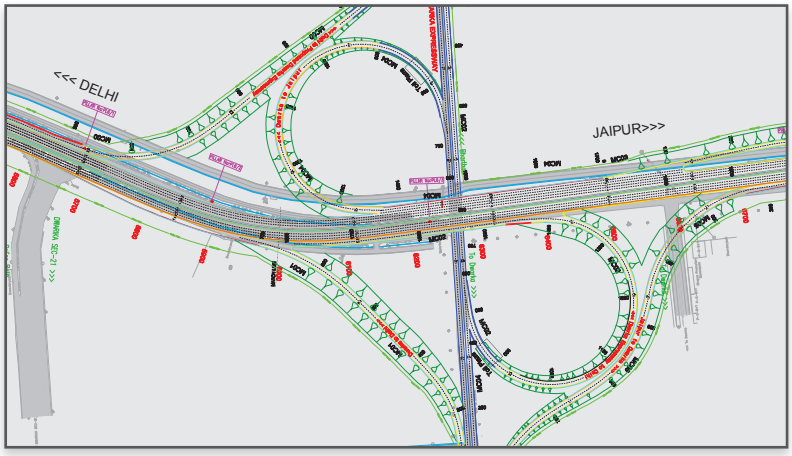


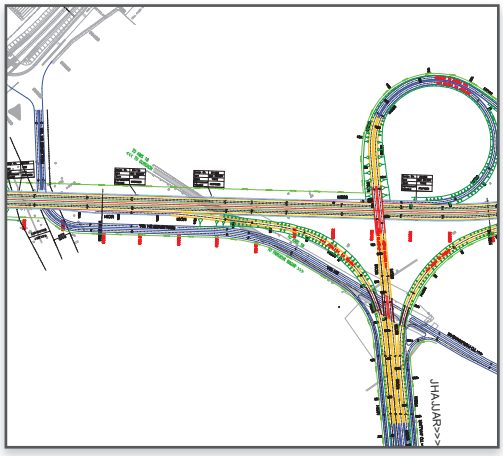


A highway expansion project in Fort Worth, Texas, the North Tarrant Express segment is a joint effort by AECOM's Dallas, Texas, office and its Madrid Transportation Design Centre in Spain to provide design services to Ferrovial Agroman. For this USD 500,000 project, AECOM implemented its innovative managed lanes concession model, which included road design, structures, traffic management, retaining wall design, and drainage design.

MicroStation, InRoads Suite, GEOPAK Civil Engineering Suite, STAAD.Pro, and ProjectWise were used for this project. AECOM overcame communication challenges and ensured design coordination through ProjectWise's real-time information modeling. ProjectWise Online saved four months in startup time (80 percent of overall project) by hosting in the cloud instead of on a custom-built IT environment. ProjectWise Online also cost 19 percent less than an onsite system.

AECOM India Pvt. Ltd. | Delhi, India
Delhi-Jaipur Greenfield Expressway





The goal of this INR 70 billion National Highways Authority project awarded to AECOM India was to conduct a feasibility study and prepare a feasibility report in respect to the development and construction of the highway and project facilities. This would enable prospective bidders to more accurately assess project requirements. The Delhi-Jaipur Greenfield Expressway passes through seven districts of three states.

Bentley MXROAD's line-mode method managed the frequent and quick modifications to alignments and road components. With a user-friendly style set that delivered accurate plotting of drawings, the software worked in conjunction with Google Earth to visualize realistic base plans that interfaced with design. Bentley MXROAD helped AECOM India save 50 percent in man-months to design this project as compared to other road design software.

American Structurepoint, Inc. | Fort Wayne to New Haven, Indiana, United States
Maplecrest Road Extension





Completed in 2012, the Allen County Highway Department's USD 31.4 million Maplecrest Road Extension is improving mobility between the cities of Fort Wayne and New Haven, Indiana. The project consisted of 1.5 miles of four-lane roadway, two new signalized intersections, one updated signalized intersection, four bridges, and elimination of two at-grade railroad crossings. American Structurepoint delivered the project one month ahead of schedule and well below the USD 50 million budget.

The roadway was constructed through commercial-industrial properties and over the Maumee River, floodplain, and eight railroad tracks. Bentley products allowed the project team to achieve efficiencies in transportation plan development. Using MicroStation and GEOPAK Civil Engineering Suite allowed multiple departments to collaborate on a streamlined project design, easily make plan modifications, and reduce design costs.

Coffey Geotechnics (NZ) Ltd | Wellington, New Zealand
Transmission Gully Project





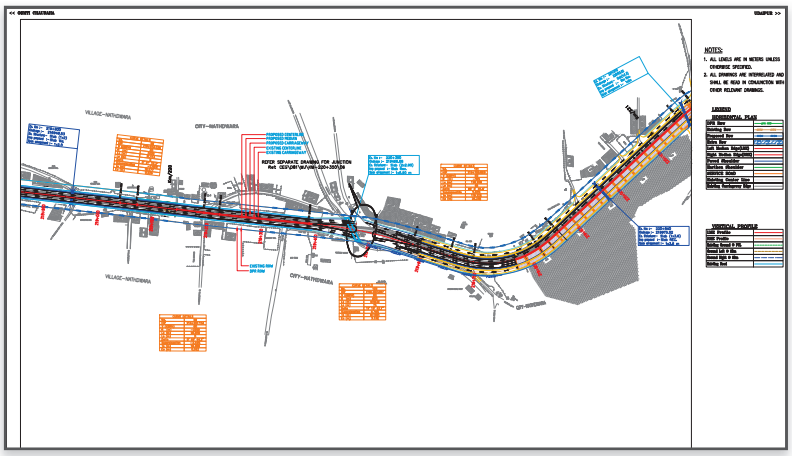
In this NZD 750 million public/private partnership, the New Zealand Transport Agency appointed Coffey Geotechnics for the Transmission Gully Project, which consisted of 27 kilometers of a two-lane highway, three interchanges, and up to 30 bridges. The proposed highway in Wellington, New Zealand, required an extremely steep gradient on its northernmost end. It also travels along a major fault line of the region, which makes it earthquake prone.

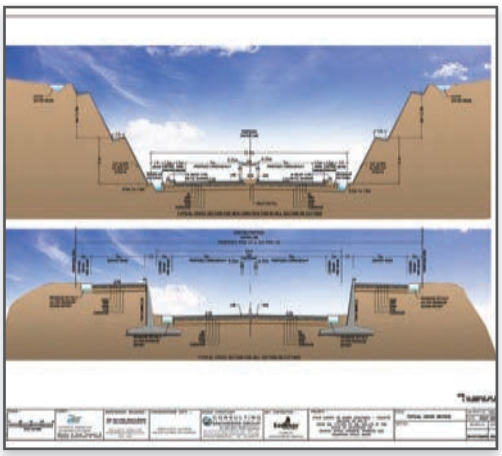
Coffey Geotechnics used gINT on tablets in the field, which provided real-time communication and collaboration between field workers and office operations. Data was able to be quickly manipulated and analyzed in the laboratory, which was absolutely critical for the design and construction teams due to the very steep gradient of the site and the existence of the fault line. It also maintained data integrity while reducing data entry times by two to three hours per day.

Innovation in Roads

Consulting Engineers Group Ltd. | Udaipur, Rajasthan, India

Detailed Engineering Design of Gomati-Udaipur Section of NH 8





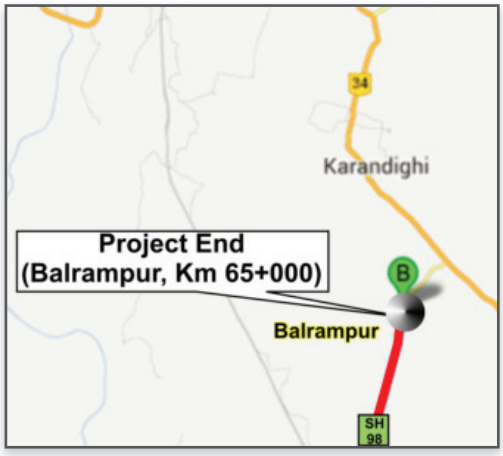
Sadbhav Engineering Limited, a leading infrastructure company of India, retained Consulting Engineers Group Ltd. to perform detailed engineering design of the Gomati-to-Udaipur section (kilometer 177/00 to kilometer 260/100) of NH 8 in Rajasthan, India. The INR 9.1 billion project is being delivered on a design-build-finance-operate-transfer basis.

Located in hilly, urban terrain, the project required an elevated corridor, a tunnel, a bypass, and cut-and-fill. The project team applied Bentley MXROAD tools to determine alignments that will cause the least disturbance to the natural topography and surrounding forest. This also optimized land acquisition and the amount of cutting and filling required. Bentley software reduced project delivery time and costs, as well as enhanced safety.

Egis India | Katihar, Bihar, India

Katihar – Balrampur (SH 98) Package VIII





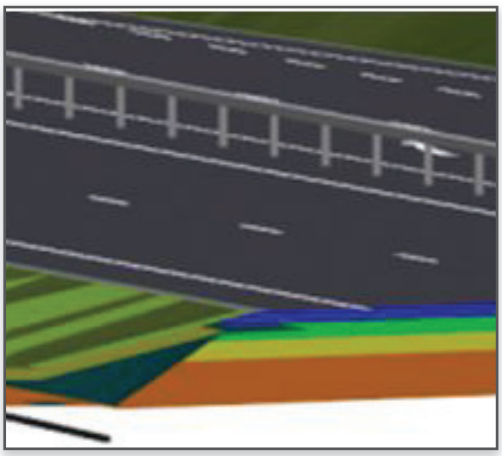
Egis India performed the feasibility study and prepared the detailed project report for the INR 3.65 billion upgrade and improvement of the route from Katihar, Bihar, to Balrampur, Uttar Pradesh, India. This work package involved realigning and expanding approximately 700 kilometers of highway from one to two lanes, as well as associated improvements to bridges, culverts, drainage, road geometry, and intersections.

The project passes through congested areas with poor road geometry. Egis determined how to improve the geometry to comply with specified standards yet with a minimum of land acquisition and settlement. The improvements will enhance the living standard and open new business opportunities for local people in this lower-income area. Using the full potential of Bentley software reduced the project delivery time and cost.



FINNMAP Infra Oy | Meltola to Mustio, Finland
Construction of Highway 25, Meltola-Mustio

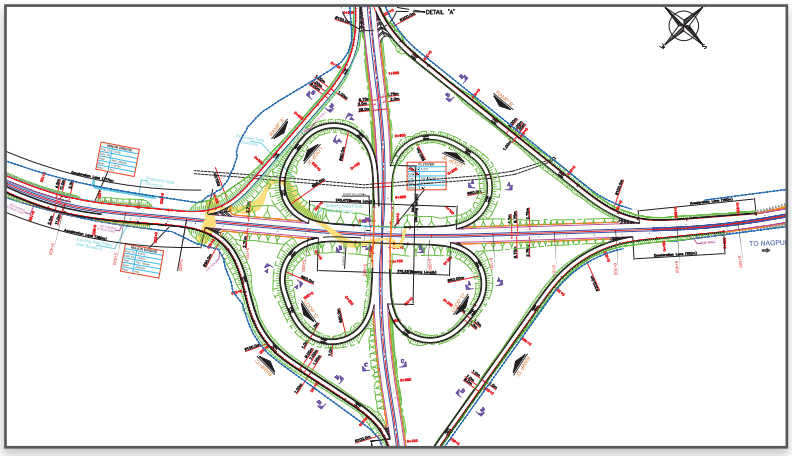


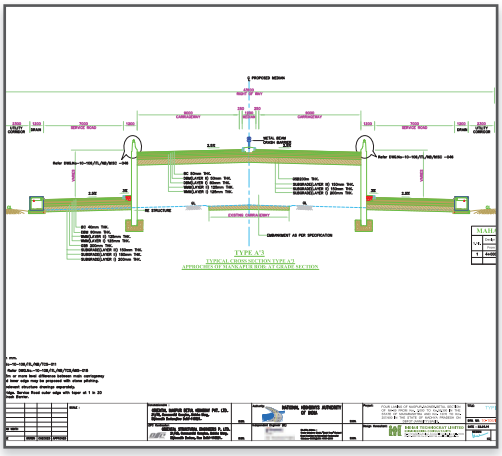


The Uusimaa Centre for Economic Development, Transport and the Environment commissioned FINNMAP Infra Oy to design a pilot program for developing and testing model-based design and machine-control models on the improvement of Highway 25. The goal of this EUR 11.5 million project was to develop LandXML/Inframodel terrain models and test them in machine control. This was to be executed in compliance with the Finnish national BIM standard called Inframodel 3.

MicroStation and InRoads Suite ensured the compatibility of the roads and bridges through clash detection and resolution, which enhanced risk management and made it easier to ensure compliance with regulations. Collaboration among project teams and stakeholders was optimized with the software's visualization and information mobility capabilities, and groundwater and historical protection site requirements were integrated into the design from the start.

Indian Technocrat Ltd. | Nagpur, Maharashtra, and Betul, Madhya Pradesh, India
Detailed Engineering Designs for Four-laning of Nagpur-Betul Section of NH 69



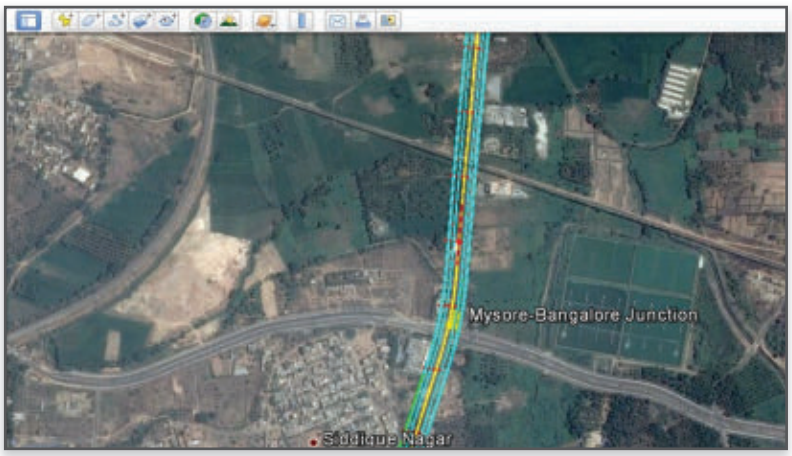


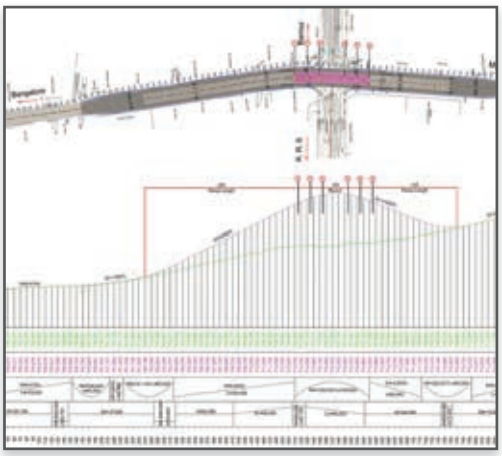
The scope of this INR 24.99 billion project awarded to India Technocrat by the National Highways Authority of India primarily involved upgrading the existing national highway section of NH 69 in Maharashtra and Madhya Pradesh to a four-lane roadway. The main objective of the project was to provide safe and efficient service levels to growing traffic movements and better connectivity to the region.

India Technocrat used Bentley MXROAD and STAAD.Pro to optimize time and resources, which resulted in a substantial reduction in the costs of project delivery during the design phase and, more importantly, during the construction phase. The software's 3D capabilities saved 40 percent in design cycle time, 50 percent in communication/travel costs, 75 percent in presentation approval time, and 20 percent in construction costs.

Innovation in Roads

Infra Support Engineering Consultants Pvt. Ltd. | Mysore, Karnataka, India
Bangalore Road-ORR Junction Grade Separators





The Mysore Urban Development Authority contracted Infra Support Engineering Consultants Pvt. Ltd. to prepare the feasibility report and detailed project report for the proposed construction of Bangalore Road-ORR Junction grade separators in Mysore, Karnataka, India. The project team had just eight weeks to complete the design and ground check, and submit drawings and reports for the INR 220.1 million project.

Bentley MXROAD Suite quickly created alternative designs for optimum alignments and profiles. Visibility analysis ensured that the designs met safety requirements. The design met project goals for reducing intersection congestion and travel time, reducing the cost of delays and idling, and reducing accidents and conflicts. Bentley software decreased project delivery costs by integrating multiple engineering disciplines and enabling participants to take responsibility for their roles.

Korea Engineering Consultants Corp. | Incheon, South Korea
BMW Driving Center Construction

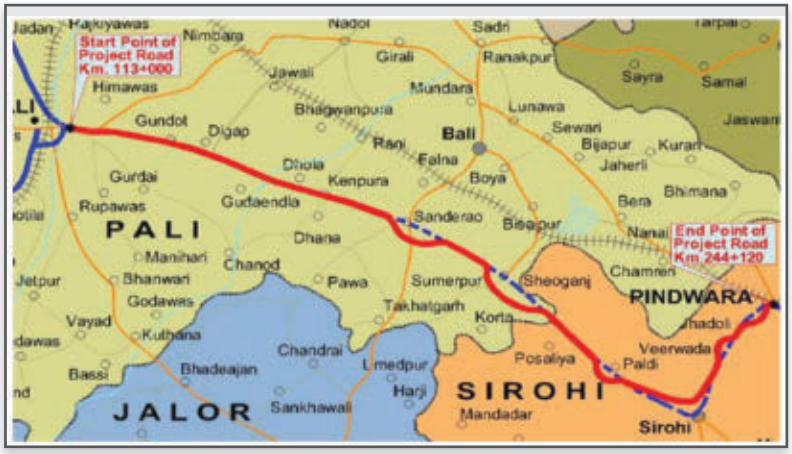


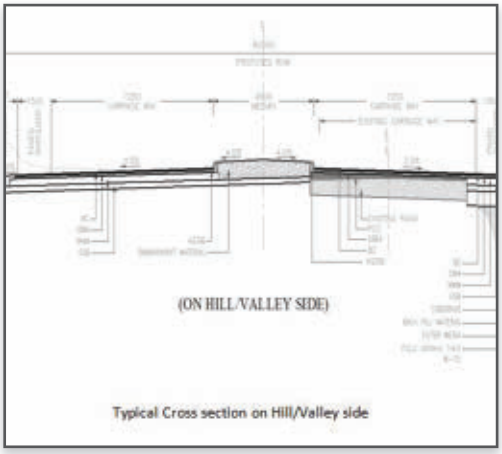


The KRW 40 billion BMW Group Driving Center in Incheon, South Korea, features driving tracks as a main facility, an exhibition and experience space for automobile culture, and an eco-friendly sports park. Korea Engineering Consultants Corp. performed the feasibility study and detailed design using the BIM method. A key challenge was meeting the standards of Fédération Internationale de l'Automobile (FIA), the governing body for world motor sport.

The track is composed of multi-purpose, dynamic, circular, accelerating and braking, handling, and off-road courses. BIM design using InRoads delivered the track connection (edge) design that satisfied FIA regulations. In addition, a design considering utility interferences in the lower part of the track minimized changes during the construction. By analyzing potential problems and minimizing errors, InRoads 3D modeling reduced construction costs.

L&T Construction – Transportation Infrastructure Independent Company | Beawar to Pali, Rajasthan, India
Four-laning of Beawar-Pali Stretch of NH 14

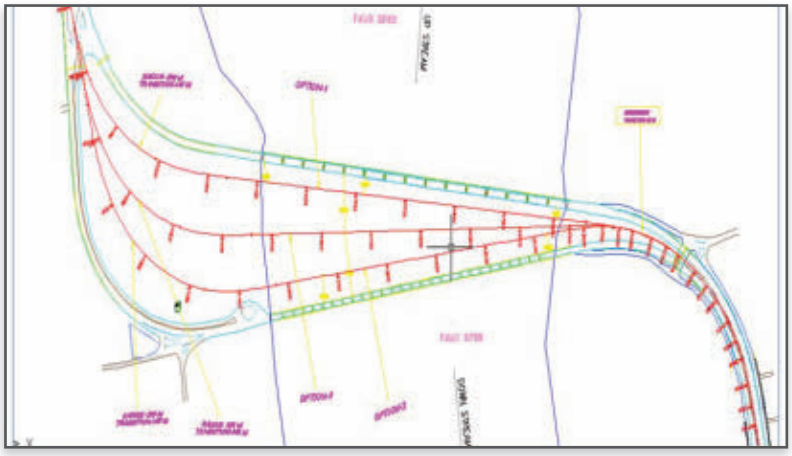




L&T Construction's Transportation Infrastructure Independent Company designed the rehabilitation, widening, and strengthening of a 244.12-kilometer stretch of NH 14 from Beawar to Pali in Rajasthan, India. The INR 8.55 billion project converted a two-lane highway into a four-lane divided highway under a design-build-finance-operate-transfer scheme. The project will reduce traffic congestion and accidents, as well as improve access to major cities.

The National Highway Authority of India's tight timeline for the project challenged the team to deliver the best possible design for the hilly terrain while staying on schedule. The analysis tools in Bentley MXROAD allowed the engineers and designers to identify potential problems during the design phase rather than incur the high cost of re-work on site.

L&T Construction – Transportation Infrastructure Independent Company
Krishnagiri to Walajapet, Tamil Nadu, India | Six-laning of Krishnagiri-Walajapet Stretch of NH 46





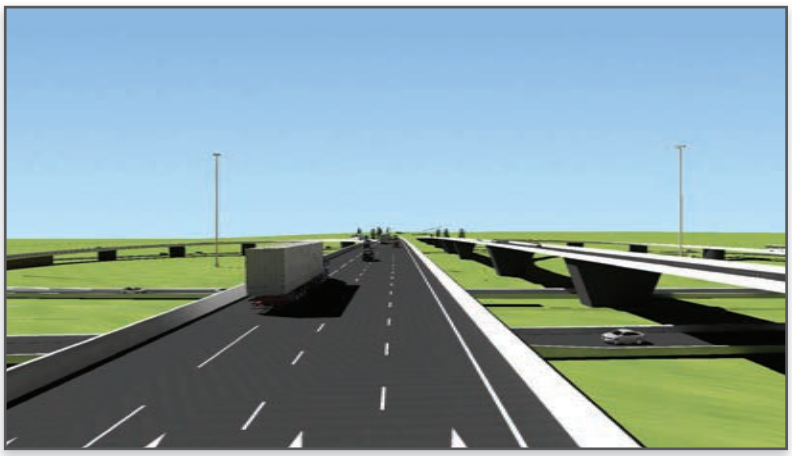
The National Highways Authority of India retained L&T Construction's Transportation Infrastructure Independent Company to perform detailed design for rehabilitation of the 148.3-kilometer stretch of NH 46 between Krishnagiri and Walajapet in Tamil Nadu, India. The INR 10.63 billion project will widen the carriageway from four lanes to a six-lane divided carriageway.

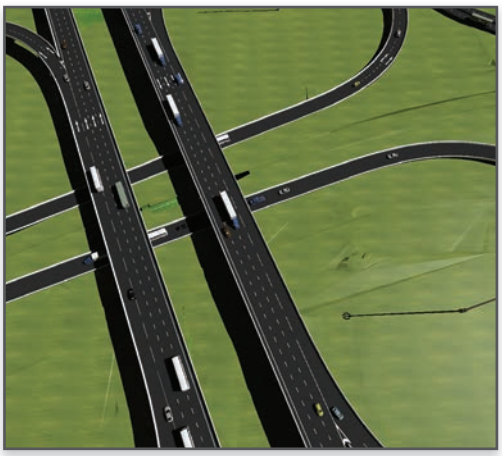
With just six months to complete the design, the project team used Bentley MXROAD to optimize the alignment and quickly finalize the design. Bentley software was used to create drawings for the main carriageway plan and profile, service road plan and profile, drainage plan and profile, detailed junction design, and typical cross section drawings. Alignments were optimized based on geometry, completion time, constructability, and cost. Automated design detailing helped to achieve the project goal.

Innovation in Roads

L&T-RAMBOLL Consulting Engineers Limited | Chennai, Tamil Nadu, India

Detailed Design of 30-kilometer Ring Road (NH 4)





The Highways and Minor Ports Department of the Government of Tamil Nadu, India, retained L&T-RAMBOLL Consulting Engineers Limited to design a cloverleaf interchange for the NH 4 ring road on the outskirts of Chennai. As part of a 30-kilometer greenfield corridor being constructed at a cost of USD 165 million, the intersection connects five major roads, which will decongest traffic and disperse urban growth.

L&T-RAMBOLL's scope of work included structural design of three major bridges, two minor bridges, and 100 culverts; 24 pedestrian underpasses; five vehicular underpasses; two roads over bridges; three flyovers; and three interchanges. Using MicroStation and Bentley MXROAD helped optimize the plan and profile to reduce project costs by 15 percent. Designing the cloverleaf interchange as a 3D model also enabled cost-saving automated grading.

McCormick Taylor | Chester, Virginia, United States

Route 10 Superstreet Design and Visualization





The Virginia Department of Transportation is building a USD 45 million "superstreet" in Chester, Virginia, to safely and efficiently manage congestion at the intersection of Route 10 and Chesterfield Road. The innovative design will eliminate left- and through-traffic movements on minor cross streets at the busy intersection. Cross-street motorists will instead make right turns, then U-turn to reach their destinations.

McCormick Taylor designed the project using Bentley Descartes, Bentley Map, GEOPAK Civil Engineering Suite, and InRoads Suite to create the base models. MicroStation and GEOPAK refined the design to accommodate the required turn lanes and ramps. Visual Solutions' VisSim ran traffic simulations to determine optimal turn lane lengths. A video featuring 3D animation helped win public support for the superstreet, which will be completed by June 2018.



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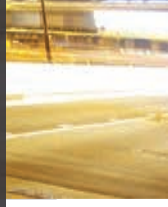
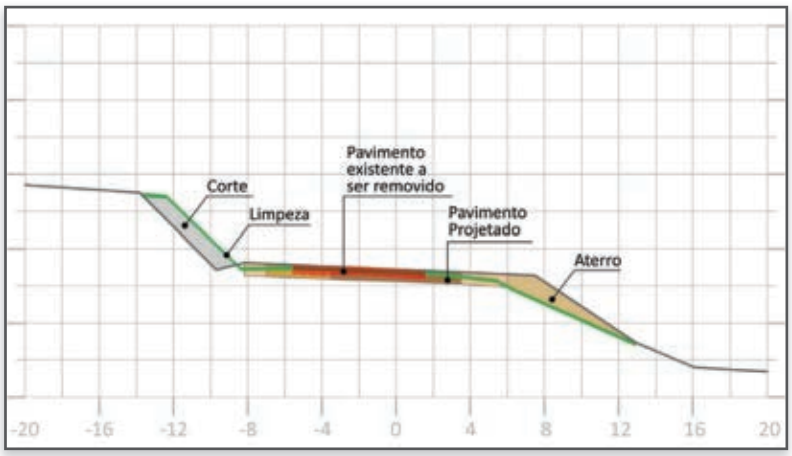
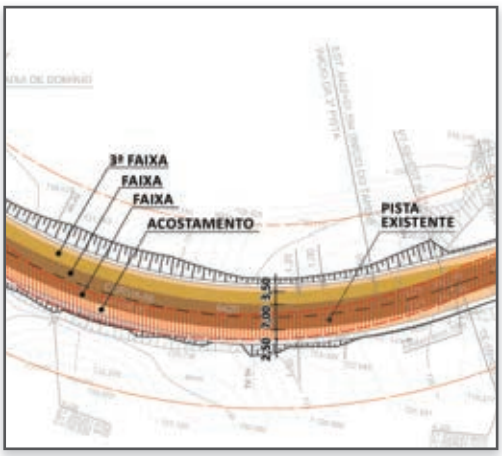


Planservi Engenharia Ltda. | Capão Bonito, Guapiara, Apiaí, and Ribeira, São Paulo, Brazil

Preparation for Lane and Paving Recovery on the Shoulders of SP-250





When restoration, installation, and widening projects overlap existing roadways, quantifying materials for pavement removal, cutting, and filling can be complex. The situation is further complicated when the designed and existing alignments are not parallel. To solve this problem, Planservi Engenharia developed a solution in PowerCivil for Brazil that quickly and accurately generates exact amounts of each material.

The BRL 5 million SP-250 highway restoration project in São Paulo, Brazil, demonstrated how the solution works. The project is over 130 kilometers, with slopes above 10 percent and a vertical drop of over 750 meters. PowerCivil for Brazil accurately prepared earthwork and pavement demolition quantities in half the time estimated for the work. The solution decreased the number of documents prepared by 60 percent and reduced project costs by 20 percent.

Ramboll and Parsons Brinckerhoff | London, United Kingdom

Structures and Tunnels Investment Portfolio





Transport for London's GBP 200 million Structures and Tunnels Investment Portfolio (STIP) will replace, strengthen, and refurbish key bridges, tunnels, and other structures throughout London. The first phase STIP comprises eight key structures, including the iconic Hammersmith Flyover and Grade II listed Chiswick Bridge. Staging the work and maintaining traffic mobility will be major challenges.

Ramboll and Parsons Brinckerhoff used Bentley's laser scanning tools to provide an accurate record of the existing structures. For defect mark-ups, Bentley Descartes was used to create as-existing record drawings from point-cloud data more quickly than a CAD application. ProjectWise was used to share up-to-date information among the geographically dispersed team members. The resulting high-degree of coordination and accuracy in 3D designs will reduce clashes, rework, and delivery costs during construction.

Innovation in Roads

SMEC Australia Pty Ltd | Gerringong, New South Wales, Australia

Princes Highway Gerringong Upgrade



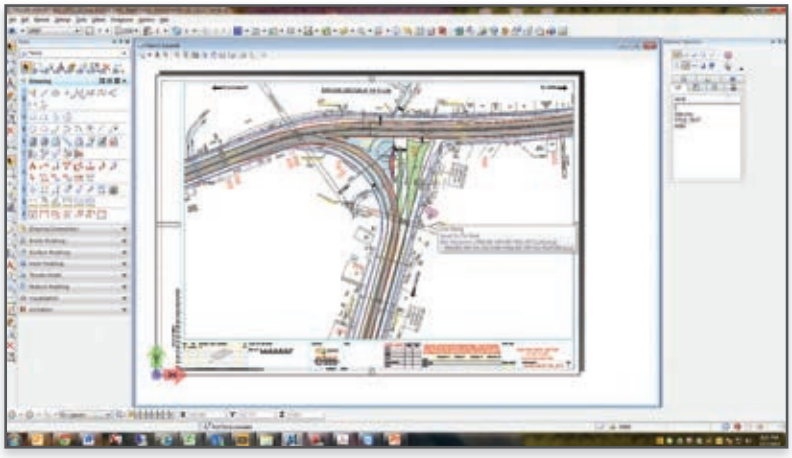


The Princes Highway, a major artery for southbound traffic leaving Sydney, Australia, needed major portions of the route upgraded to meet current design safety and traffic efficiency requirements. Roads and Maritime Services appointed Fulton Hogan Contractors and its principle designer, SMEC Australia, for the AUD 340 million project. The Gerringong Upgrade will provide approximately 7.5 kilometers of a four-lane highway.

Key considerations included traffic management and staging, flooding, cultural heritage and environmental issues, geotechnical treatments, and materials management. Bentley MXROAD created 3D models of the design and gINT managed the subsurface data that was crucial to determining how the design would proceed. Data from gINT is interoperable with Bentley MXROAD, which saved time and preserved data validity.

SMEC India Pvt Ltd | Jammu, India

Balance Work in Four-laning of Pathankot-Jammu and Jammu Bypass Section

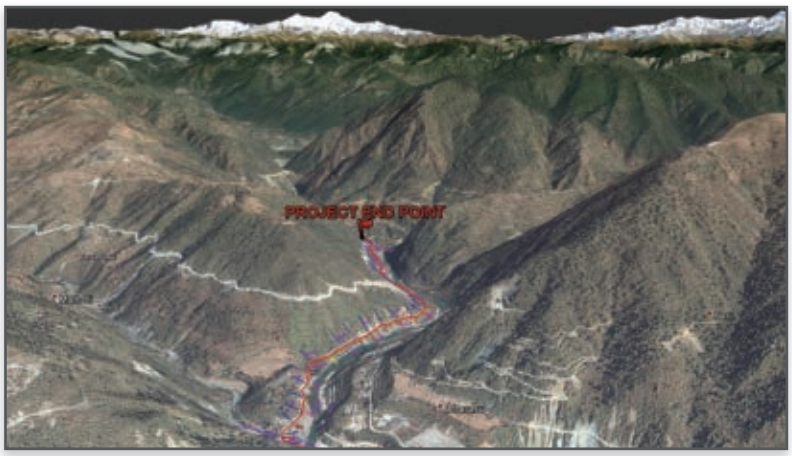


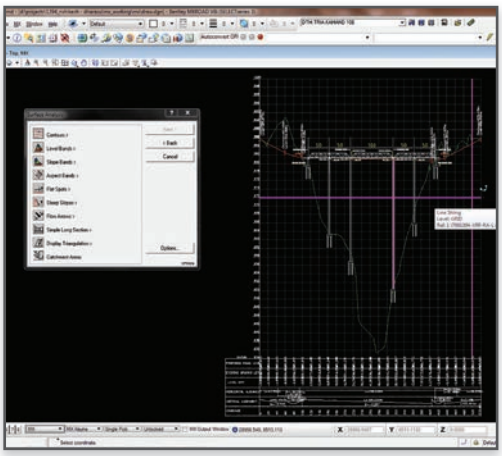


The National Highways Authority of India appointed SMEC India Pvt. Ltd. to produce a feasibility study and prepare a feasibility report for the four-laning of the Pathankot-Jammu section and Jammu bypass. This INR 1.25 billion project included the construction of two bridges, grade separators, pedestrian underpass, foot bridge, a road over bridge (rail crossing), and a road under a bridge.

The main challenge was striking a balance of design standards in transition sections. Using MicroStation and Bentley MXROAD, SMEC India submitted the first concept design five days before the stipulated deadline. The software helped the company save four days of design iterations when preparing various interchange options, which reduced project delivery costs by 10 percent. Design operation costs were reduced by 5 percent.

SMEC India Pvt Ltd and SMEC International Pty Ltd | Rishikesh, Uttarakhand, India
Two-laning of NH 94 Rishikesh-Dharasu



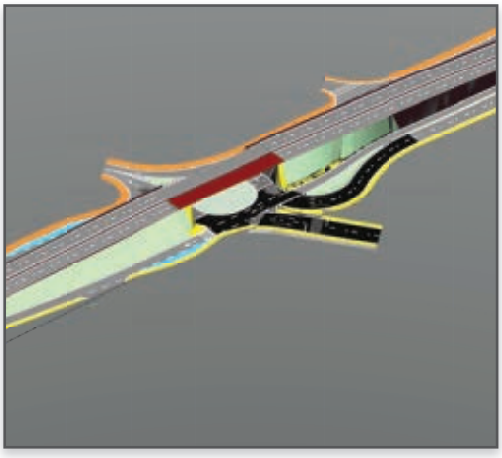


The Government of India's Ministry of Road Transport and Highways appointed SMEC India and SMEC International to prepare a detailed project report for the rehabilitation and upgrading of NH 94 to two lanes from Rishikesh to Dharasu. In addition to safety concerns, the INR 11 billion project also has significant religious value because it is a major connecting road for four pilgrimage routes.

The unique challenge for the project was the diversified geological strata along the highway. The latest satellite images and geological mapping technology were used to map the critical locations of the highway. The use of Bentley MXROAD reduced concept design delivery time by 25 percent, which resulted in project delivery six days early – enabling 10 percent direct and indirect cost savings.

SOTEPA Ltda | Içara, Santa Catarina, Brazil
SC 445 Highway Widening and Improvement





The State Department of Infrastructure of Santa Catarina, Brazil, retained SOTEPA Ltda to design a BRL 91.73 million widening and improvement project on an accident-prone segment of SC 445 Highway. The project will increase capacity and improve safety with a 22.8-meter-wide, 10-kilometer-long extension connecting BR 101 to Içara and Criciúma. The section incorporated 11 intersections in dense urban areas.

PowerCivil for Brazil provided the design tools needed to address challenges such as avoiding interferences with utilities, a high voltage line, and gas line. SOTEPA used 3D simulation and clash detection to specify where the roadway and drainage system designs had to accommodate the required clearances. Bentley products have helped SOTEPA's employees to be 30 to 100 percent more productive, and complete projects 25 percent faster.

Innovation in Roads

Walter P Moore | Houston, Texas, United States
Almeda Road Reconstruction

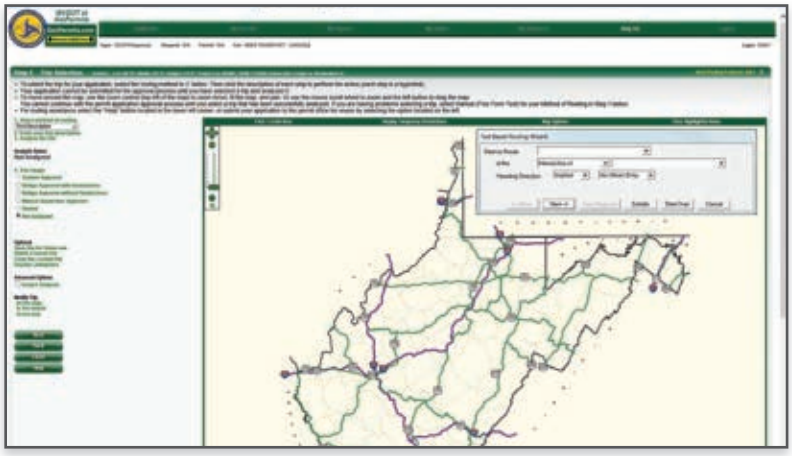


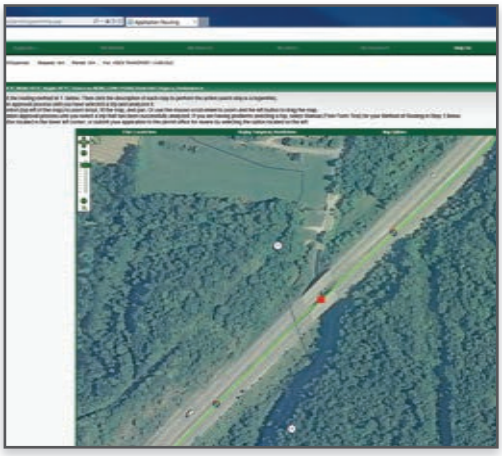


Located adjacent to Hermann Park and the Texas Medical Center in Houston, Texas, Almeda Road is a four-lane roadway with wide, grassy medians. This USD 9.6 million project reduced the median widths to City of Houston standards, reconstructed and widened pavement to accommodate six lanes of traffic, and provided continuous sidewalks on one side and a 10-foot bike lane on the other.

Because a significant portion of the project is located in a flood plain, balancing the cut-and-fill quantity was critical to project approvals. Using MicroStation and GEOPAK Civil Engineering Suite, the company balanced cut/fill with dynamic cross-sections to address regulatory compliance issues. Mobility in the rapidly expanding Texas Medical Center has been significantly improved while preserving and enhancing the environmental integrity of the area.

West Virginia Department of Transportation | Charleston, West Virginia, United States
Implementation of a Bentley-hosted SUPERLOAD System





The West Virginia Department of Transportation (WVDOT) originally implemented Bentley's SUPERLOAD system for intelligent permitting and routing of oversize/overweight (OS/OW) vehicles on its own IT infrastructure. This project upgraded the system and moved operations to Bentley-hosted infrastructure. It achieved three goals: 1) increase public safety by automatically checking OS/OW vehicle permits; 2) increase the permit issuance rate by ensuring accurate analysis; and 3) reduce overhead by deploying SUPERLOAD via Bentley MANAGEservices.

Bentley Professional Services helped configure and deploy the upgrade, and train WVDOT personnel. The straightforward interface promoted end-user adoption. More than 35,000 trucking companies now access the system. During the first year following the upgrade, SUPERLOAD issued 81.5 percent of all permits without staff assistance, compared to 24 percent previously.

Yenon-Research & Design Ltd. | Israel

Road 6 – Cross Israel Road





The goal of this ILS 800 million project was to coordinate all aspects of designing Road 6, also known as Cross Israel Road. Yenon-Research & Design was responsible for highway and corresponding interchanges, intersections, bridges, and tunnels. Yenon-Research & Design streamlined its work processes by performing 3D simulations and animations that ultimately created a unique 3D model with accurate coordinates.

The Cross Israel Road design was completed according to the Israeli and ASSHTO guidelines by using MicroStation, GEOPAK, and RM Bridge – software well-suited for projects of this scale. The software enabled Yenon-Research & Design to deploy a system design approach, which integrated all elements of design and planning supervision and quality control to produce the best possible and most innovative result.









"Bentley software solutions facilitate data processing and streamline project production, meeting the needs of our customers who demand the answers in increasingly short deadlines."

– Eduardo Minoru Nagao, Director of Infrastructure and Construction, Engevix Engenharia S.A.



Innovation in Structural Engineering

The projects in this award category have demonstrated excellence in analyzing, designing, or delivering one or more structures. These projects illustrate how the use of technical innovation can provide high-quality structures or improved structural project workflows that enhance the structure's functional performance, delivery process, or quality of service.

Innovation in Structural Engineering

WINNER

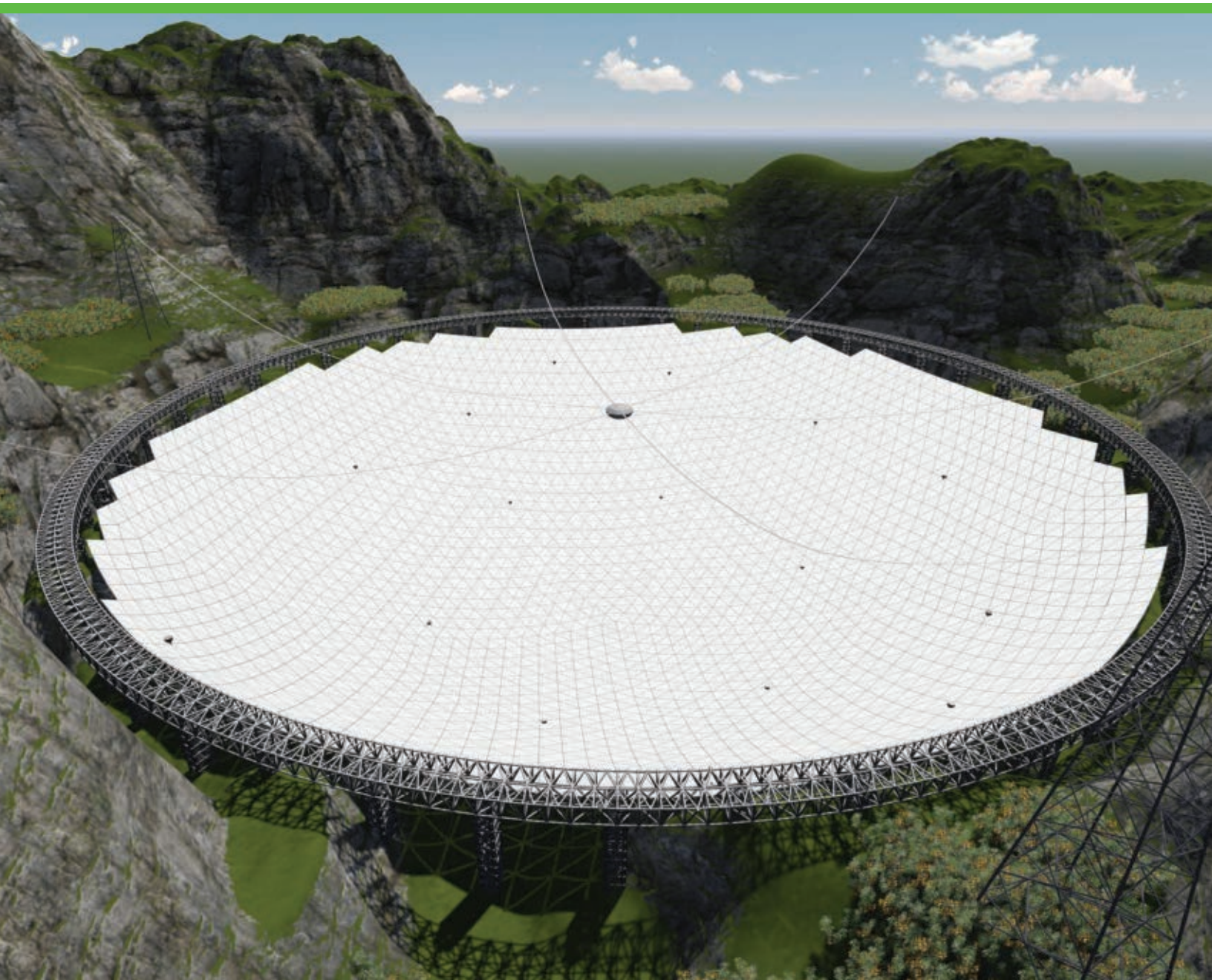
Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences

Karst, Guizhou, China | **Five-hundred-meter Aperture Spherical Radio Telescope**

One of the top nine science and technology infrastructures in China, the Five-hundred-meter Aperture Spherical Radio Telescope will be the largest single-aperture telescope on Earth. Its antenna aperture is 500 meters, which is as large as 30 standard football fields. Its cable net structure consists of 6,670 main cables and 2,225 downhaul cables, and the weight of the cable wheel alone is 216 tons. The reflector consists of 4,600 reflector units installed on the cable net.

From site selection and design to construction, the Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences, deployed BIM technology in the form of AECOsim Building Designer, MicroStation, Bentley Navigator, ProjectWise, and ProSteel. With ProSteel's BIM capabilities, including parameterization, the teams designed and optimized the 445 network cable nodes, cutting the cost by CNY 4 million.

Special Recognition Award Winner Advancing Dimensions in Infrastructure





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FINALIST

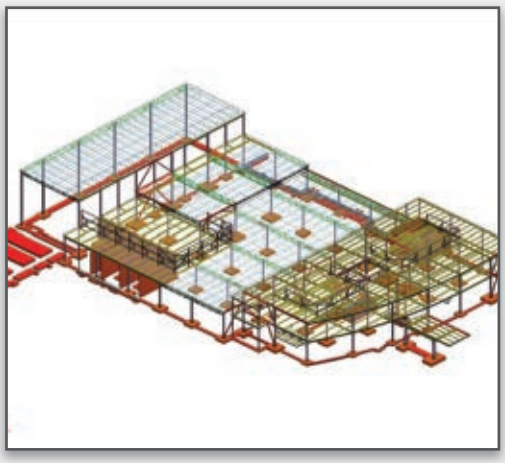
D&H Steel Construction | Waitakere, Auckland, New Zealand

Westgate Footbridge

The Westgate Footbridge in Auckland, New Zealand, links the community facilities of a shopping center, local library, and sports complex, which had been cut off from each other by highway expansion. The challenge of this NZD 5 million project was to design the approach ramp as a double spiral – with both left-handed and right-handed spirals – while minimizing its environmental impact on the local creek that it followed.

D&H Steel Construction used ProSteel to create the bridge model, which served as the base from which it modeled, detailed, and fabricated a series of jigs that were then used to form the spirals and ensure the ends of the truss sections were accurate. The ProSteel model became the primary source of accurate information and allowed D&H Steel Construction to coordinate the precast concrete, foundations, handrails, throw screens, and pedestrian lighting.





FINALIST

Fitzpatrick Engineering Group | Charlotte, North Carolina, United States

Octapharma Blood Plasma Facility

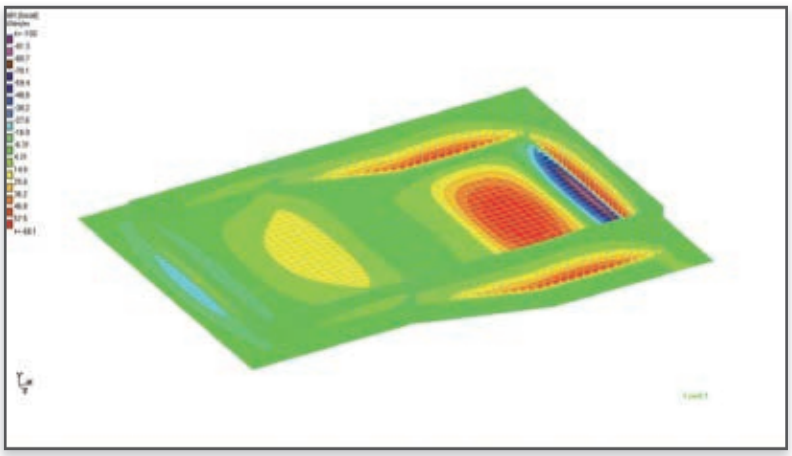
Octapharma's life-saving human plasma products help with intensive care, emergency medicine, and many chronic diseases. The main goal of this USD 26 million project in Charlotte, North Carolina, was to replace outsourced testing operations and expand internal warehouse and processing capabilities, which would save Octapharma USD 1 million per month. With this amount of money on the line, a traditional design-bid-build process would have cost three to four months on the schedule and millions of dollars.

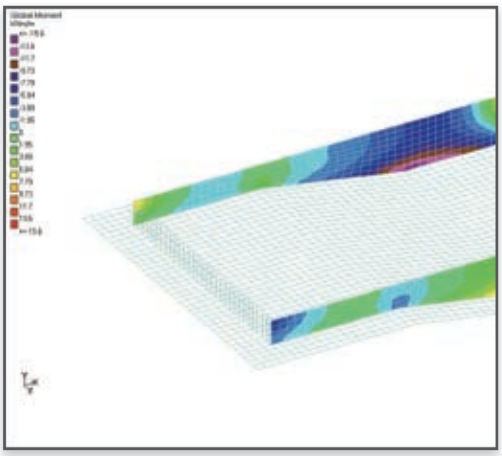
Because the project was so unique, the design was constantly changing. The ability to share BIM model data multiple times during the design phases was key to meeting the schedule. Using AECOsim Building Designer, Fitzpatrick Engineering Group could easily share accurate data with the detailer and virtually eliminate data re-creation. This shortened the construction schedule by eight weeks on this project, saving the owner USD 2 million.

Innovation in Structural Engineering

ADG (D&C) | Pune, Maharashtra, India

Swimming Pool at Pune



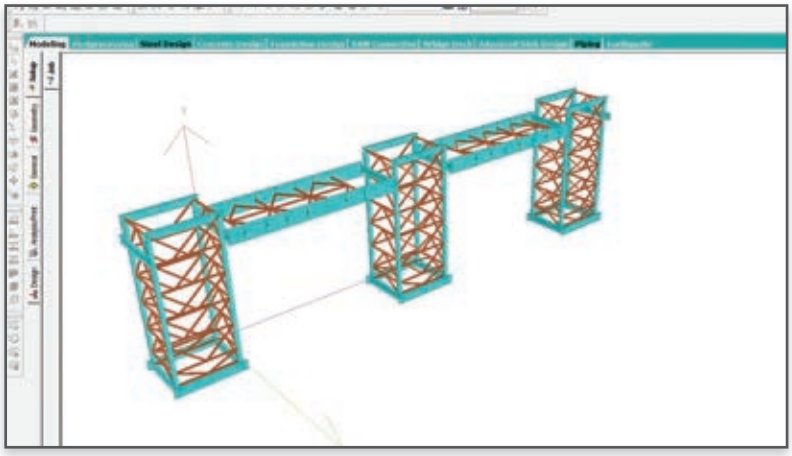


Located in Pune, India, this INR 20 million project by ADG encompassed the design of a 15-meter-by-25-meter pool with depths that varied from 1.5 meters at one end to 3 meters at the other. Since the water table at the site rises to ground level, the pool had to be designed for varying levels of the water table. The design team needed to model and analyze the pool structure in both conditions to ensure that it could safely withstand the stress variances.

Due to plate element and detailed analysis available with STAAD.Pro, the project could be analyzed in detail – leading to a 45 percent cost savings compared to the traditional method of analysis based on a two-way slab analysis approach. STAAD.Pro post-processing also helped ADG interpret the stresses of quadratic elements whose local axes were not aligned with the global axes.

Afcons Infrastructure Limited | New Delhi, Delhi, India

Barapulla Elevated Corridor Phase I and II





The Barapulla elevated corridor project is one of the esteemed infrastructure projects for citizens of New Delhi, India. In such an old and congested city, the elevated corridor provides connectivity between the central area of the city and to areas to the west. The alignment passes through congested areas and has steep gradients, super-elevations, and curvatures. The project implementation was required to be conducted without affecting the existing traffic.

Since the feeding of segments and other equipment from the casting yard to the work site was allowed only during limited night hours, an innovative ground-supported, bridge launching system was planned and designed for this INR 3.4 billion project using STAAD.Pro. The analysis, design, and detailing proved to be extremely satisfactory. The software enabled greater ease in optimization of certain member forces and sizes.



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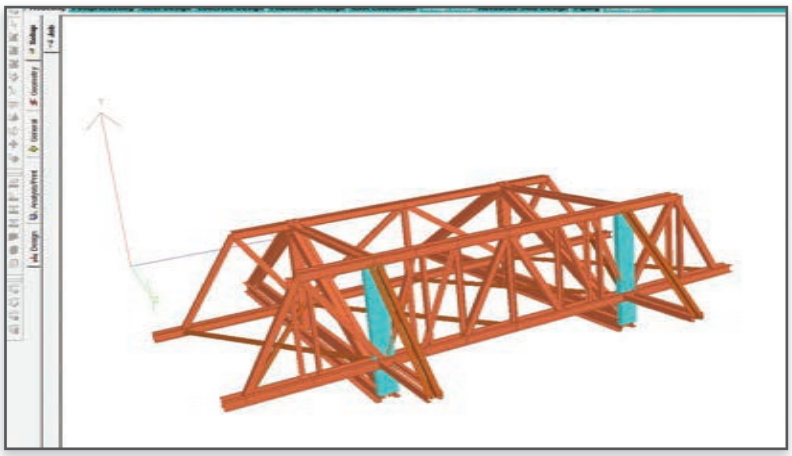
Afcons Infrastructure Limited | New Delhi, Delhi, India

Cantilever Form Traveler



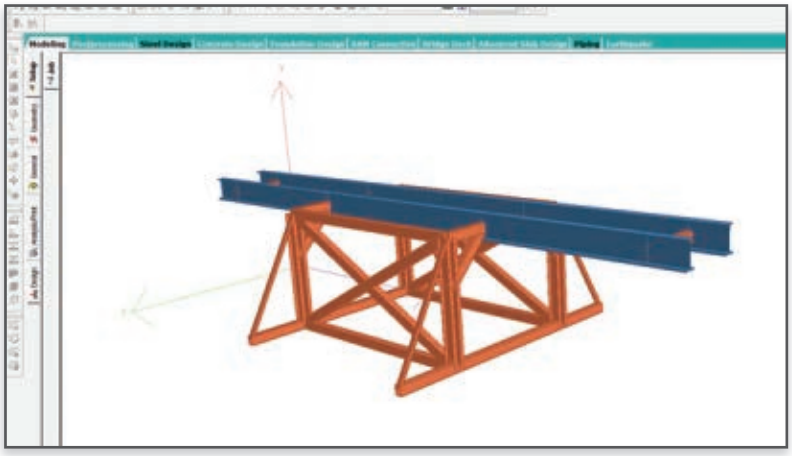


For the Barapulla Elevated Corridor Phase-II project under way in New Delhi, India, three balanced cantilever spans were constructed. One span was above an existing road, and two spans were over a railway line near a fruit market. The balance cantilever span near the Sarai Kale Khan area was constructed using a cantilever form traveler without affecting the traffic movement below the bridge construction.

Afcons Infrastructure used STAAD.Pro for the analysis, design, and detailing of various members of the cantilever form traveler, rather than perform these functions manually as was the typical method. Because the software is so user friendly, the team was able to easily model, modify, and optimize with minimum effort. This INR 3.4 billion project demonstrated a unique use of STAAD.Pro compared to more conventional applications.

Afcons Infrastructure Limited | Kolkata, India

Erection Gantry for Precast Crash Barriers





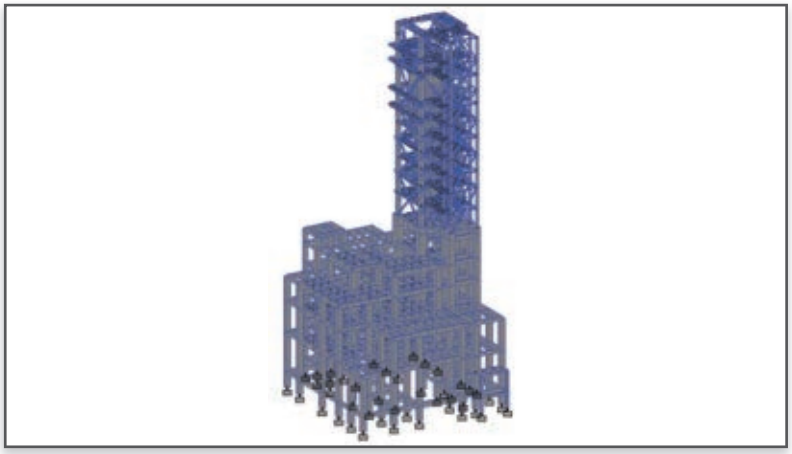
Afcons Infrastructure constructed two elevated metro rail lines, each approximately 5.7 kilometers long, that connect with the older underground metro for Rail Vikas Nigam. The superstructure in Kolkata, India, consisted of segmental box girders. After the segmental spans were complete, the precast crash barriers were installed on the completed spans. A traveling steel gantry was used for installation of the precast-crash barrier panels.

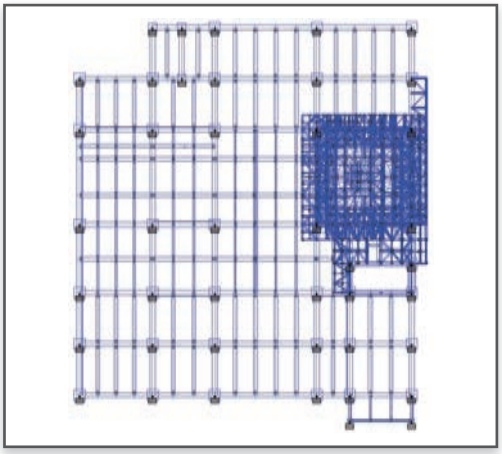
Because time had been lost on bridge alignment work as the rail passed through other properties on this INR 8 billion project, Afcons Infrastructure needed to expedite the crash-barrier installation. STAAD.Pro was used for analysis, design, and detailing of various members of the traveling gantry, and the deflection estimated at various nodes exactly matched the actual fabricated unit when load tested prior to final placement.

Innovation in Structural Engineering

Aker Powergas Pvt Ltd | India

Process Structure for a Petrochemical Plant





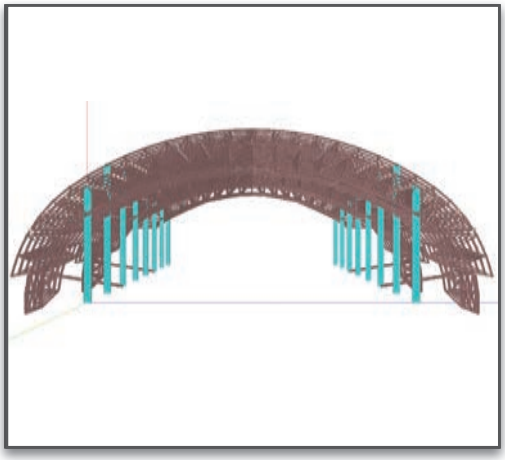
For this process structure at a petrochemical facility in India, the main challenge was the excessive deflection of the vessel under design wind-loading conditions causing huge stresses to the attached critical piping. Whenever there was deflection in the vessel, the structure needed to restrain the deflection after the notional gap deflection. Modeling of the vessel and structure interface was complex due to this unique requirement.

Aker Powergas used STAAD.Pro to carry out various analysis and design requirements. PDS software was used for the 3D modeling, and MicroStation provided the 2D interface to the PDS system, which made the interface simple and avoided mismatch errors between the 3D models and 2D models. All the interface requirements were addressed and construction drawings were issued only after the interface clashes were resolved and the structure was clash free.

Aster Building Solutions Pvt Ltd | Navi Mumbai, Maharashtra, India

Navi Mumbai Metro Rail Station





Traffic congestion and air pollution are majors concerns for Navi Mumbai, India, and this state-of-the-art metro rail station constructed for CIDCO by Aster Building solutions helping to reduce both. A major goal of this 12.5 million project was to design and optimize the quantities of material required. The curved frame had an 11-meter cantilever on both sides, which added complexity to the design.

Aster Building Solutions used STAAD.Pro to get the best possible design within a short period of time. The schematic geometry was completed in AutoCAD and exported into STAAD.Pro for the analysis and design. STAAD.Pro reduced the complex space frame analysis time for dynamic loading, which translated into overall operational cost reductions. STAAD.Pro's built-in design standards also helped the team ensure a safe and sustainable design.



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Bos Constructie V.O.F. | Liempde, Noord-Brabant, Netherlands
Steel Construction for Bouwservice Liempde Building





For this project located in an industrial park in Liempde, Netherlands, Bos Constructie designed and constructed the steel elements of a new building owned by Bouwservice Liempde. The main challenge was the canopy located on the backside of the building. Although it was important that the load balance on the different parts of the steel construction be accurate, it was even more so when an element was outside of the main construction.

Bos Constructie used ProSteel for this EUR 100,000 project, primarily due to its ability to integrate other vendors' software such as AutoCAD. The information written in the models continued to be visible in AutoCAD when integrating the ProSteel design. With ProSteel, accurate calculations were assured. Since the 3D models did not need to be changed later due to errors introduced into the process, the software paid for itself within a year.

Byggnadstekniska Byrån i Stockholm AB | Stockholm, Sweden
Fondbyggnad Hornstull





With a broad background in new construction as well as building renovation and expansion, Byggnadstekniska Byrån i Stockholm was contracted by Bonnier Fastigheter to take responsibility for all phases of building construction for this new square in the Hornstull area of Stockholm, Sweden. The company leveraged its expertise in building construction and structural, foundation, and geotechnical engineering.

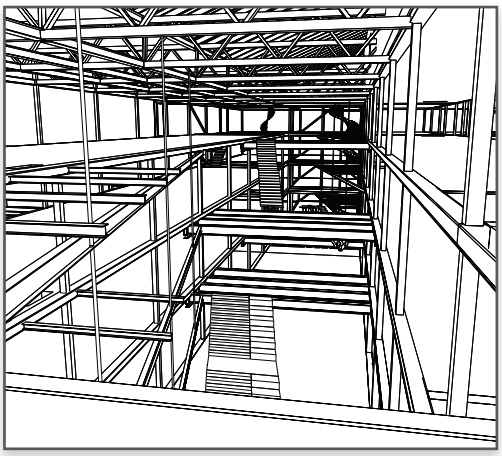
This project was technically challenging because of its complex geometries. Byggnadstekniska Byrån i Stockholm used the latest technologies including AECOsim Building Designer, MicroStation, and ProSteel. The 3D models reduced design time, eliminated costly errors, minimized risk, and promoted a better understanding of the complicated project across a wide range of stakeholders.

Innovation in Structural Engineering

Byggnadstekniska Byrån i Stockholm AB | Stockholm, Sweden

Medicinaren 23, TFH Byggnad 1





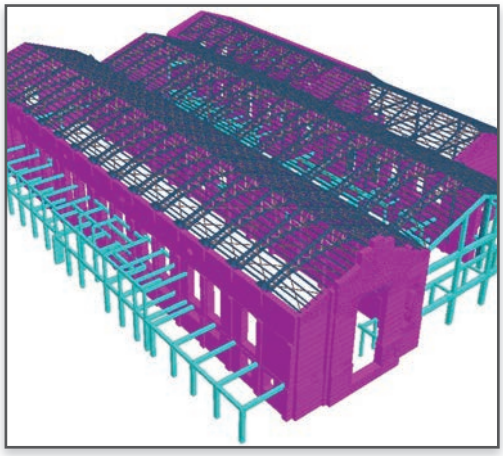
Byggnadstekniska Byrån i Stockholm constructed this SEK 317 million structure in Stockholm, Sweden, for TKV Fastighets. One of the main challenges was not to exceed the load-bearing capacity of the structure. This was accomplished by using trusses to move the loads from the weaker areas to the stronger areas of the existing structure. Another challenge was to design the long stairs that connect to the bridges in the atrium with no disturbing vibrations.

Byggnadstekniska Byrån i Stockholm used AECOsim Building Designer, MicroStation, and Bentley Navigator to create the steel framework, hollow core slabs, stairs, and bridges with very high eigenfrequencies. AECOsim Building Designer's user-friendly 3D modeling reduced both the time and cost of project delivery. In addition, the 3D modeling increased project collaboration and minimized collision risks.

C. Maraveas Partnership | Athens, Greece

Assessment and Rehabilitation of the First Greek Power Plant



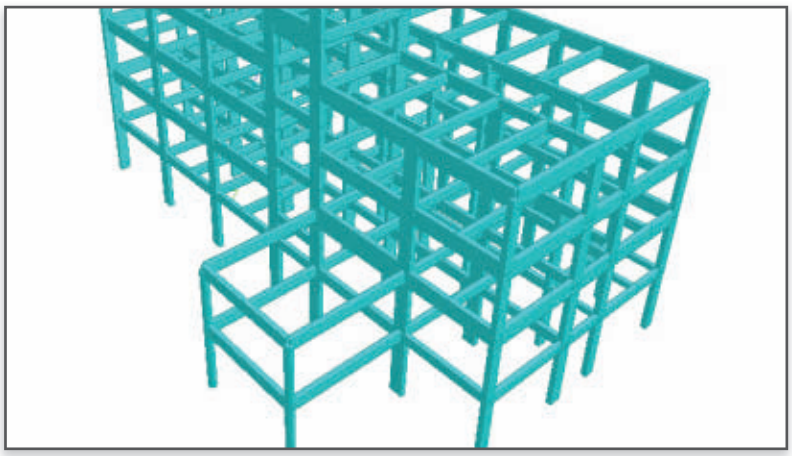


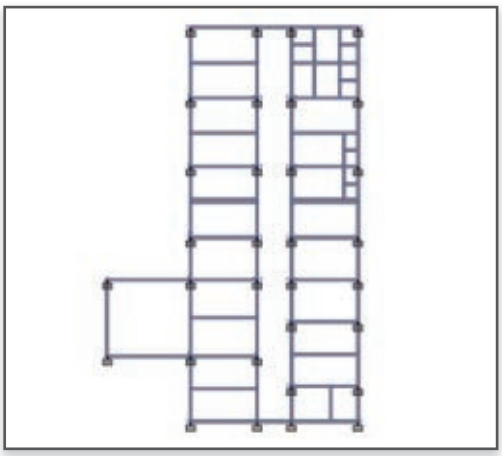
This EUR 8 million project encompassed the structural assessment and retrofit of the first electric power station in Athens, Greece, for the Greek Electric Power Corporation. Registered as an industrial heritage monument, the building's architectural, historic, and technological value was significant. The main challenge was to design an unconventional structure comprising different materials and simulate it using different types of finite elements (plate and beam).

C. Maraveas Partnership used STAAD.Pro to model the structure in 3D, using plate finite elements for the masonry and beam elements (of different materials) for the roof and mezzanine. Traditional modeling for the masonry would have increased the pre- and post-processing time by 70 percent. It also would have increased the cost by 40 percent due to the unavoidable implementation of more conservative assumptions in favor of safety.

CIDCO | Navi Mumbai, Maharashtra, India

Kamothe Police Station



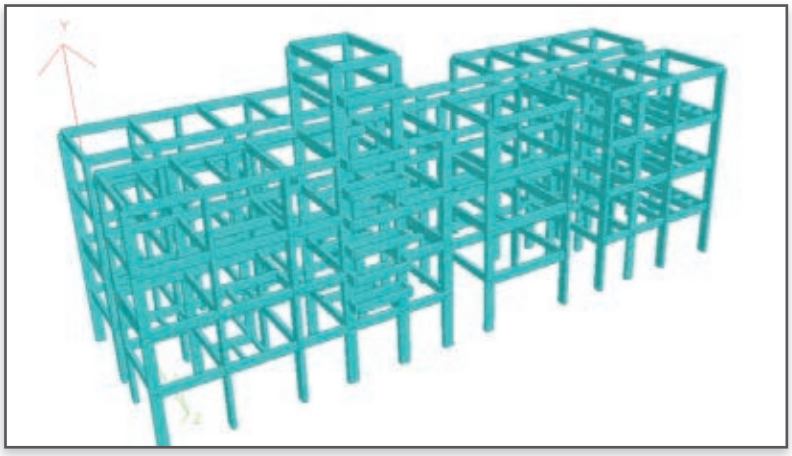


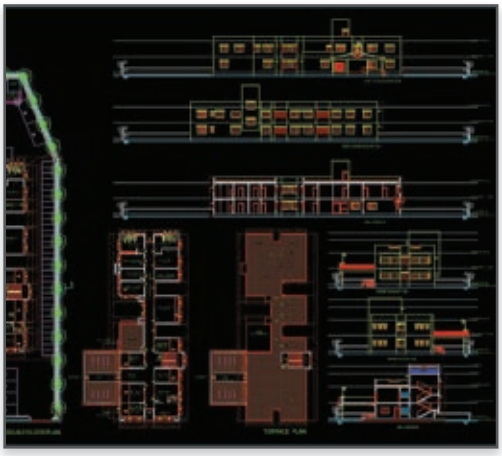
The goal of this INR 25 million project was to construct a new police station in Navi Mumbai, India. The public-utility project was needed to upgrade and maintain safety in the Kamothe community. The main challenge was delivering the project within time constraints while ensuring that quality remained high.

CIDCO standardized on STAAD for the structural analysis and design of every element of the police station. The standard technology platform enabled a variety of software to be used on the project (STAAD, AutoCAD, and Microsoft Office), which resulted in reduced design time due to interchangeable data and automatically generated iterations.

CIDCO | Navi Mumbai, Maharashtra, India

Kharghar Police Station



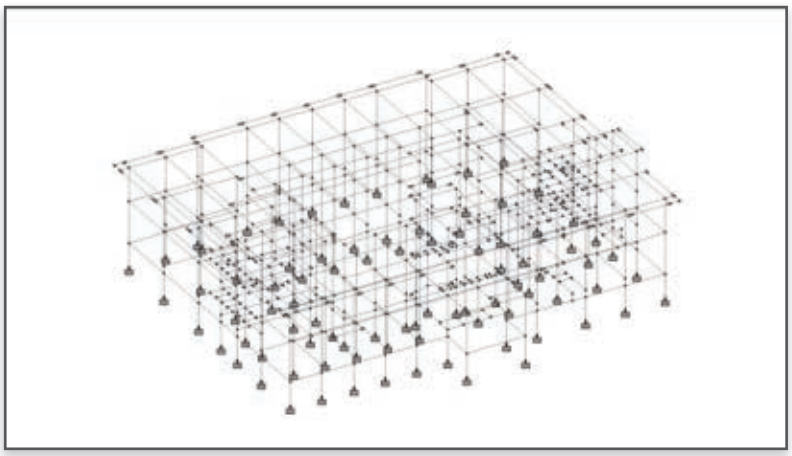


For this INR 25 million project, CIDCO was tasked with designing a police station in Navi Mumbai, India. The new building was critical to maintaining law and order in the Kharghar area. The use of STAAD for design drawing generation helped the CIDCO team standardize on one technology platform, which saved time in the long run as structural design and drawing became faster and easier.

CIDCO used STAAD for structural analysis and design of every element of the police station. The design team used AutoCAD software for devising the plan and calculating the elevation and sections in the architectural and structural drawings. Excel spreadsheets also played a role in the design of the foundation. The interoperable software reduced design time and streamlined regulatory compliance issues.

Innovation in Structural Engineering

CIDCO | Navi Mumbai, Maharashtra, India
School Building for Raigad Zilla Parishad



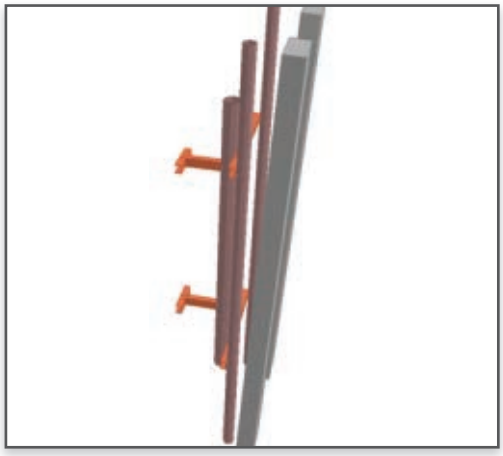


The INR 2.43 million school building was a public-utility project that would revitalize a Navi Mumbai, India, community. CIDCO's goal was to use the latest technology to not only reduce environmental hazards in the construction phase, but also to reduce the overall impact on the ecosystem anywhere in the school's vicinity. Adhering to a tight schedule while maintaining quality was critical.

CIDCO used STAAD products for the structural analysis and design of every element of the school structure. By deploying a platform that enabled the integration of a range of software (STAAD, AutoCAD, and Microsoft Office), CIDCO significantly reduced the design time of the project. Manual iterations during the feasibility stage alone would have caused delays.

Jarlsø Telecom Solution Norway AS | Maputo, Mozambique
Telecommunication Towers





Plessey International retained Jarlsø Telecom Solution Norway to design and manufacture three-legged lattice, self-supporting telecom towers in Maputo, Mozambique. The USD 1.5 million project required the 26- to 50-meter-tall towers to be constructed in as little time and with as small a footprint as possible. Information mobility was critical to assure flexibility on the input side and freely manageable information on the output side.

Jarlsø Telecom Solution Norway's use of STAAD.Pro and STAAD.Foundation reduced project delivery time by enabling efficient engineering and improving production time. The rapid finite element analysis provided the opportunity for fast response time to technical challenges. Since the current data and models can be reused later, any future upgrade on the structures can be handled easily, reducing engineering hours and increasing efficiency.



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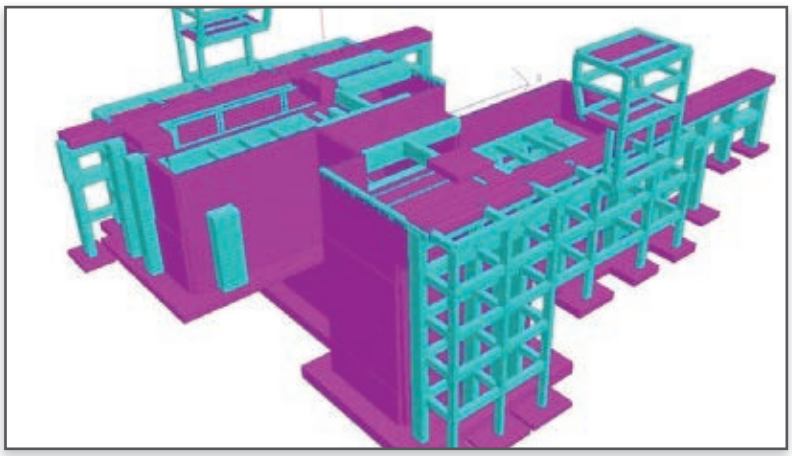
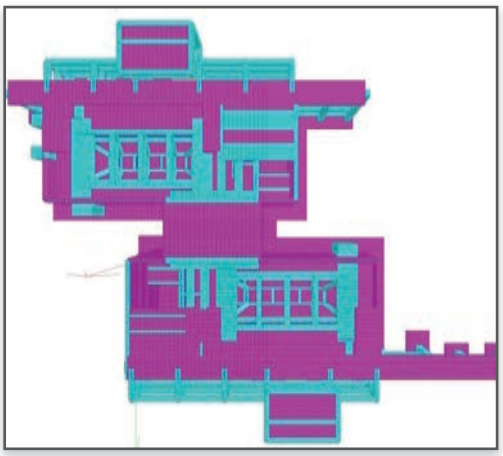
Lalitpur Power Generation Company Limited | Lalitpur, Uttar Pradesh, India

3x660 MW Lalitpur Super-thermal Power Project Coal-handling Package



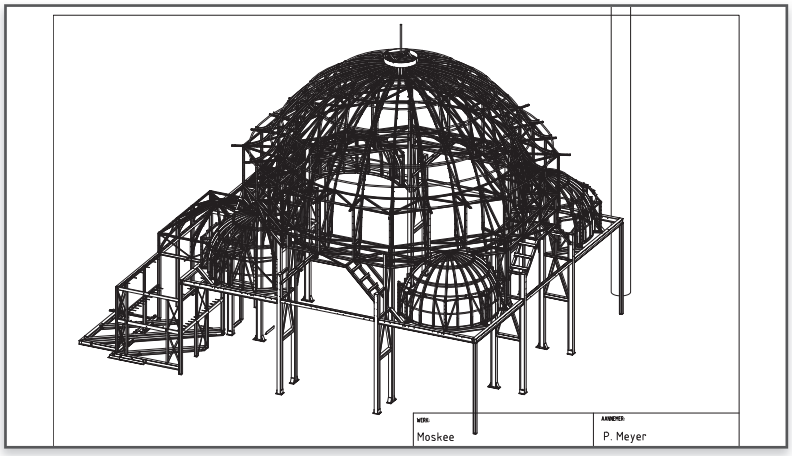


The demand for electricity in India has been steadily increasing due to rapid industrialization and large-scale use of electricity for irrigation, domestic, and commercial purposes. When this INR 3.95 billion project is complete, the Lalitpur super-thermal power plant will provide 3x660 megawatts of power to the national power grid in India. The challenge of this project was how to fast-track the project using innovative technology.

The project encompassed the installation of the complete coal-handling system along with associated auxiliaries, including the complete civil works for the power plant. Lalitpur Power Generation Company Limited (LPGCL) used STAAD.Pro to optimize and submit the design on schedule. STAAD.Pro enabled LPGCL to test different alternatives to achieve the best model, which consisted of 23,000 plate elements and 2,600 line elements.

Siem Steur Staalconstructies B.V. | Amsterdam, Netherlands

Westermoskee





The goal of this EUR 7 million project in Amsterdam, Netherlands, was to construct a mosque for the Turkish community made of 200 tons of steel and featuring 24 trusses. For the cover of the dome, Siem Steur Staalconstructies rolled and anodized the aluminum tubes for manufacturing. For successful installation, it was critical that the detailed calculations, production, conservation, and assembly were accurate.

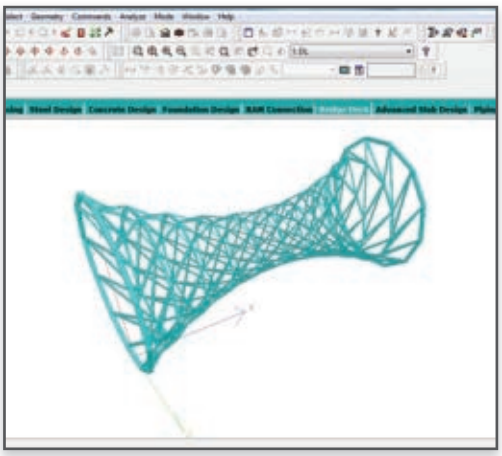
Siem Steur Staalconstructies used ProSteel to design the structure and model the trusses situated on a steel ring. A particular challenge was the dome, a design in which everything needed to be perfectly round, both vertically and horizontally. ProSteel's ability to provide automatic creation of documentation and details resulted in the rafters all coming together in the steel ring at the top as conceived by the designers.

Innovation in Structural Engineering

Tata Steel Growth Shop | Kalinganagar, Odisha, India

The Rath



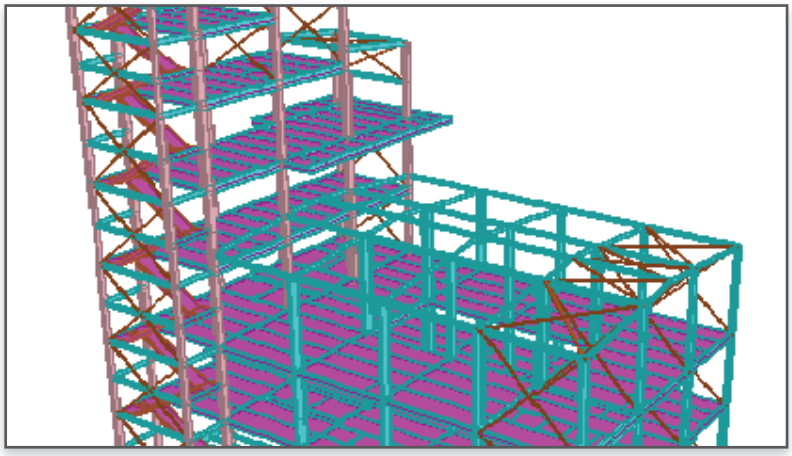


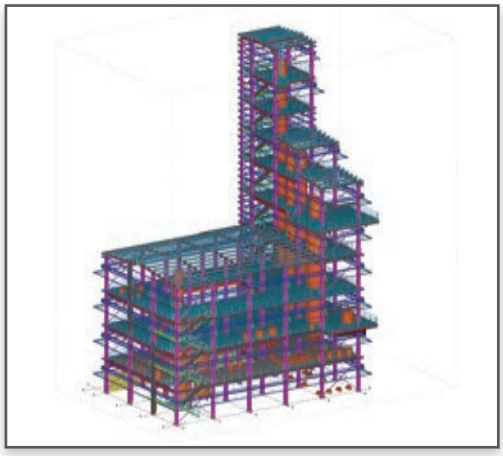
Tata Steel Growth Shop, a division of Tata Steel, is one of the largest designers and manufacturers of plants in India. It maintains a massive, state-of-the-art manufacturing unit accredited with ISO 9001 and ISO 14001 certifications. With a quintessential architecture deriving its form from the perennial motion of wheels, this INR 1.8 million project in Kalinganagar, India, validates the shop's position in the innovative design and fabrication sector.

The unique engineering challenges of this particular project included the joint connections at the intersection points of the polygon frames and the extremely challenging fabrication of the geometrical framework. Tata Steel Growth Shop used STAAD.Pro, which has become the technology backbone for innovative and futuristic design philosophies on a global platform.

Wipro Enterprises | Haridwar, Uttarakhand, India

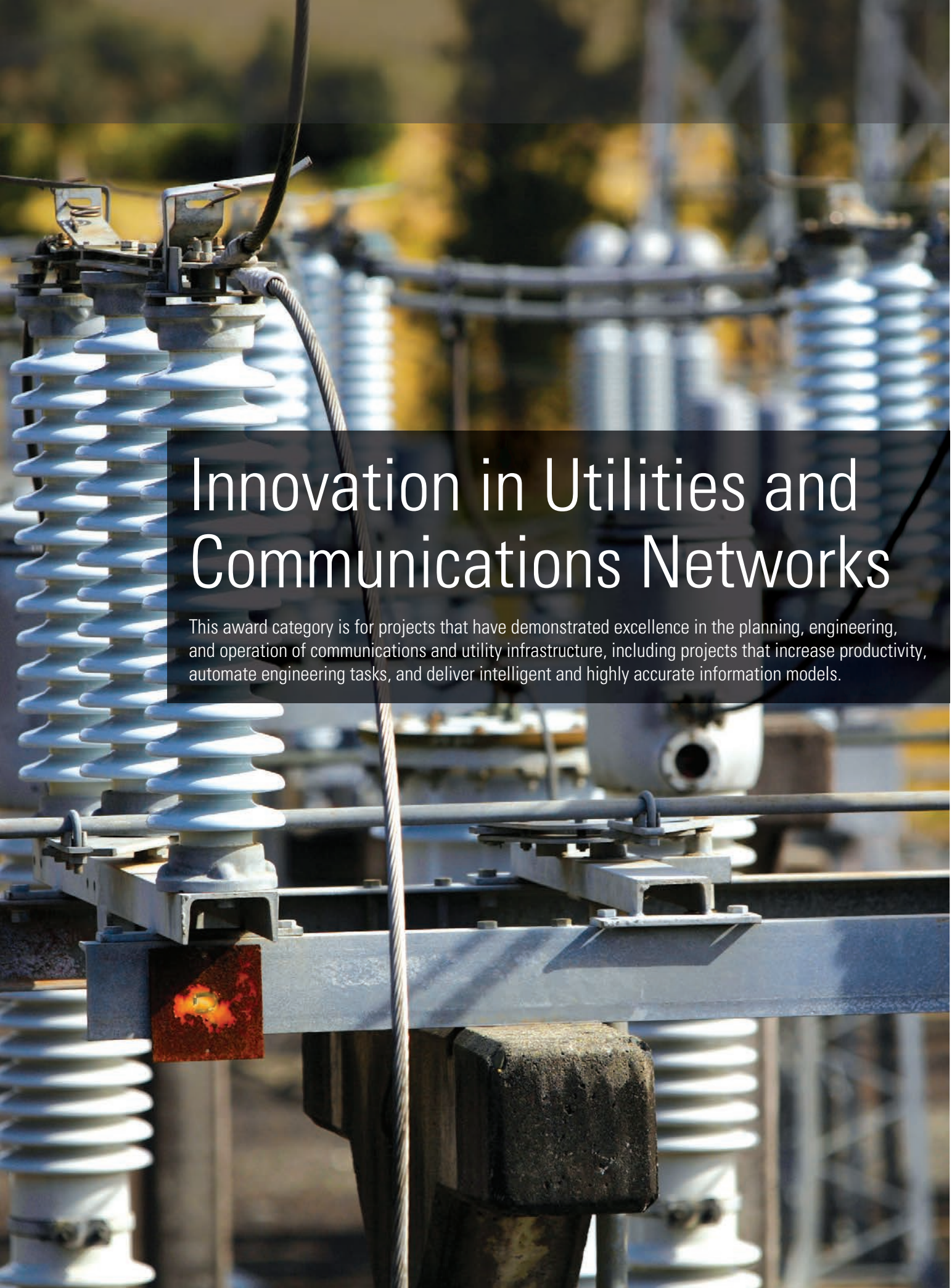
Wipro Fatty Acid Plant





Pre-engineered buildings typically are prefabricated and assembled on site, resulting in significantly reduced construction/erection time and costs. The challenge for this INR 80 million project – a fatty acid plant in Haridwar, India – was to design, fabricate, and erect a complex 48-meter-high structure with such efficient use of resources that the company clearly demonstrated an edge over other pre-engineered building competitors.

Wipro Enterprises used STAAD.Pro to model a structure that would be one of the tallest steel structures in northern India. Because the design was vetted within STAAD.Pro itself, the company began fabrication and erection sooner. By providing four-node plates in STAAD.Pro, diaphragm action of the RCC slab could be considered, resulting in lighter-weight steel joists. Wipro Enterprises was able to use 10 percent less steel as a result of using STAAD.Pro.



Innovation in Utilities and Communications Networks

This award category is for projects that have demonstrated excellence in the planning, engineering, and operation of communications and utility infrastructure, including projects that increase productivity, automate engineering tasks, and deliver intelligent and highly accurate information models.

Innovation in Utilities and Communications Networks

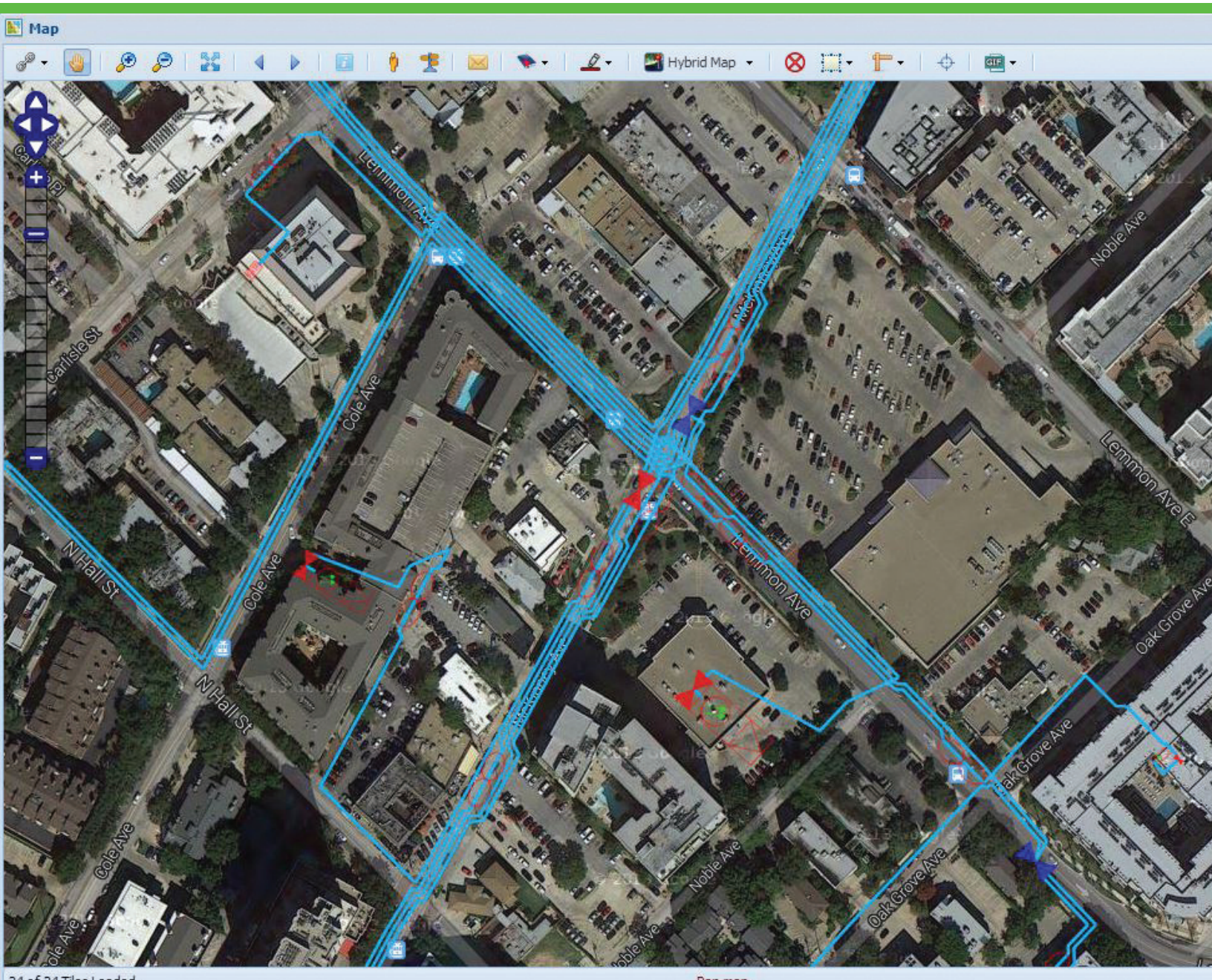
WINNER

Time Warner Cable | Centennial, Colorado, United States

An Enterprise GIS Strategy for Increased Revenue and Lower Costs Using Bentley's Communications Solution

Time Warner Cable deployed the Bentley Communications solution across its extensive operations as a common design engineering platform. The company designed an enterprise-class environment that users access via terminal services at any one of six regional design centers. Having a common platform allowed Time Warner Cable to standardize processes and practices for design, end user training, IT administration, and ongoing field operations. The asset data about its nation-wide communications network that is created and updated through the daily use of the system is rolled up to a centralized geographic information system that acts as the system of record for the entire enterprise.

With access to accurate information about existing network assets and enhanced engineering capabilities, Time Warner Cable has reduced the cost of project delivery for new network infrastructure projects. The new environment provides an accurate view of all network assets, allowing for faster pinpointing of outages and faster plant location and helping the company avoid unnecessary truck rolls. Time Warner Cable realized a first-year ROI of 40 percent. Cumulative savings projected over three years are 121 percent, with ROI doubling after five years.





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FINALIST

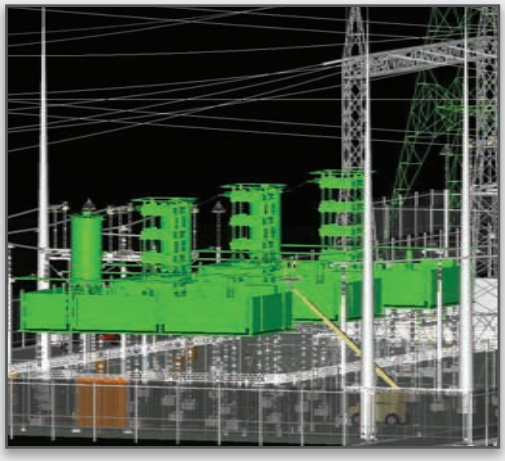
Southwest Electric Power Design Institute | China

Zhaotong Converter Station

Southwest Electric Power Design Institute constructed the Zhaotong Converter Station as part of China's West-East Power Transmission initiative, which will enhance regional power transmission and meet the power grid load for Guangdong Province. The station receives DC transmission power of 2x3200 megawatts from Xiluodu Right Bank Power Plant and transmits ±500 kilovolts via double circuit HVDC to the Guangdong grid.

Bentley products solved numerous engineering challenges, including earthwork (GEOPAK), structural analysis (STAAD.Pro), integrated substation design (Bentley Substation), refined cabling (Bentley Raceway and Cable Management), clash detection/resolution (Bentley Navigator), and collaborative design (ProjectWise). With Bentley software the Design Institute completed the project three months in advance, cut project delivery costs by 8 percent, reduced operating costs by 10 percent, and increased the rate of return on investment by 5 percent.





FINALIST

ElectraNet | Adelaide, South Australia, Australia

Bentley Substation Implementation and Integration into ElectraNet SOP

As the principal Transmission Network Services Provider in South Australia, ElectraNet owns and manages the state's high-voltage electricity transmission network and operates in the National Electricity Market. ElectraNet embedded Bentley Substation into its standard suite of design software with the goals of achieving accurate preliminary project costs, accelerating the approval process, and bringing 3D modeling in-house.

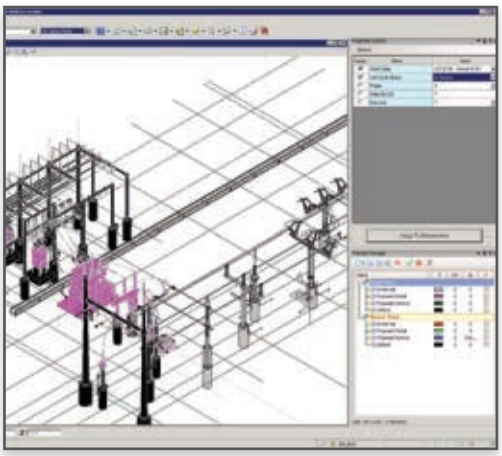
Initial deployment on three major projects ranging from AUD 18 million to AUD 90 million demonstrated that Bentley software saved time and money. Bentley Substation allowed ElectraNet to develop a library of standardized 3D models, which improved accuracy, turnaround time, and information sharing. Each project saved AUD 20,000 in direct costs from external contractors, plus one month less time was spent on each project quality checking the 3D models.

Innovation in Utilities and Communications Networks

American Electric Power | Gahanna, Ohio, and Tulsa, Oklahoma, United States

Bentley Substation and eB Implementation





American Electric Power's substation design offices had diverged in their use of various processes, tools, and procedures. Information required for design was spread across multiple systems. This project provided an end-to-end integrated substation design process with supporting tools and automation, all while retaining out-of-the-box functionality and using configuration instead of customization.

By taking advantage of Bentley Substation's integrated set of capabilities combining intuitive 3D modeling, electrical design functionality, and automatic bills of materials and report generation, American Electric Power anticipates faster design cycles and improved collaboration across physical and electrical design disciplines. American Electric Power is also implementing Bentley's AssetWise capabilities to integrate Bentley Substation with existing systems that house data integral to the design processes.

Special Recognition Award Winner Advancing Asset Lifecycle Information Management

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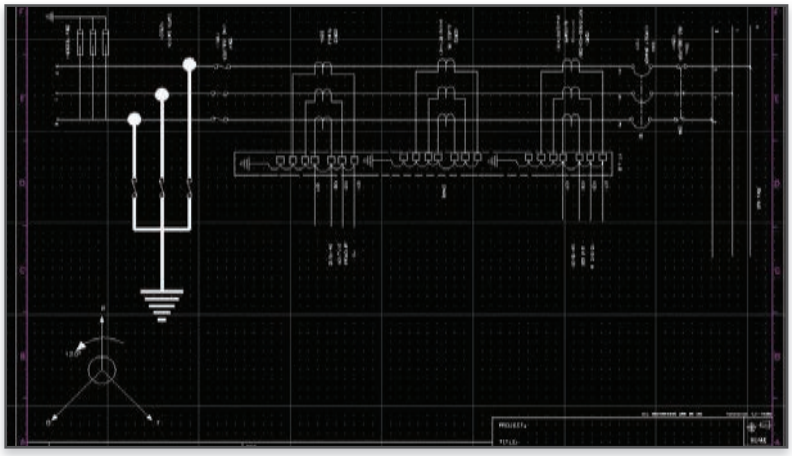
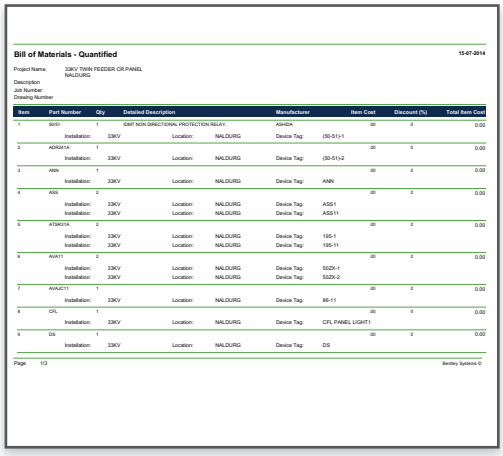
Ashida Electronics | Mumbai, Maharashtra, India

Control and Relay Panel for 132/33 kV





Bill of Materials - Quantified 15-07-2014

Project Name 33KV TWIN FEEDER CR PANEL NALDURG
Description
Job Number
Drawing Number

Item	Part Number	Qty	Detailed Description			Manufacturer	Item Cost	Discount (%)	Total Item Cost
1	50/51	1	IDMT NON DIRECTIONAL PROTECTION RELAY.			ASHIDA	.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	(50-51)-1			
2	ADR31A	1					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	(50-51)-2			
3	ANN	1					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	ANN			
4	ASS	2					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	ASS1			
	Installation:	33KV	Location:	NALDURG	Device Tag:	ASS11			
5	ATSR31A	2					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	19S-1			
	Installation:	33KV	Location:	NALDURG	Device Tag:	19S-11			
6	AVA11	2					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	50ZX-1			
	Installation:	33KV	Location:	NALDURG	Device Tag:	50ZX-2			
7	AVAC11	1					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	86-11			
8	CFL	1					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	CFL PANEL LIGHT1			
9	DS	1					.00	0	0.00
	Installation:	33KV	Location:	NALDURG	Device Tag:	DS			

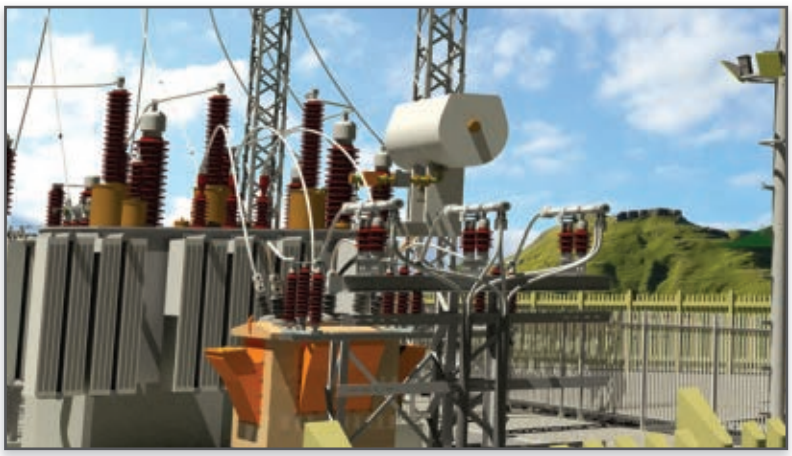
Page 1/3 Bentley Systems ©

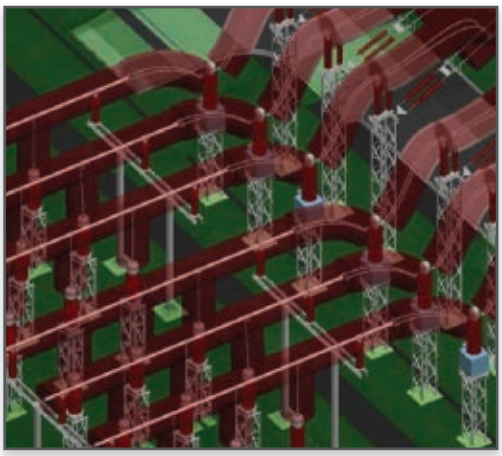
Ashida Electronics, designers and manufacturers of electrical power protection relays and SCADA systems in Mumbai, Maharashtra, India, undertook this INR 120,000 project to design and supply a 33-kilovolt twin feeder protection panel. Ashida chose Bentley's promis•e as an innovative solution for schematics and termination design. The software allowed the project team to design, engineer, and build the panel layouts under one roof.

Using promis•e ensured that any changes to schematics were automatically updated in the deliverables. The ability to produce accurate deliverables reduced the company's manufacturing costs by 20 percent because there were fewer last-minute changes. With Bentley technology, the project was finished one to two months ahead of schedule, which gave Ashida time to manufacture and test the panel internally to avoid problems during installation and commissioning.

Aurecon | Mandini, KwaZulu-Natal, South Africa

Matthew 132/11 kV Substation



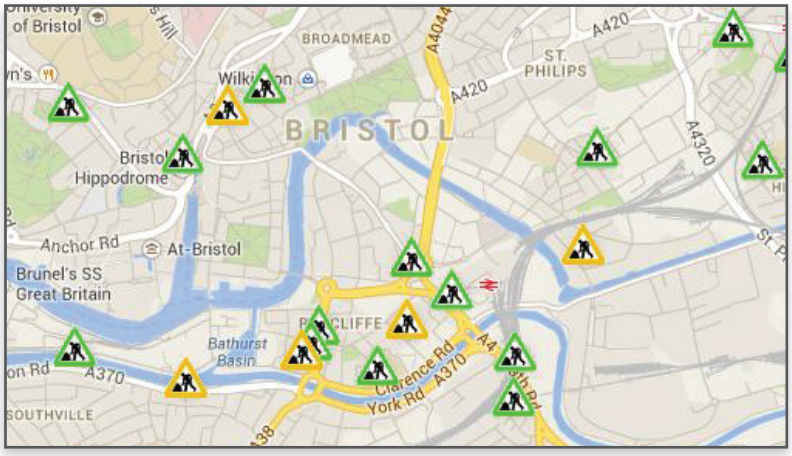


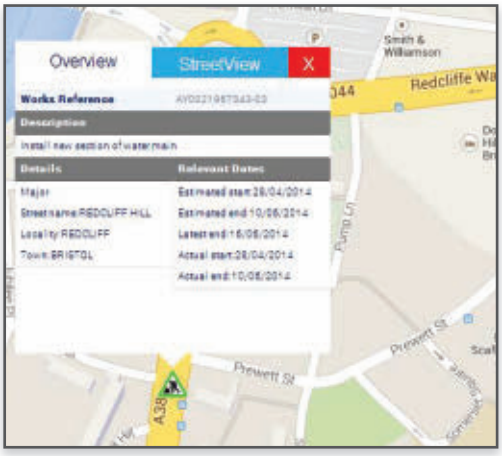
Aurecon designed and built this greenfield 132/11 kV substation for Umgeni Water, a state-owned entity and the largest supplier of bulk potable water in the province of KwaZulu-Natal, South Africa, to provide power for a water purification plant supplying water to the Mandini area. Bentley software made it possible to complete and approve the design for this ZAR 40 million project within 2.5 months, compared to the usual six to nine months.

Bentley Substation accelerated design by providing quality check processes, required safety clearances for equipment, and other functions. The bill of materials reflected accurate quantities, which meant compiling tender documents also took less time. An interactive PDF environment allowed the client to review an interference-free design, where the 3D model integrated civil and electrical design.

Bristol Water | Bristol, United Kingdom

Mapping the Works





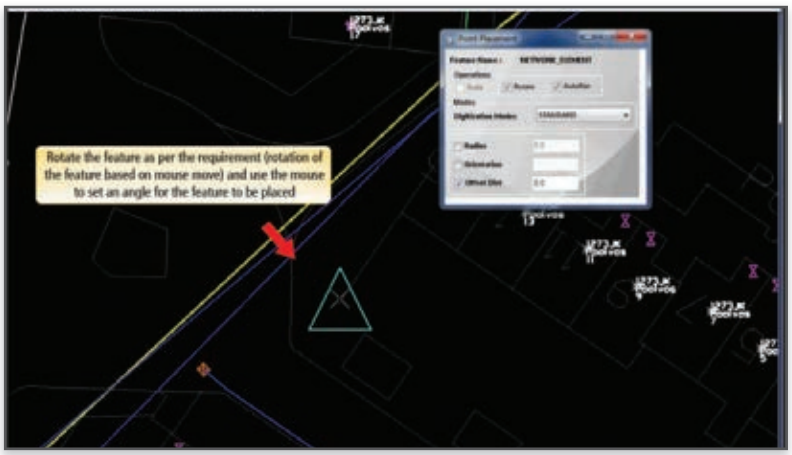
Bristol Water supplies water to over 1.1 million people in a more than 2,400-square-kilometer area centered on Bristol, United Kingdom. To provide customers with up-to-date information about street works and reduce the number of customer contacts for such information, the company implemented a customer-facing map with street works details. This frees up the help desk to manage emergency calls.

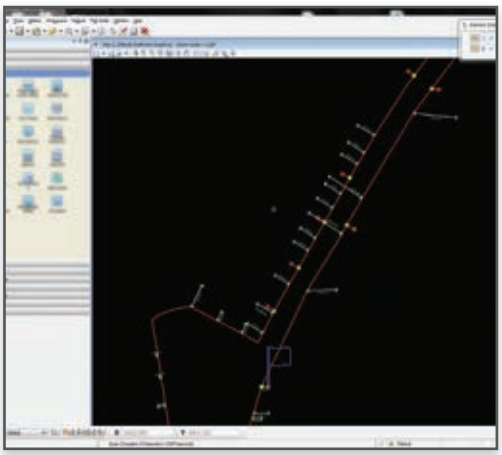
The interactive map shows an up-to-date view of work Bristol Water is doing or plans to do. Clicking on any of the symbols reveals more information about that job. An internally facing map provides contractors and regulatory bodies with more detailed project information. The maps, powered by Bentley's Exor asset management application, improve customer service while lowering customer call volume.

Innovation in Utilities and Communications Networks

Cyient Ltd | Hyderabad, Telangana, India

Spatial Conversion Solutions Through InTelEct



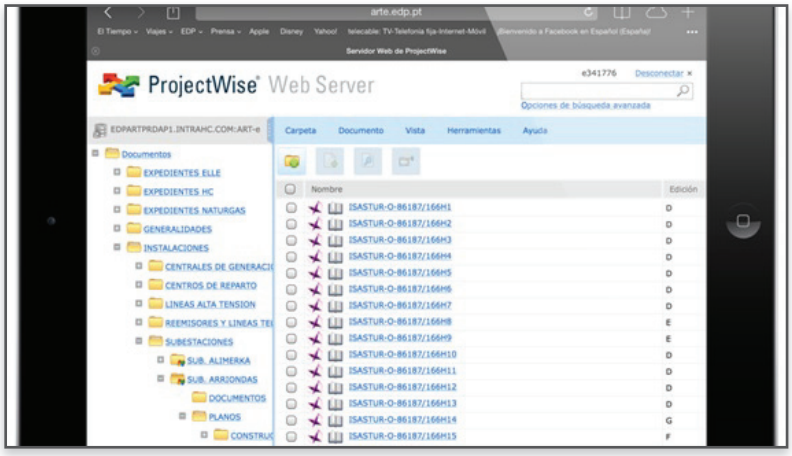


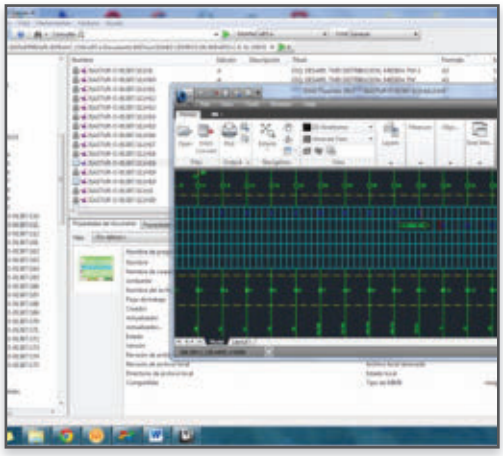
Cyient Limited is an engineering, network, and operations solutions company with 38 global locations and headquarters in Hyderabad, India. For this USD 350,000 project, Cyient developed an in-house production environment for use by teams across the organization in the design of electric and communication networks. The goal was to develop a customizable, scalable, and upgradable framework that optimized technology investments.

The core application (InTelEct) was developed as a generic data model that serves as a starter platform for facility management systems. InTelEct was built on Bentley Map, Oracle Spatial, and Microsoft C# .NET. MicroStation and InTelEct were customized for each client. With its data handling capabilities and high degree of automation, the application reduced processing times, improved design quality and flexibility, and optimized data conversion times.

EDP España | Oviedo, Asturias, Spain

ART-e





EDP Spain, a leader in the production, generation, distribution, and supply of electricity and gas, provides services to more than 2 million customers throughout Spain. The goal of this project was the technological renovation of the company's technical engineering document management system, which had become obsolete as software versions and hardware technologies had not been advanced.

EDP Spain chose ProjectWise to update the system. The immediate advantages of the ProjectWise implementation included more efficient management of technical documentation, improved user response time, improved document security and version control, extended control of the document lifecycle, and expanded accessibility to external companies through a new Web interface.



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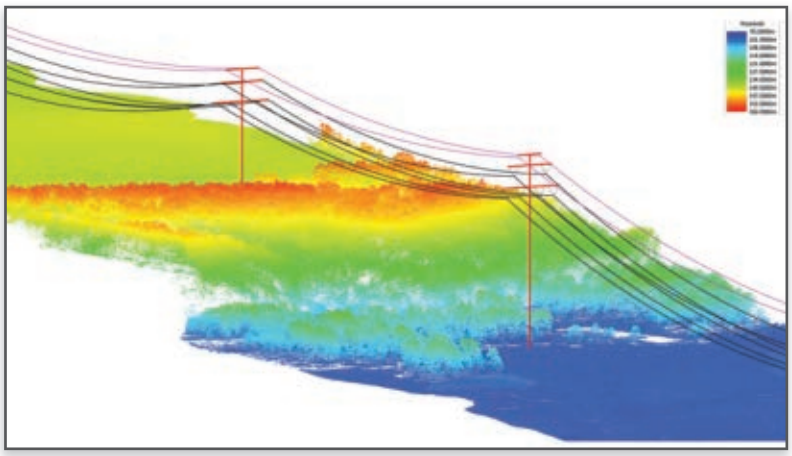
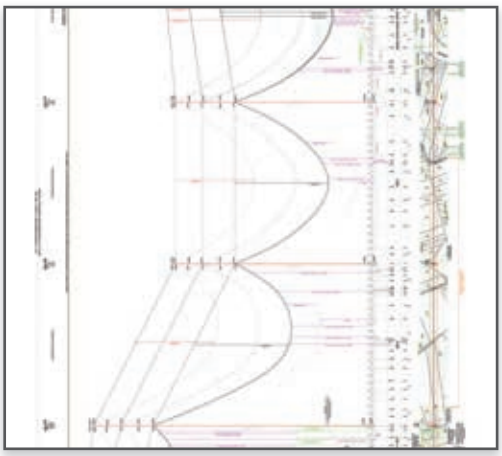
ELBUD-PROJEKT Warszawa Sp. z o.o. | Poland

Construction of 400kV Distribution Line



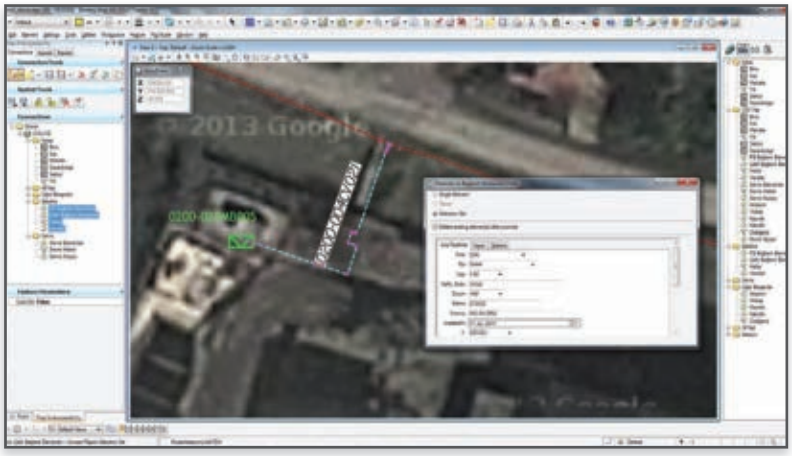


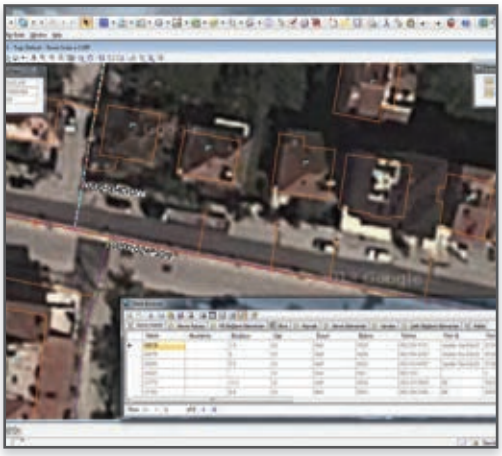
The goal of this PLN 10 million project was to design and build a double-circuit 400-kilovolt overhead power line connecting new power stations in northeastern Poland. ELBUD-PROJEKT Warszawa Sp. z o.o. reinforced its reputation as skilled designers of high-voltage networks by overcoming the significant challenges associated with running the line through the Narew Valley, where protected habitats had restrictive guidelines.

Use of the latest technology, including MicroStation and Bentley Descartes, allowed the project team to design the route with the smallest number of pillars and the largest span length between them. Moreover, correct interpretation of field data eliminated many adverse design factors. In addition, Bentley software reduced project delivery time and labor costs.

Enerya Gaz Dağıtım A.Ş. | Istanbul, Turkey

ENERgis – Enterprise Natural Gas GIS Project





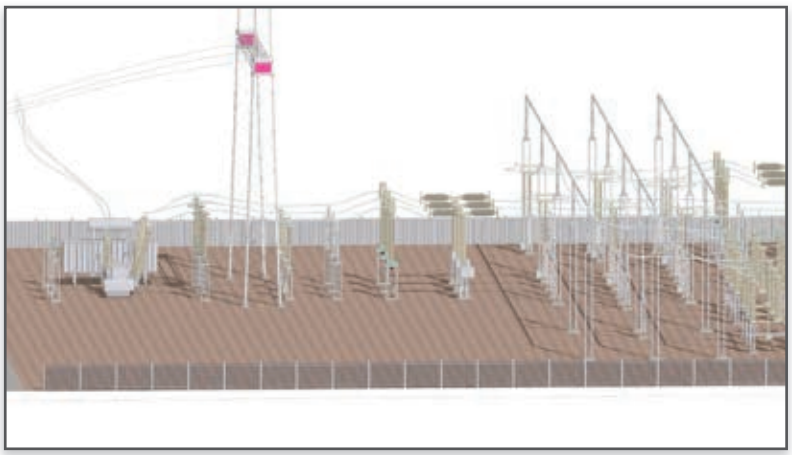
Enerya Gaz Dağıtım A.Ş. owns gas distribution and operation licenses for 10 cities in Turkey. The goal of ENERgis – Enterprise Natural Gas GIS Project – was to put the company's main assets, its gas network, at the center of its information system architecture. This USD 300,000 project will standardize the services delivered and build an enterprise GIS that is integrated with customer information and operation and maintenance systems.

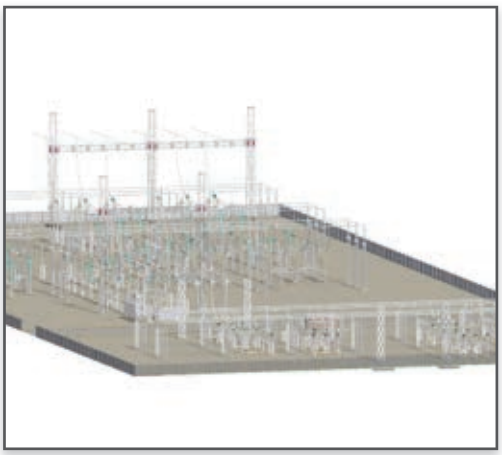
The scope of work included building an Oracle Spatial-based enterprise GIS with Bentley Map, building a central management module with ProjectWise Geospatial Server, integrating the GIS and other systems via Web services, and using GIS data for field operations with Bentley Map Mobile. To centrally manage GIS data, project documents, and customer registrations, Enerya implemented ProjectWise with a caching mechanism that allows faster access to information.

Innovation in Utilities and Communications Networks

Eskom Holdings SOC Limited | Johannesburg, Gauteng, South Africa

Bentley Substation Proof of Concept Project – Greytown MTS



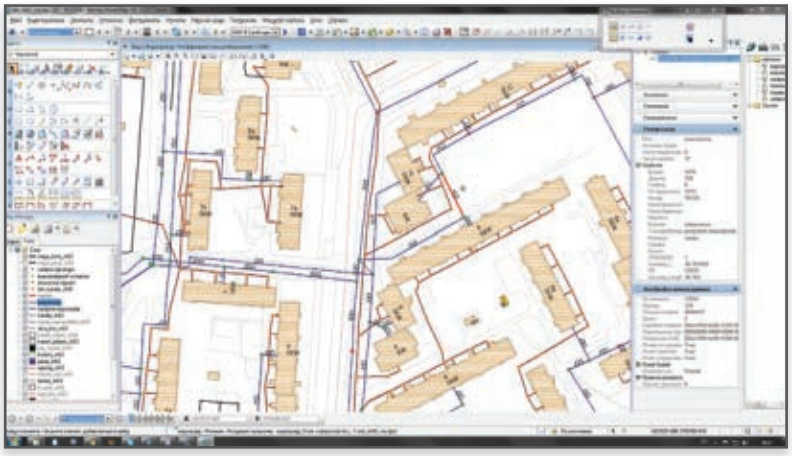


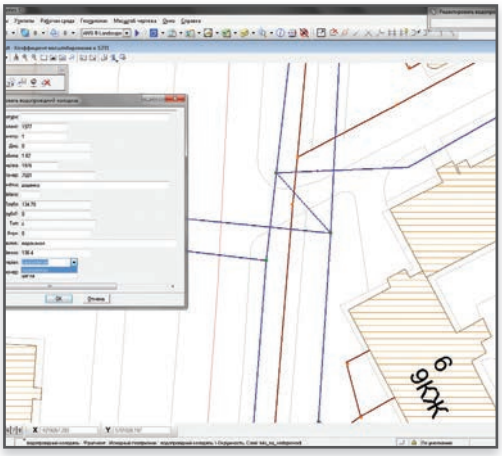
Eskom generates approximately 95 percent of the electricity used in South Africa and 45 percent of the electricity used in Africa. Before replacing conventional substation design methods with the Bentley platform, Eskom selected a proof-of-concept project to test the approaches in parallel. The team initiated simultaneous design development for one of three transmission stations for Greytown Metropolitan Transit Station.

Although the "real" project was deferred due to financial constraints, the proof-of-concept design continued using Bentley Substation and Bentley Navigator. Despite the time it took to create the initial database, the overall duration of the project was substantially less than it would have been with conventional methods. Clash detection and resolution also proved to be effective with i-models. Initial estimates indicated a 40 percent reduction in design delivery time through the use of Bentley technology.

Municipal Enterprise Chernigovvodokanal of the Chernihiv City Council | Chernihiv, Chernihivskaya, Ukraine

Creating a System for Remote Monitoring and Control of Water and Wastewater Processes



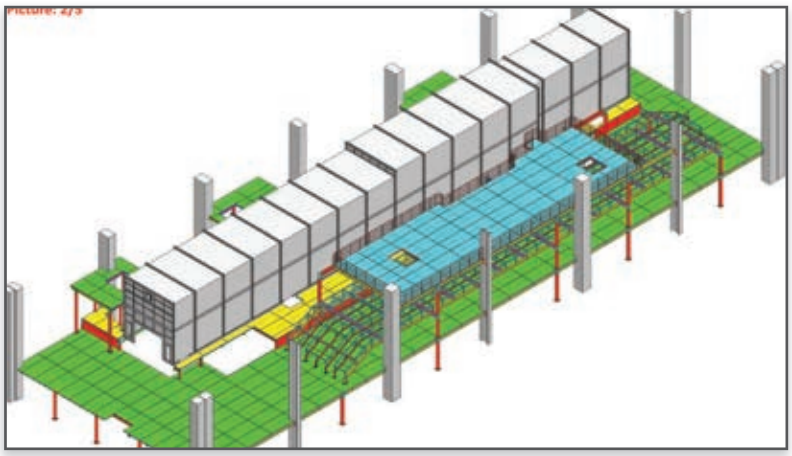


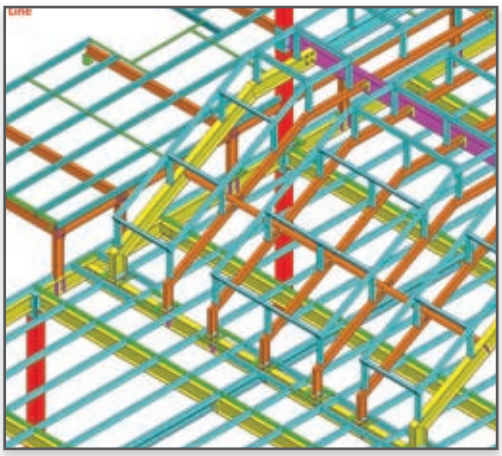
The municipal enterprise Chernigovvodokanal specializes in catchment, treatment, and distribution of water; construction of municipal pipelines; and engineering and construction works. In this project for the city of Chernihiv, an historic city in northern Ukraine, the city council invested USD 1.66 million to create a system for remote monitoring and control of water and wastewater processes in the city.

The scope of work involved integrating a local automated control system installed by Chernigovvodokanal with retrofitted equipment that implements system functions. The system provides operational management and control of technological processes and equipment; maintenance and optimization of the water supply system; and early detection, localization, and elimination of failures. The system will reduce plant staffing requirements and save energy, water, and chemicals. Bentley Map and WaterGEMS were implemented.

Municipality of Almelo | Almelo, Overijssel, Netherlands

Water Boulevard Almelo





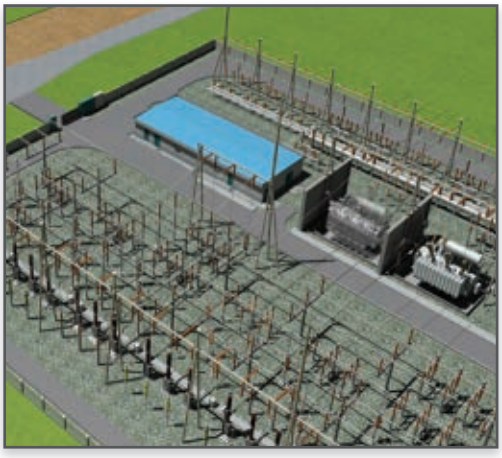
Located in the eastern Netherlands' Twente region, the city of Almelo, Overijssel, has 72,000 residents. The Municipality is taking a federated approach to managing subsurface utilities with construction of a water boulevard, where myriad utilities align in one channel. The city center project site and multiple stakeholders – representing water, sewer, cable, telephone, and electricity – posed major challenges.

Bentley solutions included Bentley Map, Bentley Descartes, InRoads Suite, Bentley PowerCivil for Benelux, and Bentley Subsurface Utility Engineering. Interoperability of these tools facilitated collaboration among project participants. The 3D model supported design of utilities realignment, culvert reconstruction, and ground-level reconstruction. A 4D visualization supported multi-stakeholder project coordination. The Municipality expects a 10 percent reduction in costs and risk as a result of using the models for information exchange and project coordination.

PowerChina Hubei Electric Engineering Corporation | Jingzhou, Hubei, China

Xiandong Jingzhou 220 kV Substation





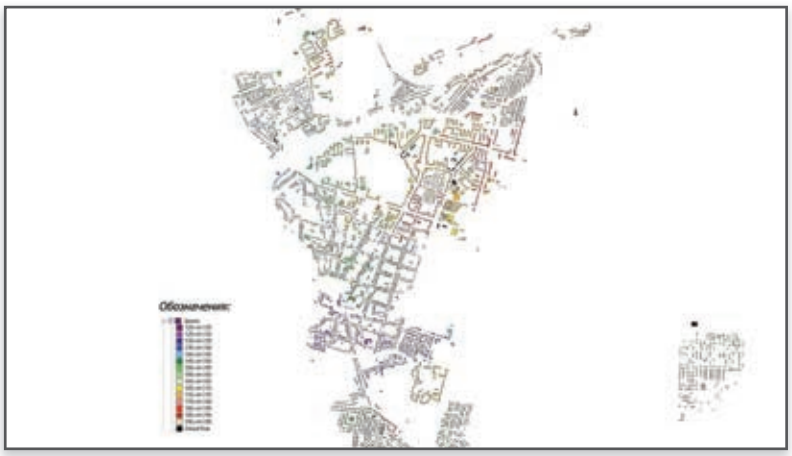
The Xiandong Jingzhou 220 kilovolt substation in China's Hubei province is a new-generation intelligent substation demonstration project by State Grid Corporation of China (SGCC). PowerChina Hubei Electric Engineering Corporation designed the substation in 3D, which significantly improved efficiency and quality, and created a 3D information model for construction simulation and digital handover to SGCC.

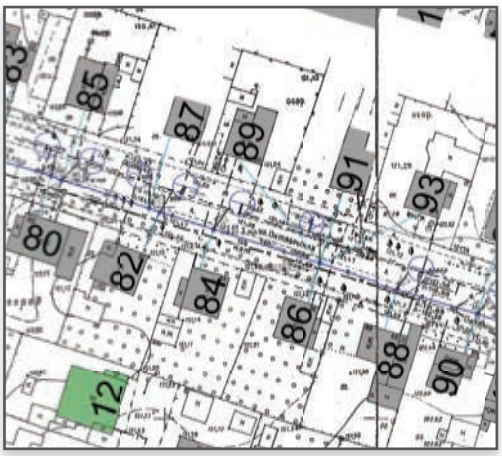
The Bentley platform provided solutions to numerous technical challenges. It allowed project data to be transmitted across the full engineering lifecycle, which improved design, construction, and operation management. Accomplished in nearly half the time, the design reduced land area by 40 percent, saving more than CNY 2.15 million in land investment. Products included Bentley Substation, AECOsim Building Designer, Bentley Raceway and Cable Management, GEOPAK, ProjectWise, eB Information Manager, and Bentley Navigator.

Innovation in Utilities and Communications Networks

REMONDIS Arzamas Service LLC | Arzamas, Nizhny Novgorod Region, Russia

Creation of a Geoinformation System for Water Supply and Sanitation in Arzamas City and District





REMONDIS Arzamas Service LLC (RAS) invested RUB 3 million in the creation of a geoinformation system for the water supply and sanitation system serving the city of Arzamas and Arzamas district in the Nizhny Novgorod region of Russia. The goals of this project included reducing costs, improving service, increasing system reliability, and mapping the municipal water and sewer networks.

Bentley Map provided fast and accurate geospatial data creation, maintenance, and analysis. The software not only quickly and effectively enabled teams to work with a GIS, but also made it possible to export data in i-models for offline work so employees can use GIS in the field. RAS was also able to download data in shapefiles and transfer the shapefiles to WaterGEMS for hydraulic modeling of the Arzamas municipal water supply.

Stadtwerke Sindelfingen GmbH | Sindelfingen, Baden-Württemberg, Germany

Bentley sisIMS Goes Mobile!





The Sindelfingen Department of Public Works (Stadtwerke Sindelfingen GmbH), Baden-Württemberg, Germany, used Bentley technology to supply geodata to mobile terminals. As a result, all business departments can access geodata without having to use special interfaces. This improved the effectiveness of work processes in the department's network operations.

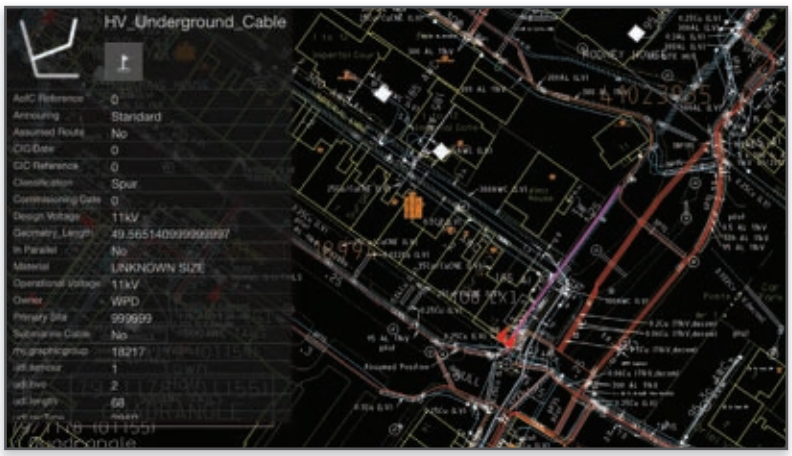
The third-party software, gis2app, requests Web map services from Bentley sisIMS, then visualizes the network data on a mobile terminal supported by the Blackberry Enterprise Mobility Management platform. Combining Bentley sisIMS with the Open Geospatial Consortium-conforming sisNET data model enabled a fast implementation. Using Bentley products across the board allowed the department to stay within budget. The initial investment of EUR 15,000 was repaid within months of implementation through reduced time and travel expenses.



>>>> **VIEW PRESENTATIONS** @ *www.bentley.com/projects2014*

Western Power Distribution | Exeter, United Kingdom

Development of Bentley Map Mobile for Field Operations





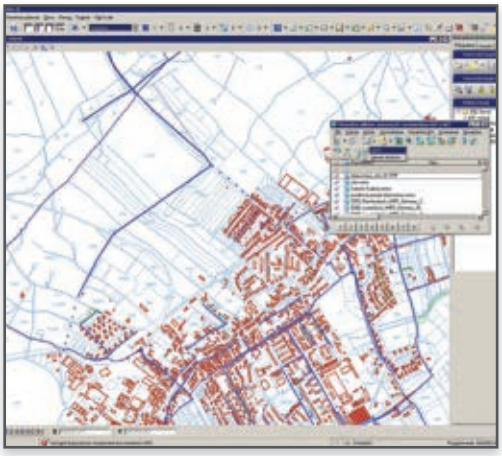
Western Power Distribution (WPD) is the electricity distribution network operator for more than 7.8 million customers in the U.K.'s Midlands, South West, and Wales. WPD's network consists of 220,000 kilometers of overhead lines and underground cables, and 185,000 substations. This GBP 1.3 million proof-of-concept pilot project brought Bentley Map Mobile to some 2,300 field operators using Apple iPads.

Bentley Professional Services developed mobile app technology to distribute and record utility asset data, delivering functionality comparable to that available with Bentley Navigator on a laptop. Field updates are sent to WPD headquarters for map revision, and up to 5,000 asset changes per week are loaded to i-models for distribution to the field via Wi-Fi. This mobile technology will improve project delivery time and reduce the risk of errors.

Wodociągi i Kanalizacja Sp. z o.o. | Dzierżoniów, Poland

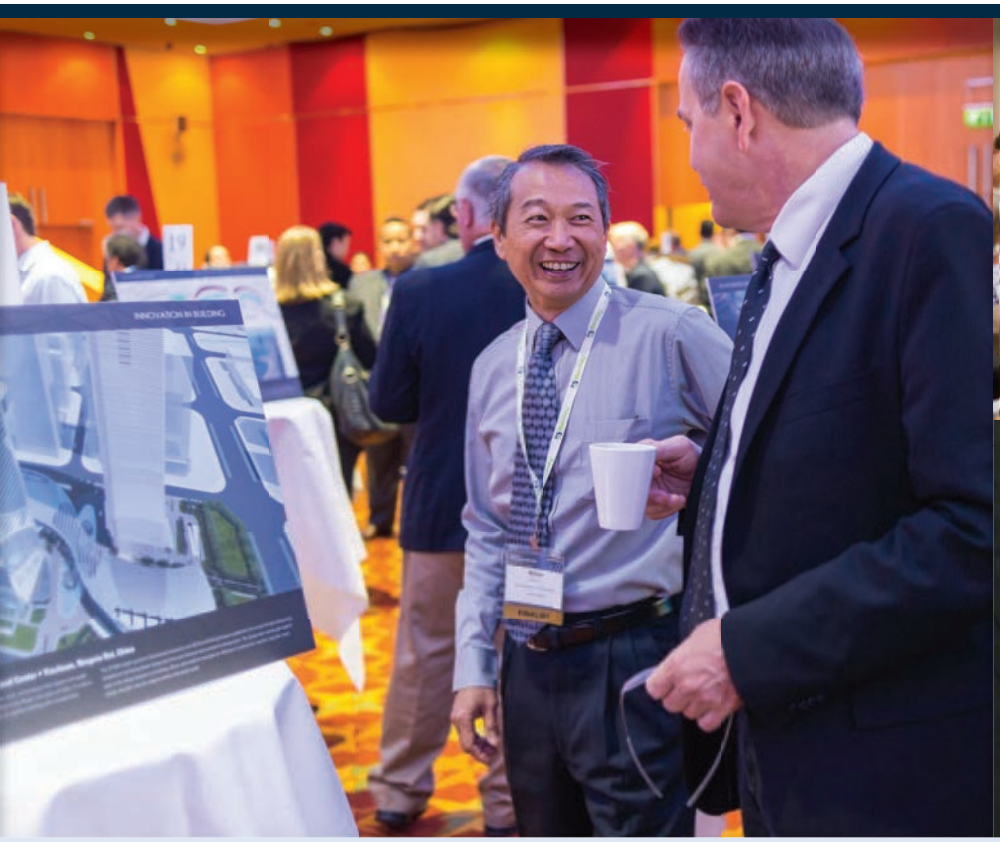
Construction of Information System





Wodociągi i Kanalizacja Sp. z o.o. is a water and sewer company serving the county of Dzierżoniów, Poland, including six municipalities with approximately 500 kilometers of water networks, 220 kilometers of sewerage systems, 10 water treatment stations, and three sewage treatment plants. This PLN 100,000 project created a complete database of the water supply and sewerage network.

The project team scanned and calibrated about 700 basic maps and incorporated hundreds of surveying inventories, inspections, and other existing information into a single database. Bentley Map and Bentley View provided the interface to interact with water and sewer data from various sources. Visualizations and network modeling are now possible with this well-constructed system of spatial information, making the working environment of the company transparent, economical, and innovative.

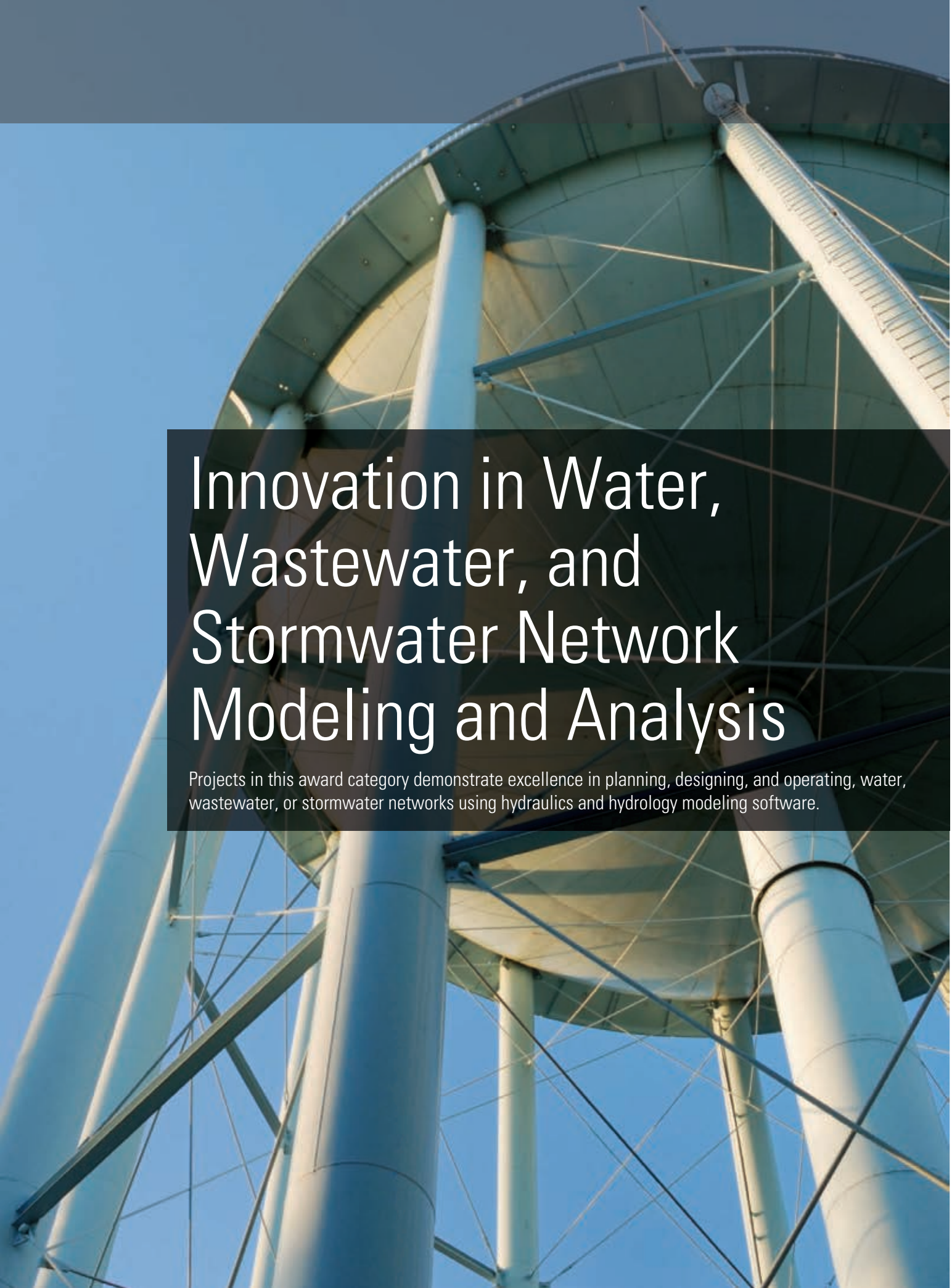






"Through our company's effective use of SewerGEMS, we were able to come up with the best possible option for every project which enables us to manage and reduce the impact of the environmental, social, technical, financial, and political risks of these projects."

– Christian Henry Lacson, Manila Water Company, Inc.



Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

Projects in this award category demonstrate excellence in planning, designing, and operating, water, wastewater, or stormwater networks using hydraulics and hydrology modeling software.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

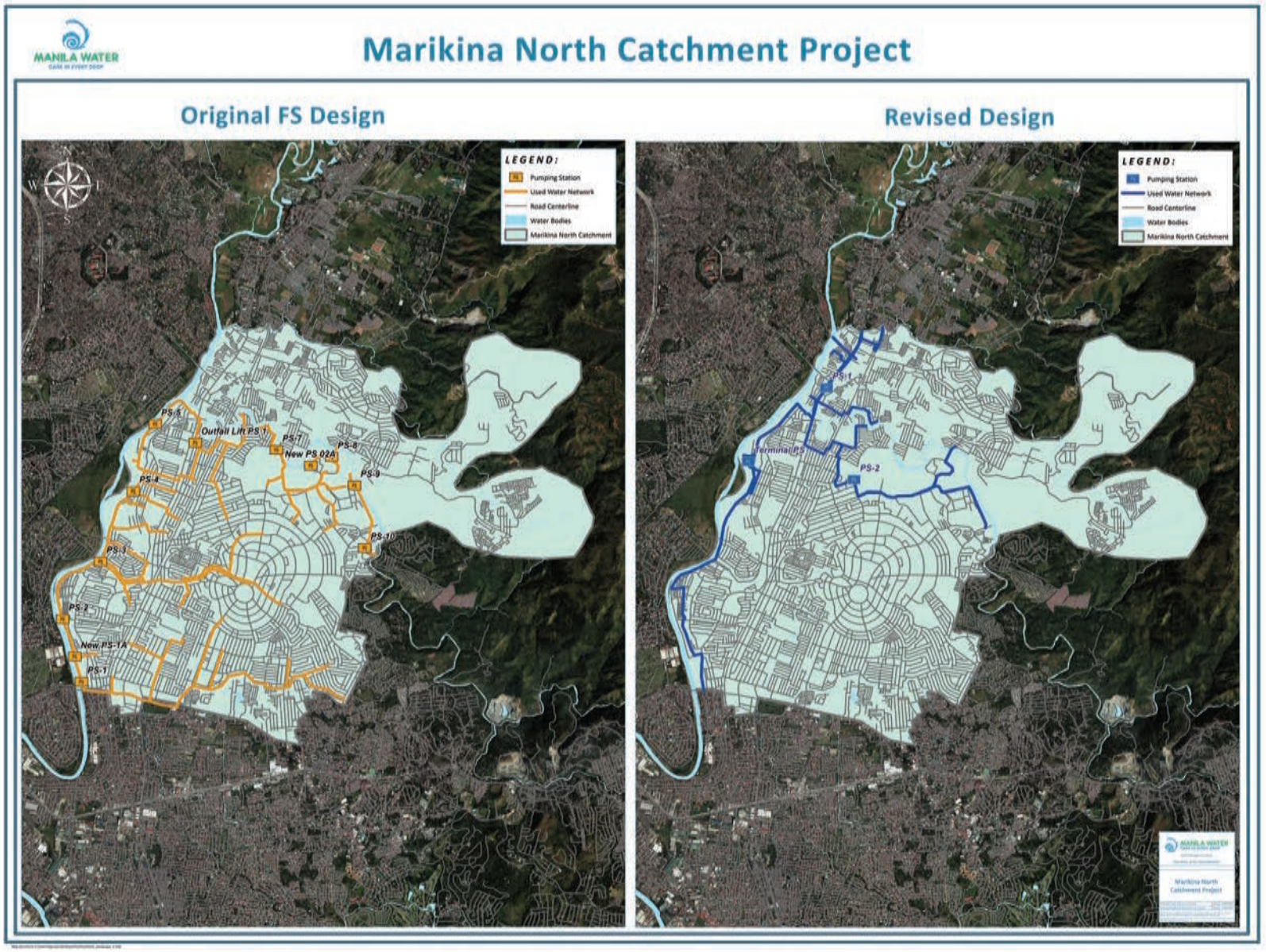
WINNER

Manila Water Company, Inc. | Marikina City, Philippines

Marikina North Project

The ultimate goal of this PHP 4.11 billion project was to treat all wastewater discharging into the three major river systems (San Juan River, Pasig River, and Marikina River) from Marikina City in the Philippines. It encompasses the construction of a sewage treatment plant with a capacity of 100 million liters of treated water per day and a 23-kilometer sewer network.

Using SewerGEMS, Manila Water Company was able to reduce the number of pump stations from the originally projected 12 pumps to just three pumps, which significantly reduced the environmental, financial, technical, and social risks involved in constructing the facilities. SewerGEMS made it possible to shift from one scenario to another with relative ease, given the complexity of the project and the number of factors affecting the planning and design.







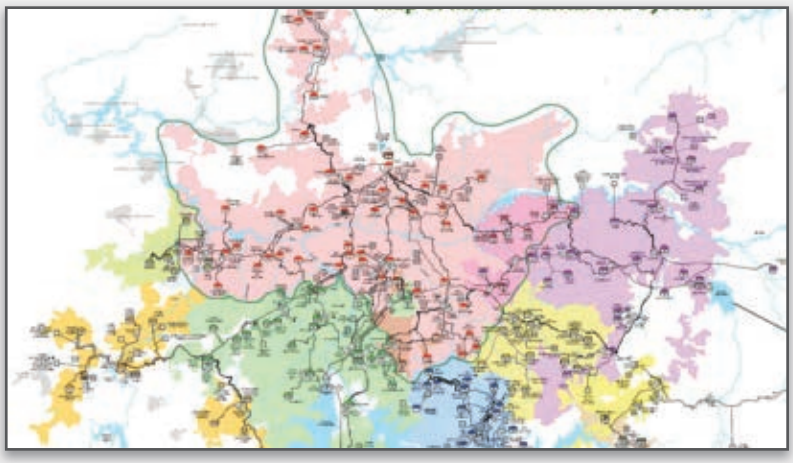
FINALIST

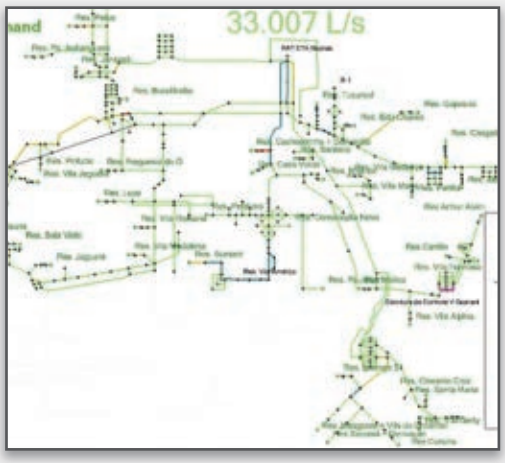
AECOM India – Delhi Jal Board | New Delhi, Delhi, India

Sewerage Master Plan – 2031 for NCT of Delhi

The burgeoning New Delhi, India, population, coupled with slow and unorganized development in sewage infrastructure, has posed a major threat to the city's sanitation issues, subsequent river water quality, and public health of the inhabitants. AECOM was engaged by Delhi Jal Board to develop an integrated and sustainable master plan for 2031, along with carrying out hydraulic designs and tendering works.

This USD 3.25 billion project covers an area of around 1,500 square kilometers. AECOM used WaterGEMS and SewerGEMS to model this area, which included 10,000 kilometers of a sewerage network for unsewered areas. By using pre-defined queries extensively, integration with GIS, automated load calculations, scenarios, and alternatives, along with excellent representation of design and simulation outcomes, AECOM saved significant design time.





FINALIST

Sabesp | São Paulo, Brazil

Overview and Supervision: Cantareira Water Supply System

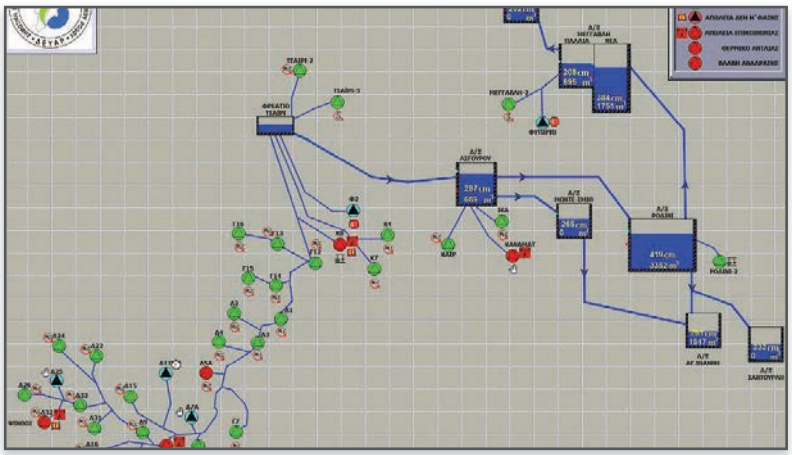
This BRL 280 million project improved the largest water supply system in São Paulo, Brazil – the Cantareira water supply system – which has been operating for more than 40 years and now serves a population of 9 million.

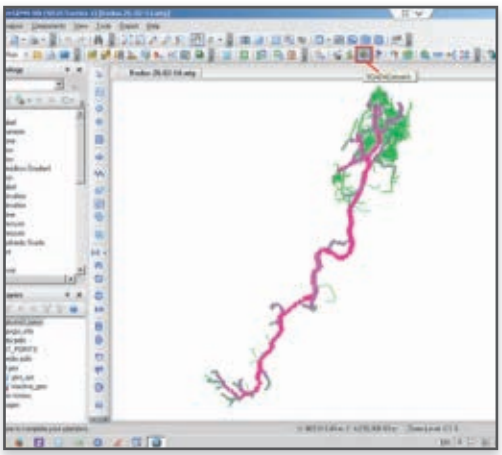
WaterGEMS allowed Sabesp to diagnose exceeding velocity and deficient flow rates for the present and future based on projected population growth and water demands, which confirmed future electricity costs and the increased lifespan of deployed assets that now included expanded storage capacity and duplication of water mains, ensuring adequate water supply. With this hydraulic project, pump operations were optimized taking advantage of off-peak hours. The field data were transferred to the office via two software solutions: supervisory (SCADA) and GIS, both of which interfaced with WaterGEMS.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

AKATT S.A. | Rhodes, Greece

Automation Systems for Remote Control, Operation, and Water Leak Management



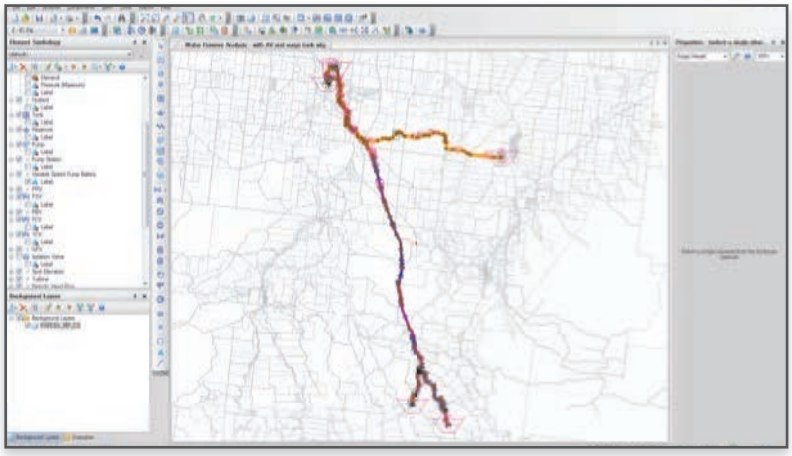


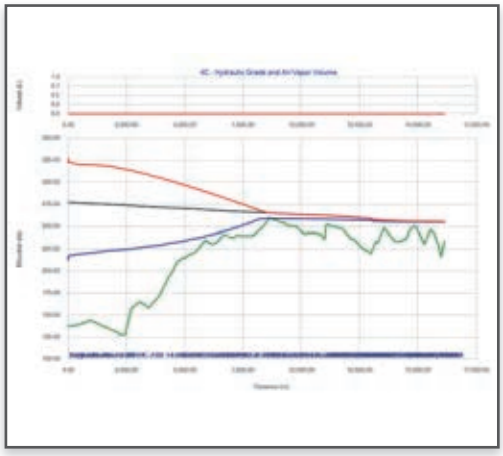
The Municipal Water and Sewerage Company of Rhodes (DEYAR) manages the water and sewerage network of Rhodes Island in Greece, which consists of 50 water wells that feed nine water tanks. The primary goal of this EUR 2.2 million project was to implement water leak control to improve pump efficiency through the cost-effective operation of the water pumps as well as to maximize the municipality's water supply consumption.

AKATT's challenge was the integration of software products on a common platform so the software could exchange data. For the water network modeling and simulation, AKATT deployed WaterGEMS. Through WaterGEMS' SCADAConnect module, data from the SCADA database was imported into WaterGEMS. The water leak detection and control, as well as the prompt repair of damaged pipes in the water network, reduced water loss, which led to increased revenue for DEYAR.

Barwon Water | Geelong, Victoria, Australia

Colac Water Hammer Analysis

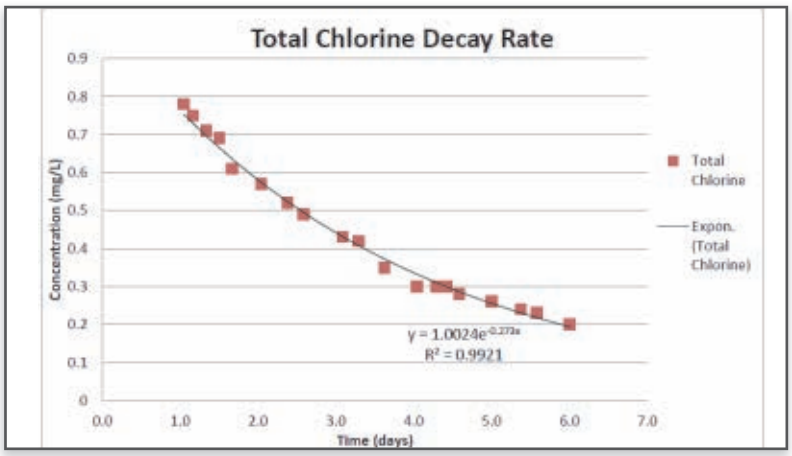


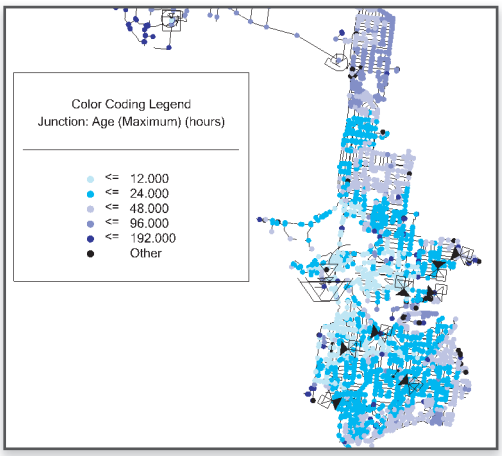


Through demand forecasting and system yield analysis, the Colac water supply network in Geelong, Australia, was identified as needing augmentation. This project built a transfer main for water from the Wurdee Boluc channel to the Colac water treatment plant. The challenge was that alignment for this transfer main relied on a transient analysis of each alignment to determine appropriate surge-protection measures.

As with any water hammer analysis project, Barwon Water would have had to perform manual iterations of the model in order to optimize the appropriate surge protection to achieve the desired results while maintaining suitable transient pressure in the transfer main. WaterGEMS automated the investigation of the transient pressure in the transfer main, and HAMMER assisted in selecting the appropriate pipe alignment and surge protection.

Barwon Water | Geelong, Victoria, Australia
Water Quality Modelling



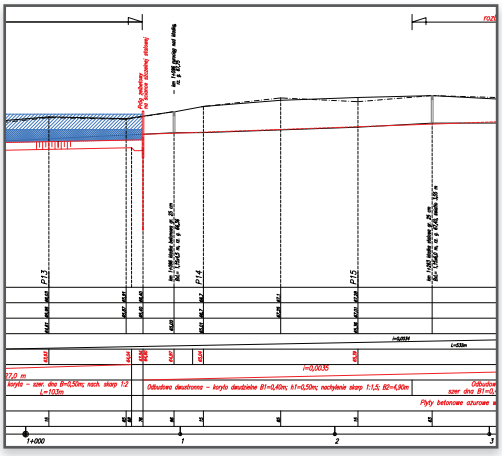


Barwon Water serves an 8,100-square-kilometer area in Victoria, Australia. Maintaining a high-quality water supply to all customers involves understanding the intricacies of the water supply network. This project modeled chlorine residuals throughout the distribution system via the development of chlorine decay rates to create a calibrated model that then was used to analyze and optimize the chlorine residuals throughout the network.

The primary objective of the water-quality modeling was to establish a pilot project in this area to determine the viability of establishing water-quality models for planning and operational analyses. On this project in Geelong, Barwon Water used WaterGEMS to model alternate scenarios, which reduced the risk of implementing a weaker solution, through the ability to analyze the performance of the system under varying conditions.

BIPROWODMEL Sp. z o.o. | Pozna, Wielkopolska, Poland
Rainwater and Meltwater Management





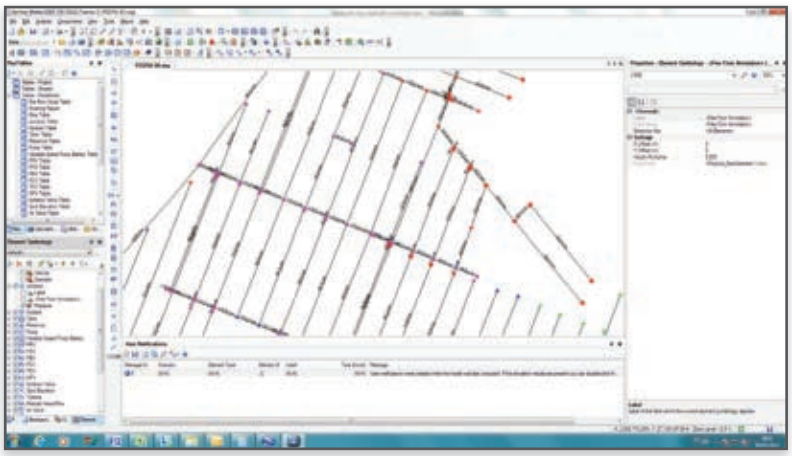
This PLN 1.23 million project developed a rainwater and snowmelt management strategy for the natural streams and valleys in the city of Pozna, Poland. The challenge was to connect the rainwater drainage system with surface water courses into a single computational model by obtaining and standardizing archival materials and other information about the area, its planned development, and stormwater networks, to one common format.

SewerGEMS enabled BIPROWODMEL to process and interchange data among platforms ranging from the processing of raster data and field surveying through digitization to computational modeling and conception/design aimed at determining the best technical, economical, and environmental solutions. The company estimated that SewerGEMS reduced the costs of modeling and analyzing stormwater drainage scenarios by 70 percent.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

CAB Cuiabá | Cuiabá, Mato Grosso, Brazil

Improvement of Pedra 90 Region Water Supply System



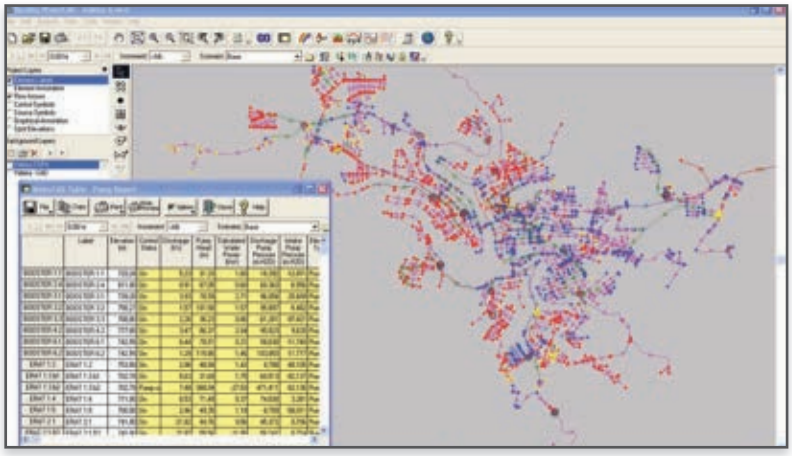


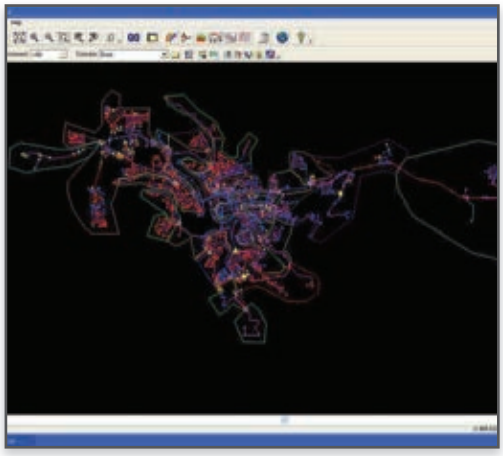
The Pedra 90 neighborhood in Cuiabá, Brazil, lies within one of the water sectors supplied by the Tijucal water treatment plant. The region is part of the sector that serves 7,652 residential connections. The goals of this BRL 1.4 million project were to improve the water supply system in terms of availability and pressure, search for leaks, and standardize connections to eliminate illegal connections and water fraud.

CAB Cuiabá modeled the water distribution system using WaterGEMS, which helped reduce the overall operational costs of the project as leakages and fraud connections were identified. CAB Cuiabá reduced energy consumption through an average reduction in energy bills of 26.54 percent. Some months experienced reductions up to 51.68 percent. Before this project, the region had 6,472 connections. Now it has 7,500, all of them standardized.

CASAN | Videira, Santa Catarina, Brazil

Diagnosis and Improvement of Videira's Water Supply System



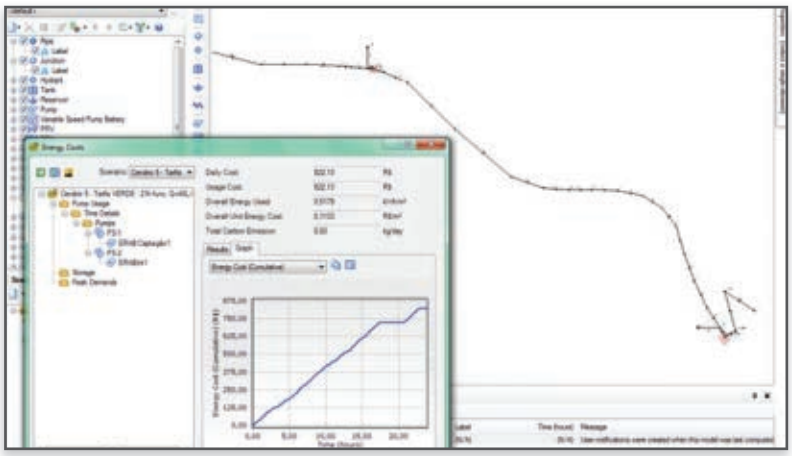


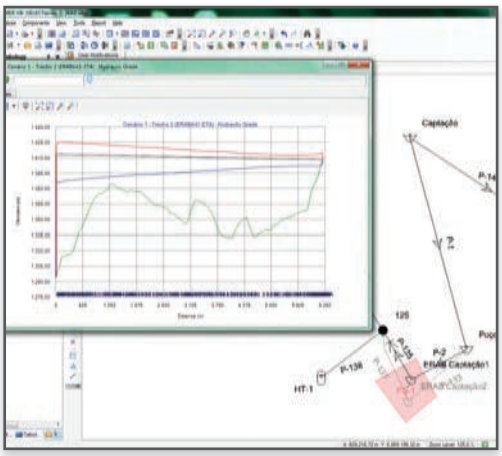
The city of Videira, Brazil, which has a population of 53,000 inhabitants, is supplied by water diverted at Rio do Peixe and treated at a conventional water treatment plant. Due to the topography of the municipality, which has altitudes ranging from 400 meters to 1,600 meters, the water distribution system was fitted with 25 boosters spread over 22 supply sectors. The objective of this BRL 4 million project was to increase the daily volume of water to the city by 30 percent.

Using WaterCAD, CASAN identified the best allocation of resources for operational improvements and determined how to make the system more efficient by reducing power consumption and increasing the availability and quality of treated water to the residents. Previously, 41.7 percent of the water did not reach the consumer. After carrying out simulations on SewerGEMS and making improvements, the ratio dropped to 0.75 percent.

CASAN | São Joaquim, Santa Catarina, Brazil

São Joaquim Water Supply Alternatives Study



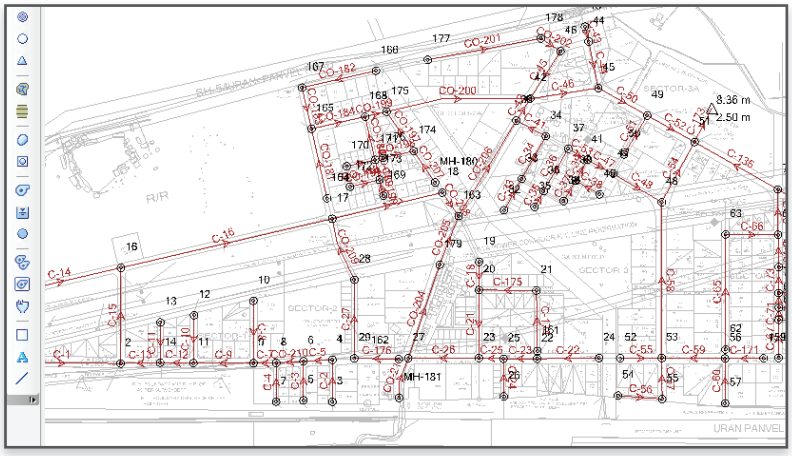


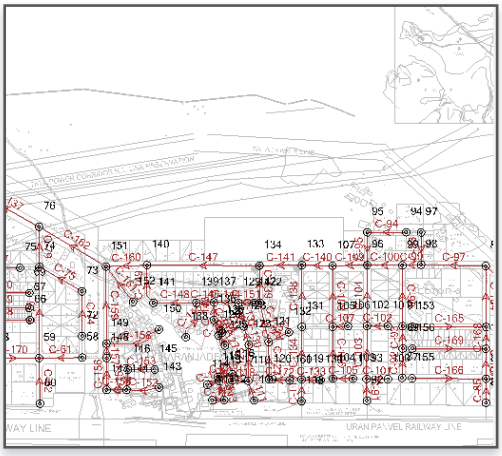
Because the water supply system in the city of São Joaquim, Brazil, was at its operational limit, a study of water source alternatives was initiated to define the best way to complement the existing one. This BRL 6 million project designed a new system for untreated water that leveraged energy efficiency by reducing operating costs and implementing safety in the booster system (main line and pumps) through the installation of hydropneumatic tanks.

CASAN input data into WaterCAD and simulated different scenarios, compared efficiencies and energy costs of various pumps available on the market, verified energy costs between scenarios with and without operating controls, defined the best diameter for the water supply system, and chose the best design for the project. Once the best alternative was defined, CASAN analyzed scenarios in the study of hydraulic transients using HAMMER.

CIDCO | Navi Mumbai, Maharashtra, India

Karanjade Sewerage System Design





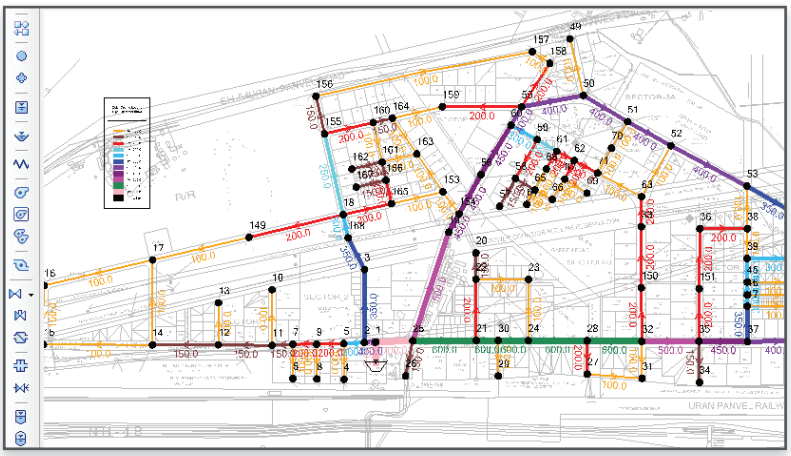
This INR 10 million project encompassed the hydraulic design of a 75-hectare water supply and sewerage network in Navi Mumbai, India, which resulted in dramatic improvements in the sanitation conditions of the people residing in the Karanjade area. A requirement of the project was to reduce the time required for design and optimization using innovative technology that could automate traditional and tedious manual processes.

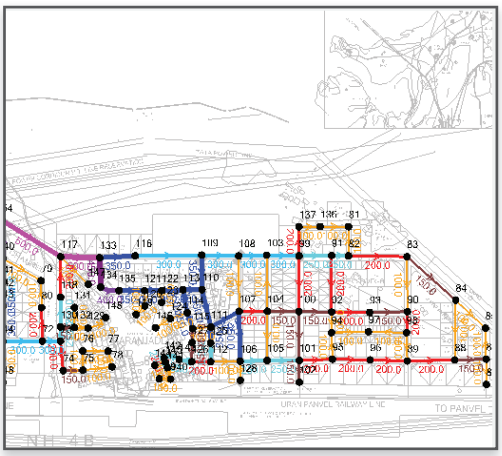
To design and simulate such a large water supply and sewerage network, CIDCO used SewerCAD to generate the drawings, profiles, and reports more quickly than it could using traditional methods. By providing interfaces for the integration of various software on different platforms, CIDCO reduced man-months by a factor of one-seventh – successfully achieving project payback within six months.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

CIDCO | Navi Mumbai, Maharashtra, India

Karanjade Water Supply System Design



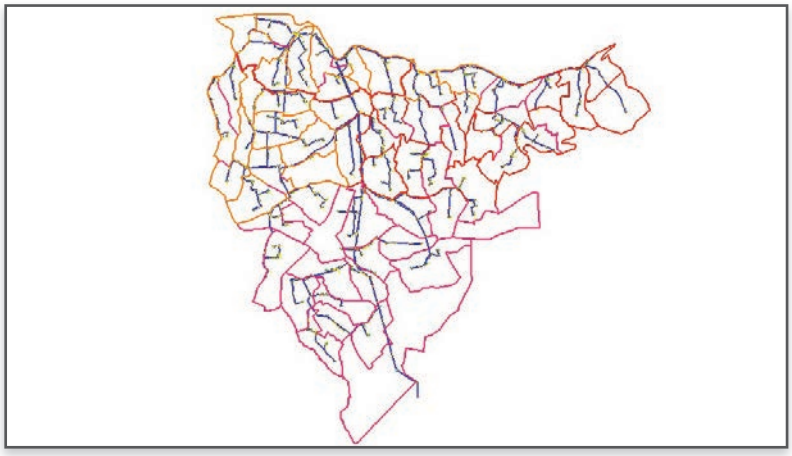


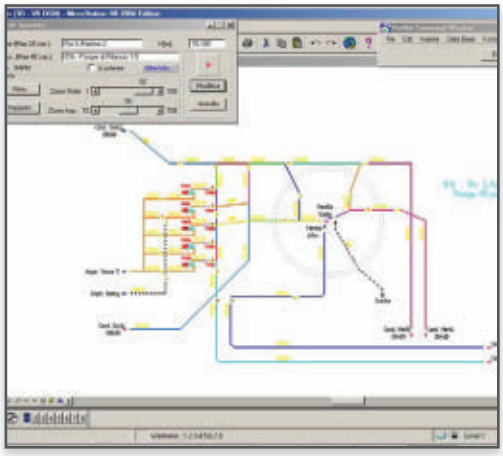
The design of the Karanjade water supply system encompassed 75 hectares of supply and sewerage networks in Navi Mumbai, India. The goal of this INR 10 million project was to simulate network behavior in congested areas in order to mitigate risk before construction of the facilities began. In addition to risk management, the project sought to proactively resolve complex regulatory compliance issues.

WaterGEMS offered the innovative approach that CIDCO was seeking by providing pre-defined queries, scenarios, and alternatives, along with excellent representation of design/simulation outcomes. Due to the large number of pipes required, network model calculations using traditional methods would have taken months. Using WaterGEMS, the company improved design precision and reduced design time.

CREA s.r.l. | Verona, Italy

Improving Network and Plant Management Through the Utilization of Mathematical Models



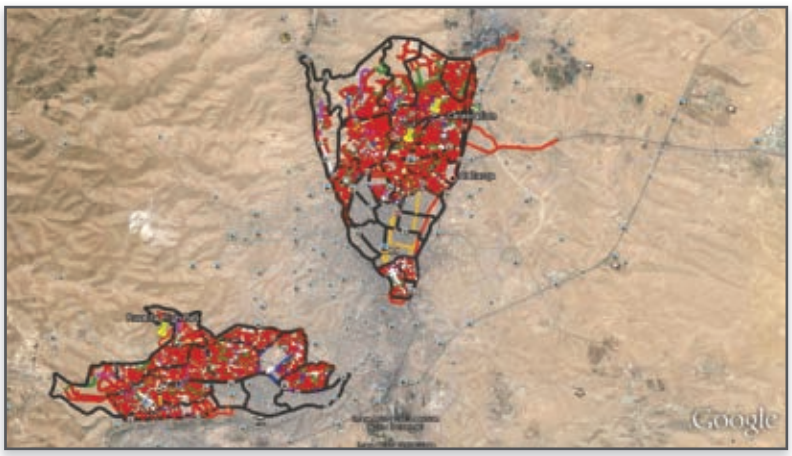


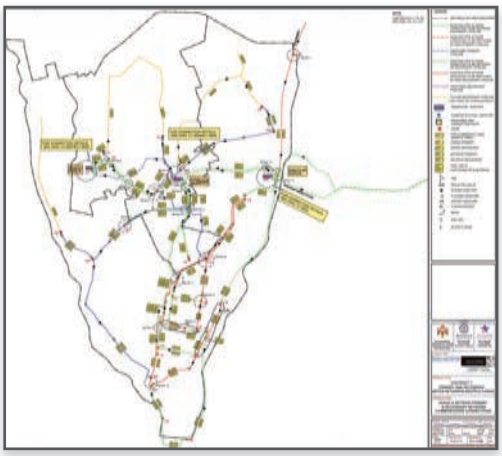
The goal of this EUR 150,000 project in Verona, Italy, was to distinguish carefully among the various available mathematical models of simulation so the modeling activity was focused on creating an accurate physical model of the network in MicroStation rather than a simple mathematical model.

CREA utilized technology to reduce the design costs by a factor equal to 40-50 percent, especially in the case of numerous load conditions. Using the management optimization model, CREA has saved 15-20 percent of the total costs for electricity expenses in pumping plants. When compared to the other options, the optimized design will save millions of euros.

Dar Al Omran, H&S, and NOD | Zarqa, Jordan

Zarqa and Russifa Water Network Restructuring and Rehabilitation



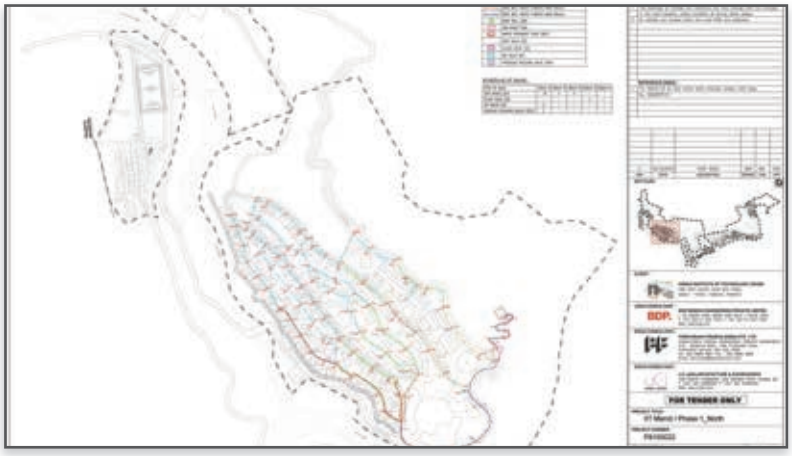


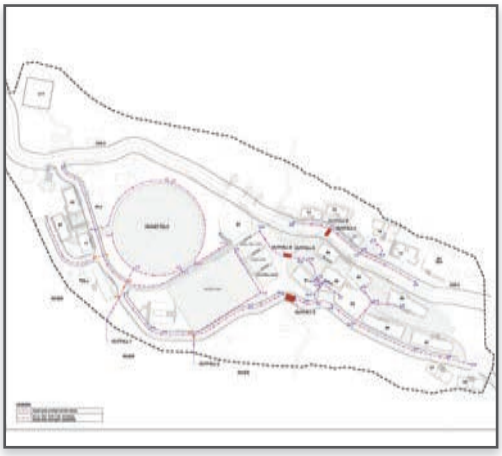
Dar Al Omran, H&S, and NOD partnered on this fast-track USD 75 million project for MCA-J to restructure and rehabilitate the water networks of Zarqa and Russifa, Jordan. The sheer scale and complexity of this unique project was compounded by difficult site topography and the intermittent nature of the existing supply network. The detailed design was dependent on the hydraulic modeling of the primary and secondary model and 32 sub-models.

WaterCAD facilitated the development of the complex base models, model scenarios, and subsequent migration of designs from the models to the detailed design and tender drawings. WaterCAD's interoperability with AutoCAD and ArcGIS allowed the transfer of existing GIS/network data into the model as part of the model build phase, developing complex water network models efficiently and cost effectively while minimizing modeling resources.

Frischmann Prabhu (India) Pvt. Ltd. | Mandi, Himachal Pradesh, India

Development of Indian Institute of Technology – Mandi Campus at Kamand





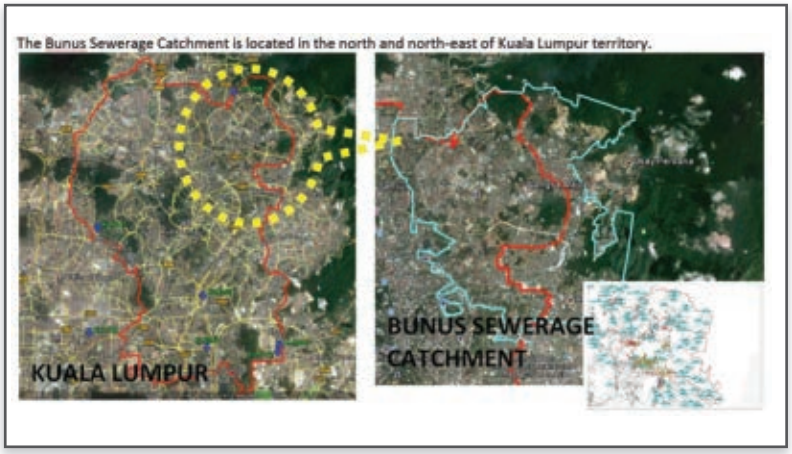
For this INR 4.5 billion project in Mandi, India, Frischmann Prabhu (India) Pvt. Ltd. delivered tender documents and construction drawings for all engineering planning and design based on the finalized master plan and architectural plans for a water supply system, sewerage system, stormwater drainage system, rainwater harvesting system, solid waste management system, sewage treatment plant, and water treatment plant.

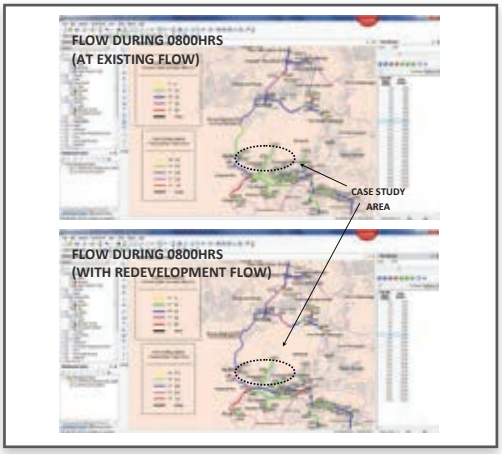
Frischmann Prabhu used WaterGEMS, StormCAD, and SewerCAD for the hydraulic design of the water supply distribution system, stormwater drainage system, and sewerage system. The software significantly reduced the man-hours required to perform the design, which resulted in faster delivery to all stakeholders and reduced project delivery time. Frischmann Prabhu submitted the tender documents and construction drawings ahead of project schedule.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

Indah Water Konsortium Sdn Bhd | Kuala Lumpur, Malaysia

Redevelopment in Bunus Catchment





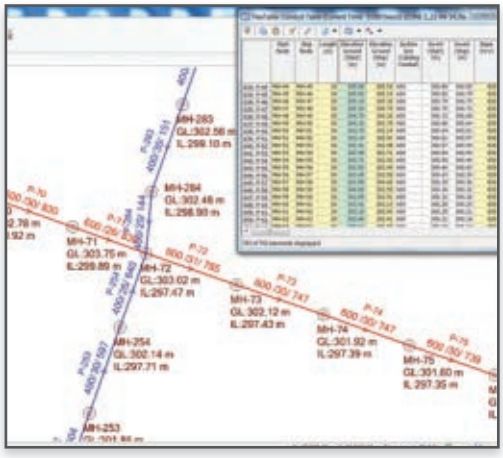
The goal of this MYR 26.5 million project in Kuala Lumpur, Malaysia, was to simulate the hydraulic condition of an existing sewerage system in the Bunus Catchment Area to determine whether it could handle growth proposed by local land developers. The design team needed to develop a hydraulic model of the Bunus Catchment Area, then execute a series of studies to evaluate current and future capacity needs and necessary upgrades to meet future demands.

Indah Water Konsortium used SewerCAD to determine whether the capacity of the current sewer system was sufficient to handle added capacity. This effort also helped the planning team prioritize the stretch of sewer that needed to be upgraded. SewerCAD helped the company significantly reduce engineering and planning time through automated design and scenario management that produced immediate results.

L&T Construction | Raipur, Chhattisgarh, India

Development of Sewerage Collection, Treatment, and Reuse



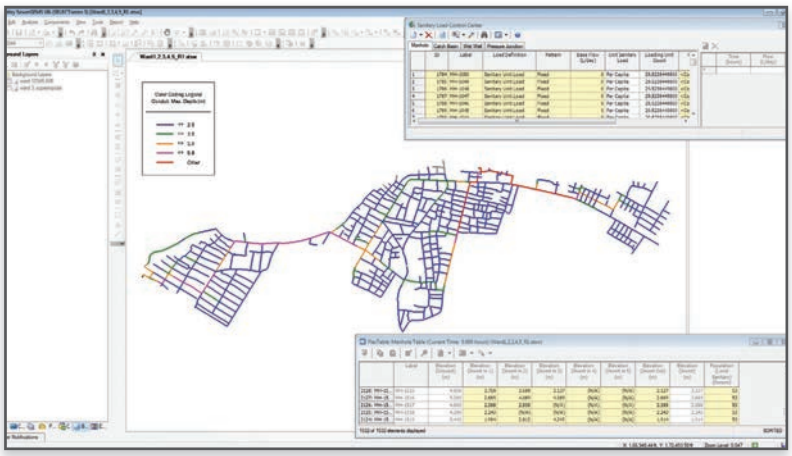


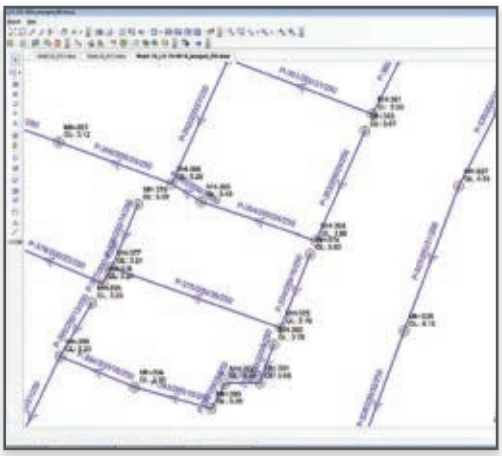
The goal of this INR 1.6 billion project was to survey, investigate, design, supply, install, test, and commission 77 kilometers of sewerage collection networks in Raipur, India. The network diameters ranged from 250 millimeters to 1,000 millimeters, with manhole depths ranging from 1 meter to 6 meters. To reduce the delivery time and project cost, the design team created an optimized design using technological innovation that increased productivity.

Using SewerGEMS, L&T Construction modeled the network while taking into consideration existing and future sewerage conditions. Since the project required close coordination among the mechanical, civil, and electrical departments, the real-time, interoperable exchange of data helped to significantly reduce the design time. Faster design and analysis processes reduced the project design time by almost 10 percent.

L&T Construction | Kolkata, West Bengal, India

Development of Sewerage Network and Wastewater Treatment Facility for Kalyani



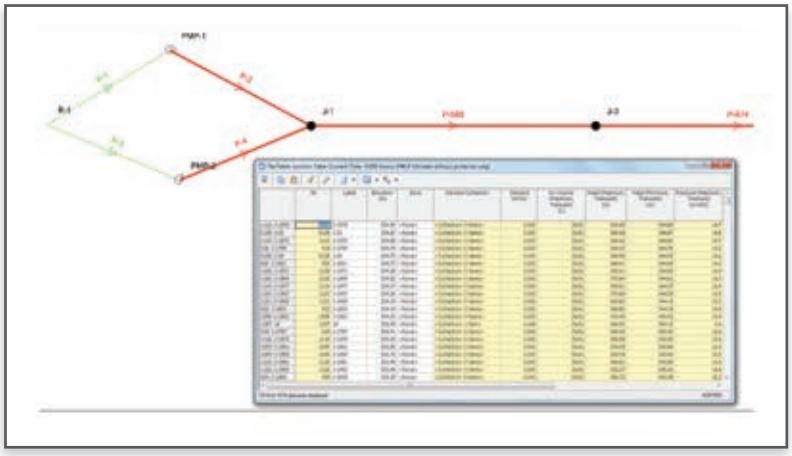


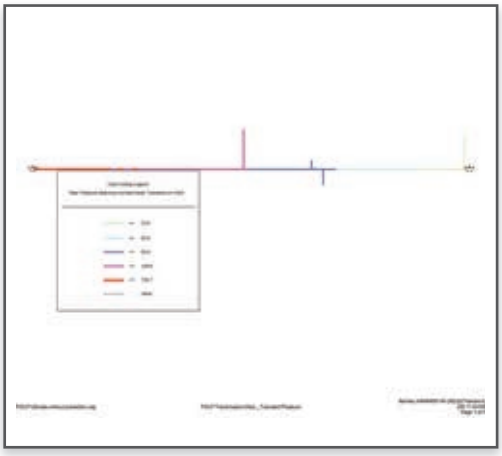
This INR 1.21 billion project consisted of a new sewer network that integrated with existing infrastructure by rehabilitating old sewers throughout the Kalyani area of Kolkata, India. Pumping stations were proposed that would collect and pump the sewage to the existing facilities, while treatment of the influent was augmented once at its destination. Different scenarios were simulated and ultimately reduced the project cost and enhanced productivity.

L&T Construction imported AutoCAD survey drawings into SewerGEMS, and the information was synchronized for analyzing and optimizing the network design. Extreme/peak flow patterns in SewerGEMS helped in restricting maximum depth of sewer, thereby rezoning the system. The scenario option in SewerGEMS helped the team calculate a number of what-if analyses with the network, which would have been tedious to carry out manually.

L&T Construction – Water and Effluent Treatment | Laxmangarh to Fatehpur, Rajasthan, India

Laxmangarh-Fatehpur Water Supply Project





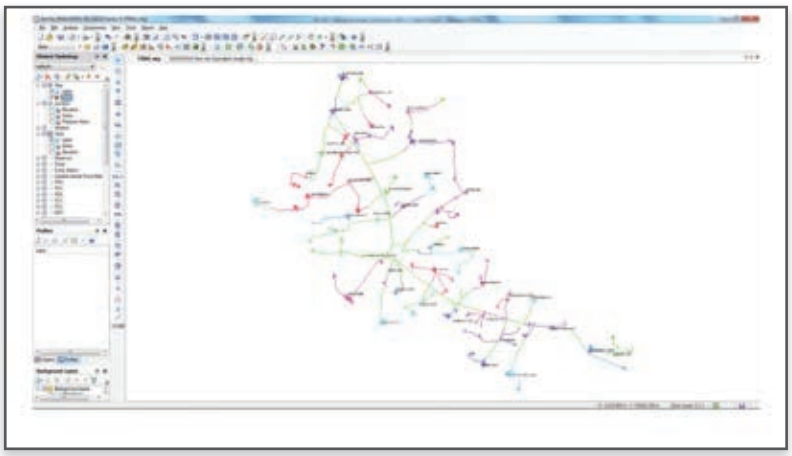
The comprehensive surge analysis of water transmission mains for the Laxmangarh-Fatehpur area in India was carried out by simulating various triggering conditions and proposing surge protection equipment. The ultimate goal of this INR 1.52 billion project was to design and execute a system that could deliver 90.44 million liters per day (MLD), 73.67 MLD, and 43.06 MLD of treated water to various sectors.

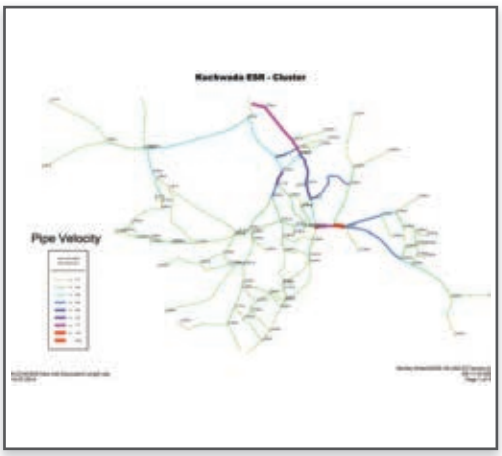
L&T Construction used WaterGEMS and HAMMER for the analyses. HAMMER enabled various surge protection systems to be analyzed and compared based on their effectiveness and risk reduction to the hydraulic transmission model. In the end, a combination of double-acting kinetic air valves was proposed as the most cost-effective solution, because it was able to keep the pressure values well within limits as required by India's regulatory board.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

L&T Construction – Water and Effluent Treatment | Udaipura, Madhya Pradesh, India

Udaipura Multi-village Rural Water Supply Scheme



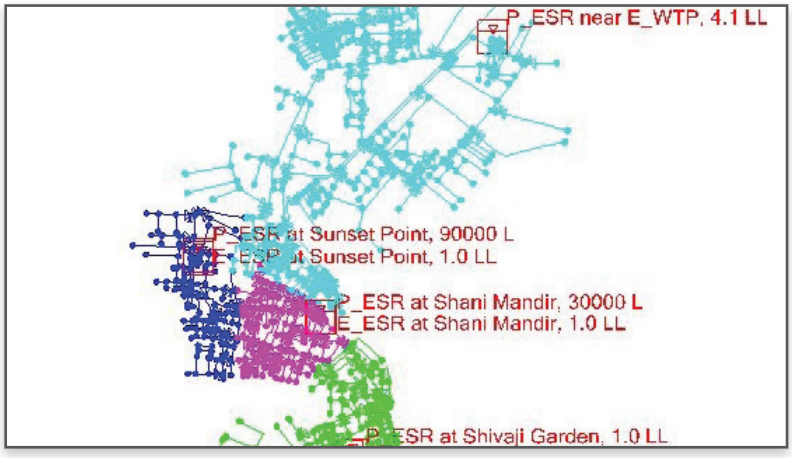


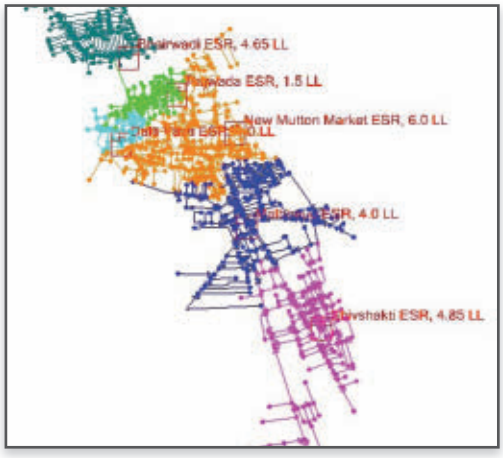
The challenge of designing this water supply network in Udaipura, India, was that the pipe lines needed to be installed on existing roads without an adverse effect on current traffic conditions or additional land acquisition by the government. The INR 1.54 billion project included an intake well, raw water rising main, water treatment plant, clear water pump house, clear water conveying main, 41 elevated service reservoirs, and respective distribution networks.

L&T Construction's use of WaterGEMS on this project, which will benefit about 160,000 residents by 2035, significantly reduced the time required to model the 41 hydraulic clusters and more than 5,000 pipes. This modeling phase took only two months compared to the 12 months or more it would have taken using traditional methods. The time reduction of 80 percent was attributed to the user-friendly interface and interoperability with other data formats.

Maharashtra Jeevan Pradhikaran | Maharashtra, India

Sustainable Water Supply Scheme for Municipal Councils



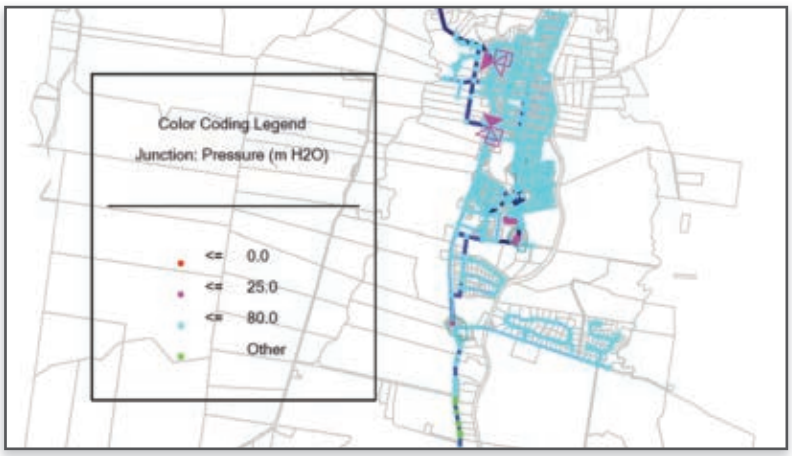


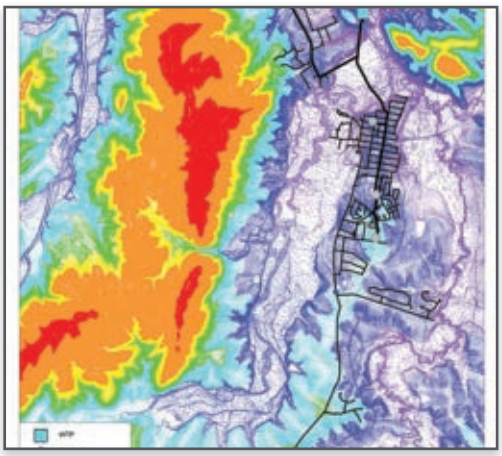
Fresh water is a renewable resource, yet the world's supply of groundwater is steadily decreasing, most prominently in India and Asia. The Government of Maharashtra has funded municipal councils in the state to increase serviceability and availability of water supply systems. These projects in Georai, Igatpuri, Jawhar, and Kurundwad, India, included consumer surveys, water audits, energy audits, flow meter installation, GIS development and mapping, and hydraulic modeling.

For these projects, ranging in cost from INR 900,000 to 30 million, Maharashtra Jeevan Pradhikaran worked with the municipal councils to implement accountability mechanisms for water theft and leakages, and to promote equitable distribution of water to all residents. Using WaterGEMS and its Darwin Designer module, the team prepared the water pipe network model from GIS files and performed extended-period simulations.

MidCoast Water | Gloucester, New South Wales, Australia

Gloucester Water System – Transforming the Customer Experience with an Optimized Water Distribution Strategy



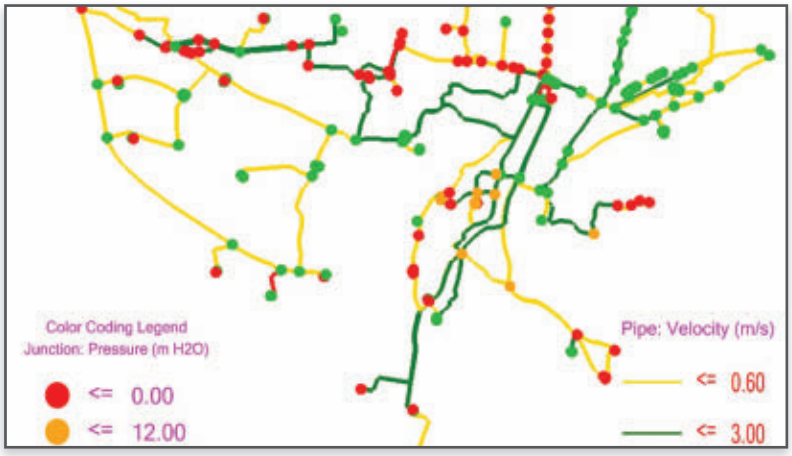


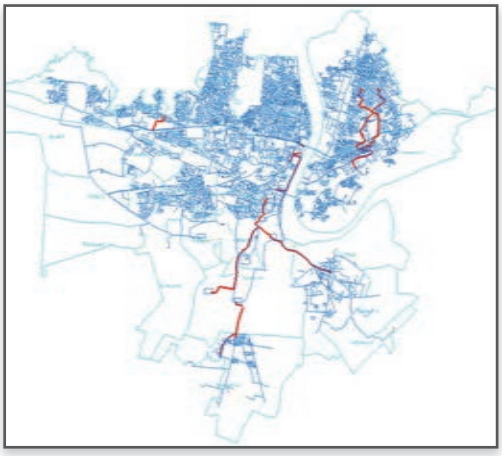
The goal of this AUD 8.1 million project was to provide Gloucester, Australia, residents with adequate and reliable water services. With elevation differentials of more than 60 meters, the Gloucester water network spanned more than 15 kilometers. The wide range of elevations and the system layout meant that a single large reservoir to service the entire region was not feasible. A solution was needed that would reduce the water system's reliance on booster pumps.

MidCoast Water used WaterGEMS to develop a hydraulic model of the existing system and to simulate over 100 scenarios, from which it selected a sustainable solution based on modeled pressures experienced by residents, pipe velocities, capital expenditures, and ongoing operational and maintenance costs. Once the system improvements have been implemented, the annual operational and maintenance costs will be reduced by more than 75 percent.

NJS Engineers India Pvt Ltd. | Agra, India

Water Supply Improvement Scheme for Agra City





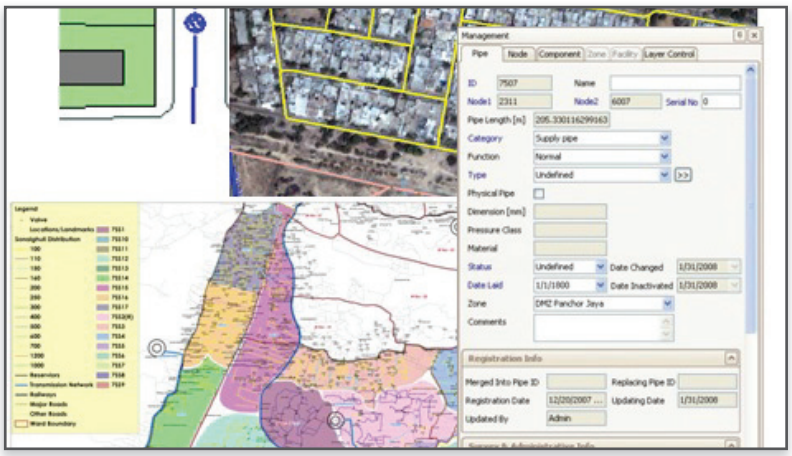
The absence of fresh water inflow and discharge of pollutants from the cities upstream of Agra, India, resulted in a severe state of pollution of the Yamuna River, the source of water for Agra and the river on which it is situated. The goal of this INR 400 billion project was to combine two sources of river water, the Yamuna River and the Ganga River, by rehabilitating existing plants and constructing a new 144-milliliters-per-day water treatment plant at Agra.

NJS Engineers India used WaterGEMS to develop hydraulic models for the existing and proposed Agra distribution systems, evaluate the existing facilities in terms of flow and capacities, and review the pressures within the distribution area. The team used STAAD.Pro to design and review the structural engineering elements of the project. The centralized project database that included construction activities at multiple locations proved to be invaluable.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

NJS Engineers India Pvt Ltd. | Guwahati, Assam, India

Water Supply Master Plan for Guwahati Metropolitan Area





Guwahati is the largest city in Assam, serving as the gateway to northeastern India. The public water supply within Guwahati covered only about 30 percent of the city, and also experienced high water leakage and severe availability restraints. The goal of this INR 180 billion project was to construct waterworks facilities in four sectors of the city that will deliver piped filtered water for 100 percent of the Guwahati population by 2025.

Using WaterGEMS, NJS Engineers India reviewed the hydraulic models and provided recommendations to the contractors. The high-pressure concerns in the distribution network were addressed by installing pressure-reducing valves or break-pressure tanks in the system, which entailed minor modifications in the pipe network. WaterGEMS was used to identify and rectify high-pressure issues cost effectively.

Sabesp | São Paulo, Brazil

Improvements in Anhangabaú Sewer Collection System



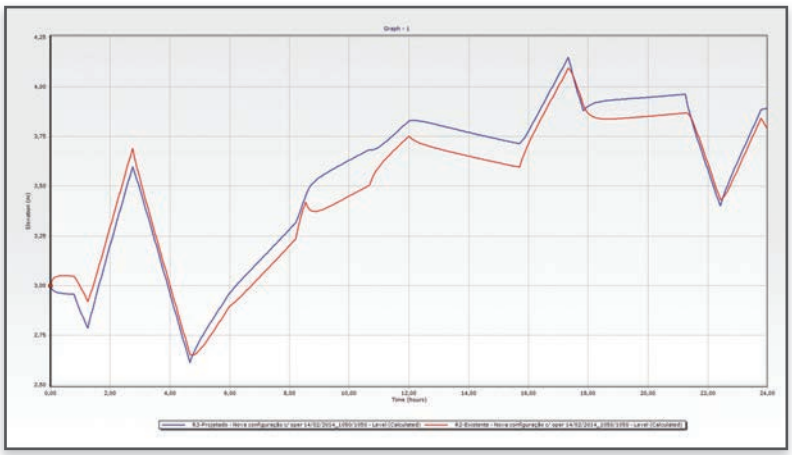


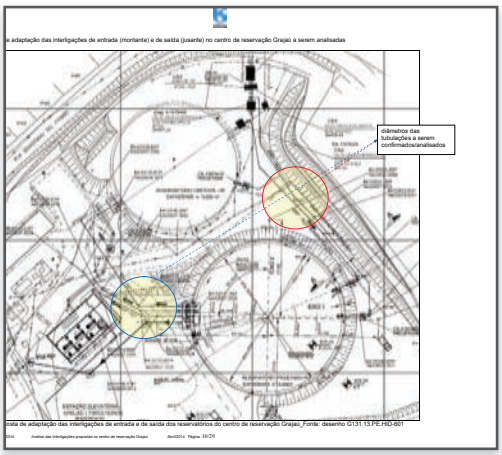
This project in São Paulo, Brazil, encompassed the region bounded by the sewer basin of Vale do Anhangabaú, which had experienced such rapid urban growth that underground sewage infrastructure had become damaged. The fear was that the networks would not be able to handle increased sewerage flow and overflow various sections of the basin, which would be a disaster since there were no valves to control the sewerage flow along the lines.

Sabesp used SewerGEMS for the hydraulic modeling of the entire sewer network, which provided elaborate simulations that would have taken months using traditional methods. Simulations were prepared for various scenarios to demonstrate that the improved system would be able to meet demand in even the most extreme conditions. The estimated project cost was BRL 30 million, but the actual cost to implement was BRL 5 million.

Sabesp | São Paulo, Brazil

Linking New Tanks to a Metropolitan Water Main System



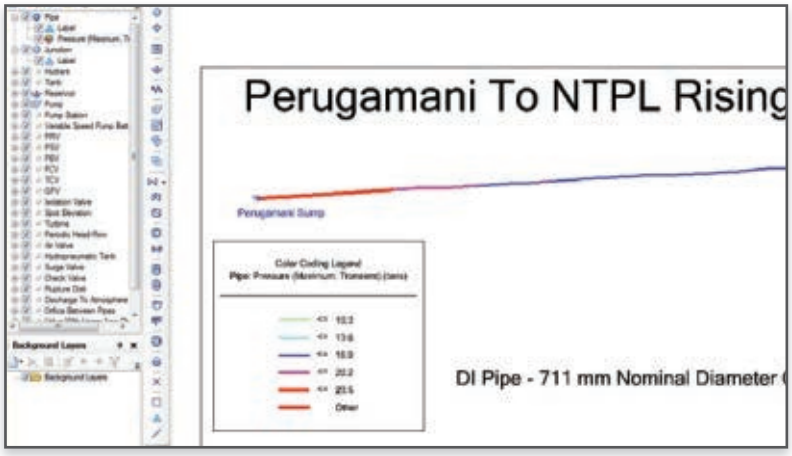


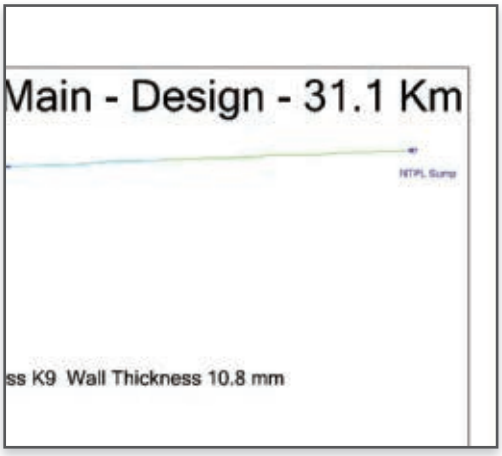
The goal of this BRL 55 million project was to create an integrated metropolitan water system. The Parelheiros reservoir supplies water to 450,000 inhabitants of São Paulo, Brazil. The Grajaú reservoir consists of a circular tank and two water booster stations – one for the upper zone and a newer one for the Parelheiros reservoir.

Sabesp used WaterCAD for the hydraulic analysis of the two water supply networks. WaterGEMS significantly reduced the time spent obtaining data from the field. The data was transferred to the main office through SCADA and GIS. Because both systems interfaced with WaterGEMS, operational data, water demand, and cadastre information were loaded in the hydraulic model instantaneously.

Tamil Nadu Water Supply and Drainage Board | India

Perugamani to NTPL Rising Main





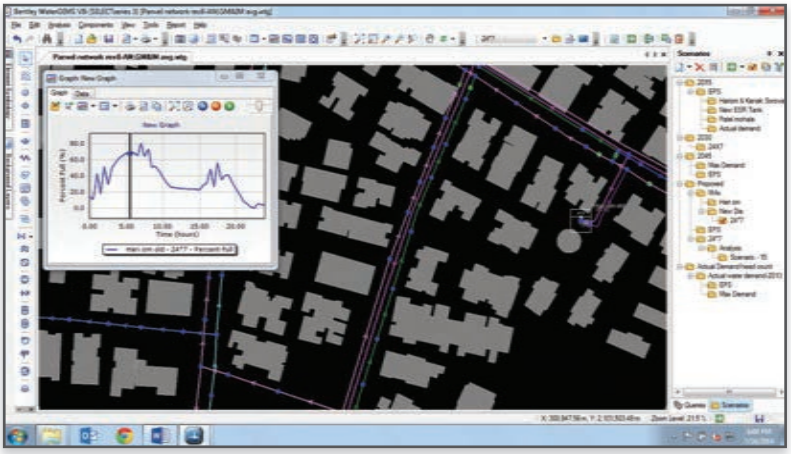
This INR 300 million project designed and constructed a 31-kilometer pipeline from the Perugamani region in India to an NTPL rising main (force main). The goal was to complete the design with no engineering inaccuracies that would have to be corrected in the construction phase of the pipeline. The challenge was the varied topography and the need to maintain optimum water pressure during the water pipeline construction.

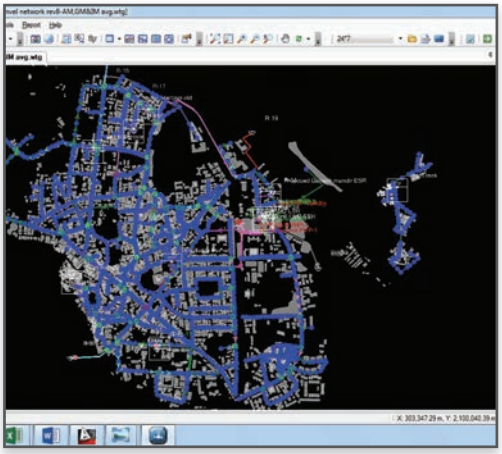
The Tamil Nadu Water Supply and Drainage Board used WaterGEMS to model the hydraulic distribution system using advanced interoperability, geospatial model building, optimization, and asset management tools. HAMMER was used to identify, manage, and mitigate the risks associated with transients. Project delivery time was reduced by 30 percent, project delivery costs were reduced by 20 percent, and operational costs were reduced by 20 percent.

Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis

Yash Engineering Consultants Pvt. Ltd. | Navi Mumbai, Maharashtra, India

Hydraulic Modeling and Capital Works for Panvel Water Supply Scheme





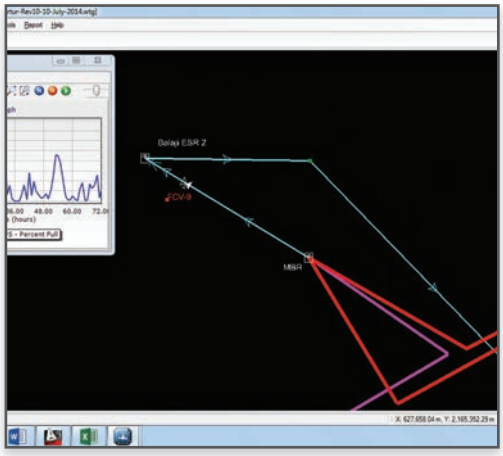
The goals of this INR 387 million project in Navi Mumbai, India, were to evaluate the existing water distribution system, determine whether it was sufficient to cater to existing demand as well as future demand, pinpoint the areas of improvement needed to meet future demand, and remodel designated areas as necessary for the 24x7 supply system for Panvel municipality.

Yash Engineering Consultants used WaterGEMS to identify the bottleneck and upgrade the existing water distribution infrastructure to increase its efficiency by reducing water loss from 40 percent to 10 percent or less. WaterGEMS' interoperability with GIS and AutoCAD was key to gathering information and quickly producing a water model. Significant time was saved by not having to manually enter data into conventional design software.

Yash Engineering Consultants Pvt. Ltd. | Partur, Maharashtra, India

Partur Water Supply System





The Partur region is a rapidly growing area of India. A proposed new water supply system needed to be designed to last for at least 30 years and have the capacity to handle future demands. Due to its current low population, however, it was necessary for the project to proceed in phases. The goal was to upgrade the existing water infrastructure to increase operational efficiency by reducing water loss and improving service levels.

Yash Engineering Consultants used WaterGEMS on this INR 396 million project to determine if a phase-approach to construction was feasible by simulating existing and future scenarios. WaterGEMS enabled the team to determine whether the existing system was sufficient for existing demands as well as future demands by running the model in both steady state and extended period simulation.



Innovation in Water or Wastewater Treatment Plants

Common goals of water resource professionals include increasing efficiencies in engineering processes while minimizing environmental consequences, preserving public capital investment, and enhancing the level of service of costly but necessary water infrastructure. This award category features projects that demonstrate the innovative use of technology to plan, design, manage, model, construct, and operate water and wastewater treatment plants.

Innovation in Water or Wastewater Treatment Plants

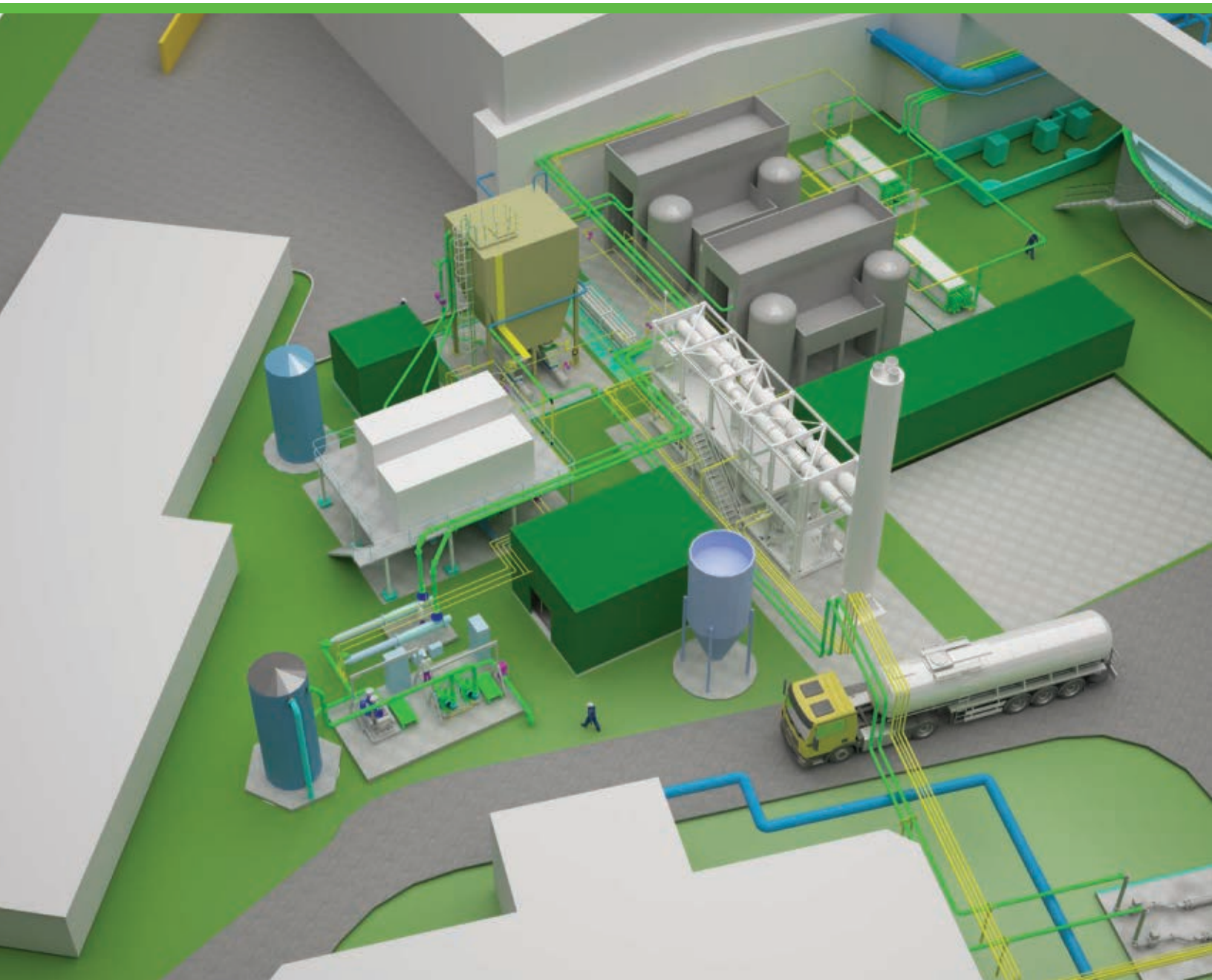
WINNER

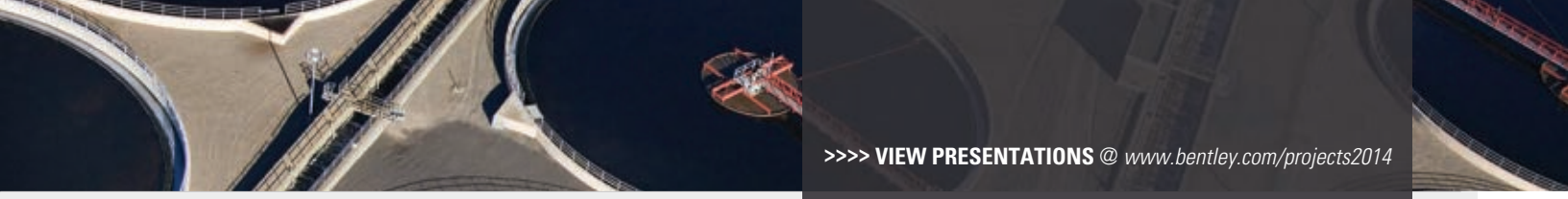
MWH | Edinburgh, United Kingdom

Seafield Wastewater Treatment Works Thermal Hydrolysis Plant

The primary goal of MWH's GBP 14 million Seafield Wastewater Treatment project was to enhance treated sludge prior to its entering the digestion system. The technology being used is thermal hydrolysis, which increases biogas production and sludge dewaterability. By feeding the biogas into the site's combined heat and power systems, the facility, which is owned by Stirling Water, became one of the first plants in Europe to be virtually energy self-sufficient. In addition, because it produces a pasteurized sludge that is 99.99 percent pathogen free, the plant can distribute its sludge for agricultural use rather than landfill.

MWH used AECOsim Building Designer, AutoPLANT, MicroStation, Bentley Navigator, Bentley OpenPlant, and ProjectWise. The OpenPlant 3D model enabled MWH to provide collaboration among the process pipework fabricator, odor control supplier, and cable-routing subcontractor. Sharing the pipework model allowed MWH to change how it approved detailed pipework – from issuing and checking drawings to reviewing changes electronically. Moreover, the integration of OpenPlant with Oculus Rift virtual reality head-mounted displays made it easy to spot clashes prior to construction, and allowed operations and maintenance to be immersed in the model during design review.





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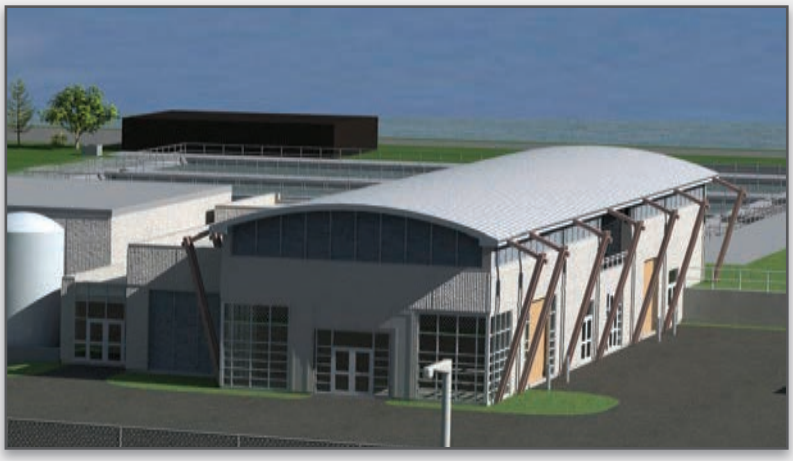
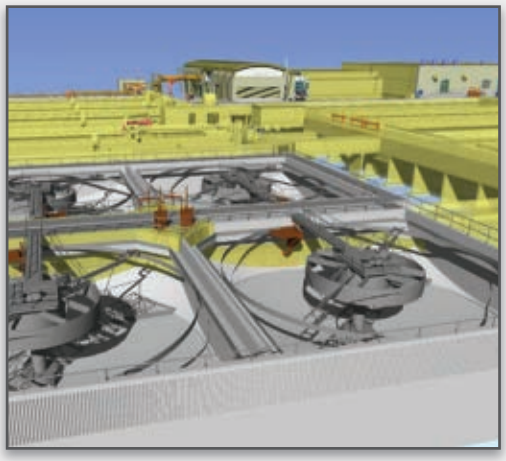




FINALIST

CH2M HILL | Burlington, Ontario, Canada

Skyway Wastewater Treatment Plant Phase II Expansion

The Skyway Wastewater Treatment Plant in Burlington, Canada, provides wastewater treatment for approximately 180,000 people. The goal of this CAN $158 million project, which is part of the Green Infrastructure Fund program to improve the environment and lead to a sustainable economy, was to return 140 million liters of treated water per day (MLD) back into the environment, up from the current operating capacity of 118 MLD.

CH2M HILL managed all data and information using ProjectWise within a BIM environment consisting of AECOsim Building Designer, Bentley Descartes, InRoads, MicroStation, Bentley Navigator, Bentley OpenPlant, Bentley PlantSpace, and Bentley Raceway and Cable Management. This ensured consistency across the project so that models shared a common data definition across the more than 13 facilities and underground network of piping and utilities.





FINALIST

Zhongnan Engineering Corporation Limited | Qingzhen, Guizhou, China

3D Collaborative Design Accelerates Industry Revolution – The Standardized Design and Application of Water Project

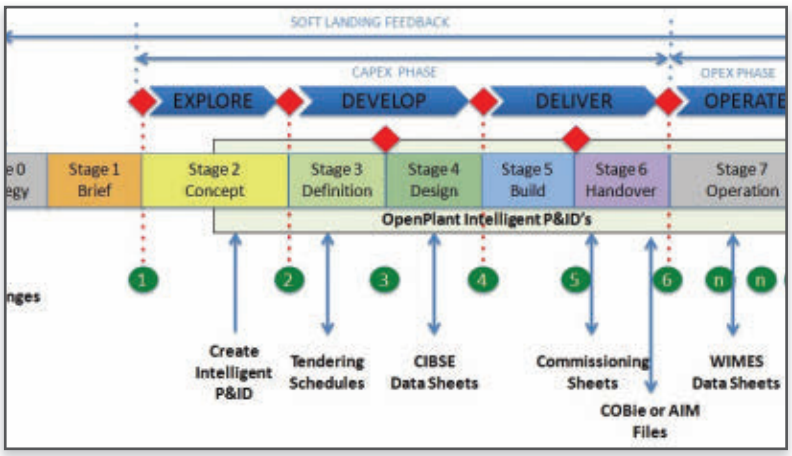
With rapid urban development that attracts heavy investment in urban infrastructure construction each year, China has received close to CNY 2 trillion in investments for water pollution control plants. The Qingzhen Vocational Education West District sewage treatment plant was implemented using a standardized design system for water projects, which reduced design time by 35 percent and design costs by 30 percent.

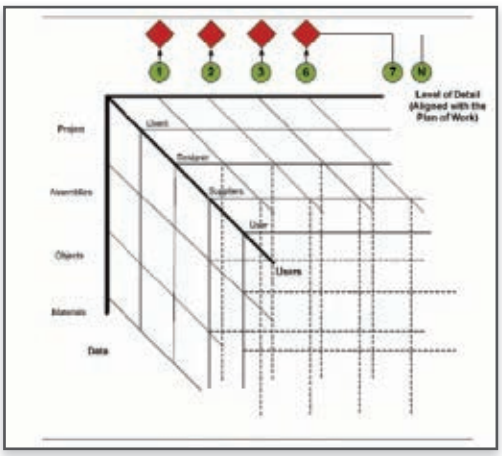
Using AECOsim Building Designer, GEOPAK, MicroStation, Bentley Navigator, Bentley OpenPlant, ProjectWise, and Bentley Substation, Zhongnan Engineering Corporation Limited integrated the design, construction, and operations of a project that yielded a long-term return from a small, one-time investment. This successful sewage treatment plant project will now serve as the template for subsequent work on 14 other water projects.

Innovation in Water or Wastewater Treatment Plants

Black & Veatch | United Kingdom

UK BIM – The Integral Role of the Intelligent P&ID Within the Digital Plan of Works



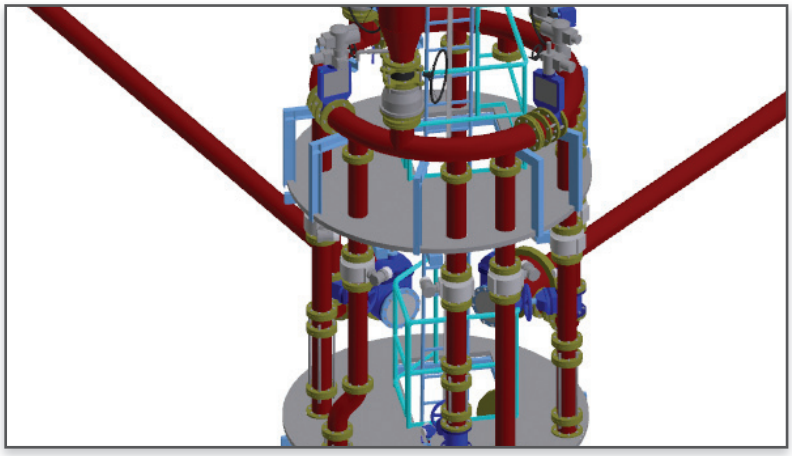


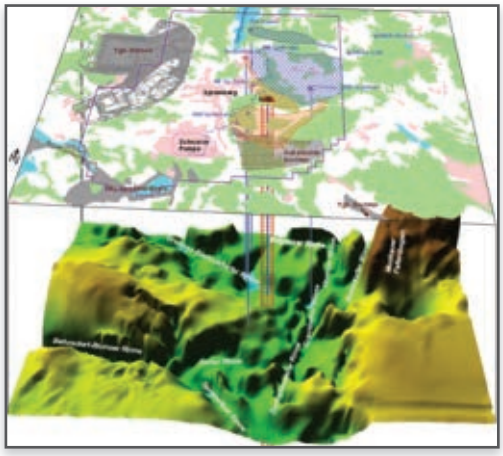
The goal of this project in the United Kingdom was to implement an effective and lean engineering design, construction, and asset management methodology across project lifecycles. The challenge was mapping the asset attribute data requirements to the digital plan of works and linking intelligent P&ID tools/technology to the design and construction BIM process inputs and outputs.

Using Bentley OpenPlant PowerPID, Black & Veatch captured and enhanced data as it moved through the creation and delivery process, so that meaningful data was delivered to the operations and maintenance team in the correct formats and to the required level of definition. This approach actively promoted sustainable data management strategies by supporting a well-defined BIM methodology that dramatically reduced the amount of checking and review.

UBV Umweltbüro GmbH, Vermessungsbüro Keßler und Puggel, and cadcom Systemhaus GmbH | Berlin, Germany

Horizontal Filter Wells Design Experiences, 3D Surveys, and Visualizations





The ultimate goal of this joint project in Berlin, Germany, was to create an engaging film presentation of the project. Targeted at decision makers and the general public, the film's purpose was to educate technical and non-technical audiences on the scientific and environmental aspects of how to protect cities, localities, and districts from a rising water table.

UBV Umweltbüro GmbH, Vermessungsbüro Keßler und Puggel, and cadcom Systemhaus GmbH used MicroStation and Bentley Navigator to plan and survey the 3D horizontal filter wells. MicroStation was critical to the loading of point clouds and provided animation and visualization capabilities. The final video became a bridge of knowledge for both design specialists and the community at large.



2014 *Be Inspired* Awards Jurors

Representing independent experts from around the world in various fields of infrastructure, this well-rounded group has volunteered wisdom, critical assessment, and enthusiasm for the difficult task of choosing the best among the best.

About the 2014 *Be Inspired* Awards Jurors



Kevin Baxter | Energy and Industries Editor, *MEED*

Kevin Baxter is energy and industries editor at *MEED*, which has been providing business intelligence for the Middle East since 1957. He has covered the energy sector in the Middle East for the past five years and worked as a business journalist for *The Times* of London.

Baxter's key sectors that he covers include hydrocarbons, petrochemicals, metals and mining, and general manufacturing. He also covers the global energy and petrochemicals markets, chairs hydrocarbons conferences for *MEED*, and writes about Saudi Arabian politics and economics.



Alison Premo Black, Ph.D. | Senior Vice President & Chief Economist, American Road & Transportation Builders Association (Washington, D.C.)

Dr. Alison Premo Black joined the American Road & Transportation Builders Association (ARTBA) in August 2000. She serves as senior vice president and chief economist for ARTBA, and deputy managing director of the contractors division and oversees the Transportation Investment Advocacy Center program. Dr. Black manages ARTBA's contractor chapter relations and membership development activities.

Dr. Black and her economics team are responsible for over 70 studies examining national and state transportation funding and investment patterns, including the association's landmark economic profile of the transportation construction industry, state bridge condition profiles, and annual modal forecast. She completed her Ph.D. in economics at George Washington University and holds an M.A. in international economics and Latin American studies from the Johns Hopkins School of Advanced International Studies (SAIS). Dr. Black graduated magna cum laude from Syracuse University.



Tony Christian | Director, Cambashi

Tony Christian brings to Cambashi wide-ranging experience in engineering, manufacturing, energy, and IT. His early career was in technical R&D roles, after which he moved into computer-aided engineering. Christian's subsequent roles included divisional head of the IT subsidiary of a major international engineering and construction company and leadership of teams developing and implementing state-of-the-art manufacturing control systems at British Aerospace. More recently, Christian was a director of the U.K. Consulting and Systems Integration Division of Computer Sciences Corporation (CSC), where he led a consulting and systems practice for manufacturing industries. He was also services and technology director at AVEVA Group plc, where he was responsible for all product development and the company's worldwide consulting and managed services business.

Christian has a B.Sc. degree in mechanical engineering and an M.Sc. degree in engineering acoustics, noise, and vibration from the University of Nottingham.



Laura Cornish | Editor, *Mining Review Africa*

Laura Cornish is editor of *Mining Review Africa*. Since earning an honours degree in journalism in 2004, she has developed a sound understanding of the entire mining value chain and edited some of South Africa's most prestigious mining trade publications. Cornish has visited mines on nearly every continent and has earned several publishing excellence awards for her work as a journalist and editor covering the mining industry.



Paul Curtis | Journalist, Rail Media Group

Paul Curtis works on 10 different rail brands for Rail Media Group, including *RailStaff, The Rail Engineer, Global Rail News, RailwayPeople.com, Rail Executive Club, Rail Safety Summit, Rail Staff Awards, Rail HR Awards*, and www.raillive2014.com, the largest live railway exhibition in the world.

He spent seven years in recruitment and seven years in advertising before returning to Oxford to study strategic and tactical marketing. Curtis joined Telent (formerly Marconi) in 2008, becoming sales and marketing manager with the Rail Alliance in 2009. Through his efforts, he grew the Rail Alliance to 225+ new members in just three years by teaching members how to network, innovate, and collaborate through "show, tell and ask" pitches and by organizing monthly networking sessions on railway station platforms.



Tony Duboudin | Editor, *Track & Signal*

Tony Duboudin is a widely experienced news journalist who has worked in Australia, the United Kingdom, and France for daily newspapers as well as for a major international news agency. For the past five years, he has concentrated on the railway industry as editor of *Track & Signal*, a magazine for Australasia railway professionals based outside Melbourne.

Before taking up the position as editor of *Track & Signal*, Duboudin was a senior journalist with *The Age* newspaper in Melbourne. Additionally, he worked for *The Times* in London (and later in Australia as the newspaper's correspondent) and in public relations for a major Australian regional airline. Earlier in his career, he also ran a small boutique PR agency and worked for United Press International in Paris. Tony has had a love affair with the rail industry dating back to his childhood when he remembers going to France via the ferry after a steam train journey to Dover.



Joe Francica | Editor-in-Chief and Vice Publisher, *Directions*

Joe Francica is editor-in-chief of *Directions* magazine and vice publisher of Directions Media. He is responsible for operations of the publishing group. In 2013, following a survey by Boundless, Francica was named one of the top 25 most influential people in geospatial technology. He has written extensively on topics related to location intelligence and analytics, location-based services, augmented reality, and the use of geographic information system (GIS) technology for business applications.

Francica was appointed director of GEO Huntsville (Alabama) in 2012 by Mayor Tommy Battle. GEO Huntsville is an economic development initiative focused on geospatial technology. In 2011, along with colleagues at Penn State University, he developed an online course entitled "Location Intelligence for Business" for the university's online GIS curriculum. Francica has served on the National Visiting Committee for the National Science Foundation-funded GeoTech Center and supported the development of the Geospatial Technology Competency Model for the U.S. Department of Labor.

About the 2014 *Be Inspired* Awards Jurors



Tom Freyberg | Chief Editor, WWi, PennWell International

Tom Freyberg, an experienced environmental journalist at PennWell International, has held positions across a variety of business-to-business titles. In addition, he has had articles and comments published in national newspapers, including *The Times* and *The Guardian*, and on CNN. Freyberg has been invited to speak at several international conferences, including the World Conference of Science Journalists in Helsinki, Finland. He earned a bachelor's degree in English from Exeter University and completed his PMA journalism training in London. Freyberg joined PennWell in January 2010.



Gerry George C. Eng. MIET | International Editor, *Transmission and Distribution World*

Gerry George has been the international editor of *Transmission and Distribution World*, a magazine targeting senior staff in power delivery utilities, since 1996. A chartered engineer and member of the Institution of Engineering Technology prior to this editorial position, he spent more than 30 years in the U.K. electricity supply industry. George joined an energy consultancy, British Power International, in 1996 where he has been engaged on a number of major contracts for transmission and distribution utilities in the Philippines, Dubai, Bahrain, and Abu Dhabi.



Mark Hansford | Editor, *New Civil Engineer*

Mark Hansford is editor of *New Civil Engineer* (NCE), a global brand that delivers award-winning content online, on tablet, in print, and through live events such as awards, conferences, roundtables, and webinars. As editor, he is spearheading the transformation of NCE magazine from a print-based magazine to a digital publication.

Hansford has 20 years of experience in civil engineering as a practicing, qualified engineer, and 13 years of experience as a journalist with NCE, winning numerous awards. His background includes five years serving as content/deputy editor responsible for providing news coverage for the weekly magazine and the daily news service. Hansford received the IBP News Reporter of the Year in 2003 and the Construction/Infrastructure Writer of the Year in 2013.



Keith Hayward | Editor, *Water21*

Keith Hayward is the editor of *Water21*, the magazine of the International Water Association – a leading global network of water sector professionals. He has edited *Water21* since the association was created by the merger of two long-standing water sector organizations in 1999. Hayward is also editor of *Water Utility Management International* and the *IWA Yearbook*, and has worked on and edited other water-sector publications. He holds a master's degree in international water law.



Andrew Hobbs | Group Editor, Energy Publications

Andrew Hobbs is Group Editor of Energy Publications – serving as editor of *Oil & Gas Australia*, Australasia's leading oil and gas journal, as well as *Oil & Gas Asia*, *PNG Resources,* and *Asia Pacific Subsea World*. He has worked as a journalist for eight years and specialized in reporting on the oil and gas industry for four years. Hobbs was an online journalist and sub-editor for *Upstream*, the international oil and gas industry newspaper. Hobbs holds an honours degree in political science from the University of Western Australia and a graduate degree in journalism from Curtin University of Technology.



Erin Joyce | Managing Editor, *Engineering News-Record*

Erin Joyce is managing editor for integrated media with *Engineering News-Record* (ENR), where she oversees content produced for the ENR enterprise. She also leads the technology vertical for the publication and its events, as well as writes about IT issues for engineering and construction. Her work focuses on apps, 4D BIM and scheduling tools, software-as-a-service (SaaS), platform-as-a-service, Web services, and cloud computing.

Prior to joining ENR, Joyce covered enterprise technology for various publications, including *American Banker*, *Jupitermedia*, *InternetNews.com*, and *BusinessWeek*. She holds a master's degree from Columbia University's Graduate School of Journalism and an undergraduate degree from the University of Maine.



Felix Mara | Architect

Felix Mara is a chartered architect who specializes in external envelope and conceptual design. He has practiced in London, Bath, Tokyo, and Hong Kong, acquiring broad digital architectural design experience. From 2009 to 2014, Mara was technical editor of *The Architects' Journal* and editor of *AJ Specification*. He was also the editor and main contributor to *Architects Working Details 8* (AJ, 2014) and the technical volume of *Zaha Hadid Architects: Heydar Aliyev Center* (Lars Müller, 2014). In August 2014, he returned to architectural practice, joining GRID Architects in London.



Leesa Nacht | Associate Publisher, *Plant Engineering & Maintenance* and *Resource Engineering & Maintenance*

Leesa Nacht is the associate publisher of *Plant Engineering & Maintenance* (PEM) and *Resource Engineering & Maintenance* (REM) magazines. She has been working in this industry for eight years. PEM is Canada's largest publication devoted to maintenance, reliability, and asset management. Nacht is an active member of the Plant Engineering & Maintenance Association of Canada, and a member of the judging panel for the PEM Maintenance Awards, a national award in Canada celebrating excellence in maintenance and reliability in the industrial manufacturing, oil and gas, and mining sectors.

About the 2014 *Be Inspired* Awards Jurors



Terrence O'Hanlon | Publisher, *Reliabilityweb.com*, *RELIABILITY Magazine*, and *Uptime Magazine*

Terrence O'Hanlon, CMRP is the publisher of *Reliabilityweb.com*, *RELIABILITY Magazine*, and *Uptime Magazine*. He is certified in asset management by the Institute of Asset Management and a certified maintenance and reliability professional by SMRP. O'Hanlon is the acting executive director of the Association for Maintenance Professionals (AMP), and the executive editor and publisher of the *Asset Management Handbook*, 5th Edition.

He is a member of the Institute of Asset Management, American Society of Mechanical Engineers, the Association of Facilities Engineers, Society of Maintenance and Reliability Professionals, and the Society of Tribologists and Lubrication Engineers.



Antony Oliver | Editor, *Infrastructure Intelligence*

Antony Oliver is the editor of *Infrastructure Intelligence*. He spent the past two decades covering civil engineering and infrastructure with *New Civil Engineer* magazine. Oliver is a chartered civil engineer and Fellow of the Institution of Civil Engineers. He began his career as a design engineer with Owen William and Partners before joining Balfour Beatty. As editor of NCE Oliver was responsible for driving the magazine's portfolio of live events and conferences and, most recently, spearheaded the magazine's move from paper to digital. He is currently a member of the Green Construction Board's promotion working group, a judge for the British Construction Industry Awards and an active supporter of engineering disaster relief charity RedR.



Peter Reina | Europe Correspondent, *Engineering News-Record*

Based in London, Peter Reina reports on key technical and business developments in the broad infrastructure sector and tracks the global activities of European construction-related companies and institutions. Reina is an honours graduate in civil engineering from London University's King's College and an affiliate of the British Institution of Civil Engineers. His reporting for *Engineering News-Record* (ENR) and other publications has taken him to many countries across five continents.



Richard Roberts | Editor-in-Chief, *Mining Journal* and Managing Editor, Aspermont Media U.K.

Richard Roberts has been a mining and business journalist, editor, and publisher for more than 20 years and currently leads the Aspermont U.K. media group out of London, where he is also editor of *Mining Journal*, the world's leading global weekly mining publication. He has visited and written about mining projects all over the world, covering and analyzing the industry from both an investment and technical standpoint. A winner of mining media awards in Australia, where his publications and other editorial team members have also been recognized, Roberts has expanded his work to include high-level coverage of technology trends and the mining technology and services sectors in *HighGrade.net*, an Australian weekly e-magazine, and subsequently in *Mining Journal*. He has a strong interest in the increasing role of technology in "smarter mining."



Andrew Roscoe | Power & Water Editor, *MEED*

Andrew Roscoe is the Power & Water editor for *MEED*, based in Dubai, U.A.E. Roscoe joined *MEED* in February in 2010 as a construction reporter and has been the Power & Water editor since January 2013. He reports, analyzes, and comments on all aspects of the power and water sectors in the Middle East and North Africa, as well as the political economy of Kuwait.

In 2013, Roscoe wrote the *MENA Power Report* for *MEED's* research division, MEED Insight. The 250-page report provided analysis and forecasting for the power sectors across the region. He has an honours degree in politics and international relations from the University of Aberdeen, located in Scotland.



Helena Russell | Editor, *Bridge Design & Engineering*

Helena Russell is editor of *Bridge Design & Engineering,* the only international magazine focused on the bridge industry. She held this post for 16 years of her 20-year career working in business-to-business publishing. During this time, she expanded the brand to incorporate numerous additional printed publications and directories, a website, digital editions, and social media networks. Russell is the author of three books: one about the project management of the Oresund Fixed Link between Denmark and Sweden, and two company history books that focused on the U.K. contractor Cleveland Bridge and the U.S. consultant Hardesty & Hanover.

She started her career as a site engineer with Laing Civil Engineering before beginning a career in journalism with *New Civil Engineer* (NCE). Russell earned a degree in civil engineering from Imperial College, in London, U.K.



Tom Sawyer | Senior Editor, *Engineering News-Record*

Tom Sawyer covers information technology at *Engineering News-Record* (ENR), a news magazine and information resource for the global construction industry. Sawyer defines information technology broadly as any technology that helps make data useful for the design and construction of all types of facilities.



Monica Schnitger | President, Schnitger Corporation

Monica Schnitger is founder and president of Schnitger Corporation. She has been quoted in publications such as *Automotive Design and Production*, *Business Week Online*, *Forbes*, *Information Week*, *Mechanical Engineering*, *Wards Auto World*, and *Washington Technology*, and has appeared on American Public Media's *Marketplace*. Schnitger has more than 25 years of experience in engineering and CAD/CAM and has held positions as a senior vice president of market analysis at Daratech, in software development management at Computervision Corporation, and as an engineer at Bath Iron Works. She holds a bachelor's degree in naval architecture and marine engineering from the Massachusetts Institute of Technology and an honors M.B.A. from the F.W. Olin School of Management at Babson College.

About the 2014 *Be Inspired* Awards Jurors



Judy B. Skeen, P.E. | Contractor, American Association of State Highway and Transportation Officials (AASHTO)

Judy Skeen joined AASHTO as the AASHTOWare Bridge Software project manager in 2012 following a 30-year career with the Texas Department of Transportation. She holds a B.S. degree in civil engineering from Texas Tech University and is a registered professional engineer in Texas. Skeen's technical and management experience in the transportation field includes highway design, CAD, GIS, IT application development, IT infrastructure and operations, project development, and program management. She served as 2009 president of the Highway Engineering Exchange Program (HEEP) and is a member of the Texas Tech University Civil Engineering Academy.



Dick Slansky | Senior Analyst PLM & Industry, ARC Advisory Group

Dick Slansky's responsibilities at ARC include directing research and consultation in areas such as PLM, ALM, engineering design tools (for both discrete and process industries), factory floor architecture, and manufacturing enterprise architecture. He also provides technical consulting services for discrete manufacturing end users in the aerospace, automotive, and other industrial verticals. Additionally, he focuses on engineering design tools for process, energy, and infrastructure. Slansky holds a bachelor of science degree in mechanical engineering from the University of Kansas and a degree in computer science from Seattle Pacific University. He also holds a certificate in client/server project management from the University of Washington, in Seattle.



Peggy Smedley | Editorial Director, *Constructech*

Peggy Smedley is an internationally known, highly respected personality and speaker. She is the quick-witted host of *The Peggy Smedley Show*, the editorial director of *Constructech* magiazine and its sister publication, *Connected World* magazine, as well as the president of Specialty Publishing Co.

Smedley is the author of *Mending Manufacturing: How America Can Manufacture Its Survival*, which details all aspects of the American manufacturing crisis. In 1997, Smedley founded Specialty Publishing Co. with the goal of enlightening executives in key industries about the importance of understanding technology for the betterment of their companies. She successfully launched targeted publications while leading Specialty Publishing. Smedley earned a degree in journalism from Northern Illinois University, in DeKalb, Illinois.



Jeff Thurston, M.Sc. (GIS) | Founder and Editor, *3D Visualization World*

Jeff Thurston has written extensively about the use of spatial information hardware and software in a multi-disciplinary fashion. His current focus is upon advancing the use and application of 3D in the architecture, engineering, and construction (AEC) sectors; the use of 3D design and visualization in industry together with 3D simulation; and modeling for infrastructure performance. Thurston understands the use of geographic information systems (GIS) extensively, as well as their relationship to CAD-based design tools and applications. Interested in advanced spatial integraton that includes remote sensing, robotics, simulation, modeling, and design, his writing targets young entrepreneurs starting companies and businesses that wish to achieve new knowledge and value-added approaches. Thurston is a member of the Canadian Association of Journalists.



Bob Vavra | Editor, *Plant Engineering*

Bob Vavra is editor of *Plant Engineering* magazine, part of CFE Media. His 40-year career in journalism and media includes more than 25 years as a newspaper writer and editor in the Chicago area. Vavra has covered the retail petroleum, retail food, and safety industries before joining *Plant Engineering* as editor in 2005. He is a graduate of Illinois State University, a loyal White Sox fan, and has been a contestant on *Jeopardy!*



Mischa Wanek-Libman | Editor, *Railway Track & Structures*; Engineering Editor, *Railway Age*

As editor of *Railway Track & Structures* (RT&S) and engineering editor of *Railway Age*, Mischa Wanek-Libman reports on the engineering, construction, and maintenance side of North America's railroad industry. RT&S and *Railway Age*, along with *International Railway Journal*, make up The Railway Group at Simmons-Boardman Publishing. Wanek-Libman joined RT&S as assistant editor in 2001, before being named managing editor in 2008 and editor in 2010. She is originally from Grand Island, Nebraska, and earned a Bachelor of Arts degree in journalism and mass communication from Drake University in Des Moines, Iowa.



Geoff Weisenberger | Senior Editor, *Modern Steel Construction*

Geoff Weisenberger is the senior editor of *Modern Steel Construction*, the monthly magazine of the American Institute of Steel Construction. Weisenberger has also served as AISC's director of sustainability. He has more than 15 years of experience editing and writing for construction-related magazines and has written for various entertainment and cultural publications, including the Chicago edition of *Where*.



Paul Wilkinson | Director and Blogger, pwcom.co.uk Ltd

Paul Wilkinson has been working in the construction industry, predominantly in marketing and public relations, since 1987, with some of the sector's best-known names in professional services and information technology. He is also a leading authority on the use of construction collaboration technology platforms, software-as-a-service, and related developments in fields such as building information management, mobile technologies, and social media.



Pamela Wolfe | Editor-in-Chief, *World Water*

Pamela Wolfe has been editor of international publications that specialize in water and environmental issues for more than 25 years. Currently, she is the editor-in-chief of *World Water*, *World Water Chinese Edition, Water Reuse & Desalination*, and *Stormwater Management*, published by WEF Publishing U.K. Ltd., a U.K. subsidiary of the Water Environment Federation, a U.S. technical and education organization. Wolfe manages content development and production for four publications and is a frequent contributor of commentary articles, interviews, and features.

Index – Alphabetical By Organization

Organization Name			Project Name	Page
3DDraughting	W		LPG Import and Storage Terminal	110
3Deling Sp. z o.o.			Digitising Chemical Plant	112
ADG (D&C)			Swimming Pool at Pune	150
AECOM and Ferrovial Agroman			North Tarrant Express Segment 3A	134
AECOM India – Delhi Jal Board	F		Sewerage Master Plan – 2031 for NCT of Delhi	173
AECOM India Pvt. Ltd.			Delhi-Jaipur Greenfield Expressway	134
Afcons Infrastructure Limited			Barapulla Elevated Corridor Phase I and II	150
Afcons Infrastructure Limited			Cantilever Form Traveler	151
Afcons Infrastructure Limited			Erection Gantry for Precast Crash Barriers	151
AG5 Architects			Kildevælds School	36
Agrium Inc.	F		Agrium Vanscoy Potash Operations Reliability Improvement Project	21
AKATT S.A.			Automation Systems for Remote Control, Operation, and Water Leak Management	174
Aker Powergas Pvt Ltd			Process Structure for a Petrochemical Plant	152
AmerenUE			Design Change Revitalization Project	22
American Electric Power		SR	Bentley Substation and eB Implementation	10, 162
American Structurepoint, Inc.			Maplecrest Road Extension	135
Anhui Transport Consulting & Design Institute Co., Ltd	W		Second Wuhu Yangtze River Highway Bridge	26
Arabtec Construction LLC	F		Fairmont Hotel	49
Arup	F		Civil BIM Implementation for Campus Projects	67
Ashida Electronics			Control and Relay Panel for 132/33 kV	162
Aster Building Solutions Pvt Ltd			Navi Mumbai Metro Rail Station	152
Aurecon			Matthew 132/11 kV Substation	163
Ausenco	W		Constancia Project	78
Ausenco	F		Goldstrike	79
Ayuntamiento de Reus			Generation of 3D Maps for the City of Reus	58
Barcelona Regional S.A.	F		Sediment Balance of the Beaches of Barcelona	67
Barwon Water			Colac Water Hammer Analysis	174
Barwon Water			Water Quality Modelling	175
Bashgiproneftekhim SUE			Warehouse of Spent and Fresh Catalysts	50
Bechtel	F		Vauxhall Underground Station: Congestion Relief and Step-free Access Project	119
Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences	W	SR	Five-hundred-meter Aperture Spherical Radio Telescope (FAST)	13, 148
Beiswenger, Hoch and Associates, Inc.			I-595 Reversible Lanes	28
Beiswenger, Hoch and Associates, Inc.			Spanish River Interchange Improvements	28
BIPROWODMEL Sp. z o.o.			Rainwater and Meltwater Management	175
Black & Veatch			UK BIM – The Integral Role of the Intelligent P&ID within the Digital Plan of Works	190

Winner Finalist Special Recognition Award Winner

Organization Name		Project Name	Page
Bogle Architects		Beijing Green Building Park Visitor Center	36
Bos Constructie V.O.F.		Steel Construction for Bouwservice Liempde Building	153
Bristol Water		Mapping the Works	163
Bühler Group		A Worldwide Bühler Engineering Network	120
Byggnadstekniska Byrån i Stockholm AB		Fondbyggnad Hornstull	153
Byggnadstekniska Byrån i Stockholm AB		Medicinaren 23, TFH Byggnad 1	154
C. Maraveas Partnership		Assessment and Rehabilitation of the First Greek Power Plant	154
Caadplan GmbH		Survey of an Airplane Construction Hangar in 3D	74
CAB Cuiabá		Improvement of Pedra 90 Region Water Supply System	176
Captae		3D Laser Scan Survey of the College of Industrial Engineers of Barcelona	37
Carsten Roth Architekt		Kunst Campus at the Hamburger Bahnhof	50
CASAN		Diagnosis and Improvement of Videira's Water Supply System	176
CASAN		São Joaquim Water Supply Alternatives Study	177
Cathie Associates	W	Montevideo Multipurpose Harbour	66
CH2M HILL	F	Skyway Wastewater Treatment Plant Phase II Expansion	189
China ENFI Engineering Corporation		400,000 TPA Copper Smelting Project	80
China Shipbuilding NDRI Engineering Co., Ltd		The Application of BIM on Twin Office Buildings	37
CIDCO		Kamothe Police Station	155
CIDCO		Karanjade Sewerage System Design	177
CIDCO		Karanjade Water Supply System Design	178
CIDCO		Kharghar Police Station	155
CIDCO		School Building for Raigad Zilla Parishad	156
City of Eindhoven	F	3D City and IFC Integrated	57
Coffey Geotechnics (NZ) Ltd		Transmission Gully Project	135
Comsa Emte		Teror Bridge Construction Using Civil BIM Methodology	29
Consulting Engineers Group Ltd.		Detailed Engineering Design of Gomati-Udaipur Section of NH 8	136
CREA s.r.l.		Improving Network and Plant Management Through the Utilization of Mathematical Models	178
CTCI Corporation		USI 50 Kiloton-per-anum Ethylene-vinyl Acetate Copolymer Project	112
Cyient Ltd		Spatial Conversion Solutions Through InTelEct	164
Czech Office for Surveying, Mapping and Cadastre		GIS Governs Czech Election Districts	58
Czech Office for Surveying, Mapping and Cadastre		XFM Elevates Richness of Cadastre Data	59
D&H Steel Construction	F	Westgate Footbridge	149
Dar Al Omran, H&S, and NOD		Zarqa and Russifa Water Network Restructuring and Rehabilitation	179
De Zuidlanden		Wiarda	68
Demont S.r.l.		Enipower's Bolgiano Cogeneration Plant	104
DESEIN		108 MW Gas-based Combined Cycle Power Project	104

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Organization

Organization Name			Project Name	Page
Development Office of Gdańsk			Analysis of the Tram Line in Downtown Gdansk	59
Diplamar Servicios de Ingeniería S.A. de C.V.			Reinforcement of a Semi-submersible Platform	86
Dockwise Shipping B.V.	W		SHWE Transportation and Installation	84
Dside, Paul Wurth, gk engineering, Lucien Zbiorczyk, and Betic			Park-and-ride Facility for Belval-Usines Station	126
Eastman Chemical Company	F		Journey to a New Global Information-sharing Platform	111
EDP España			ART-e	164
EDPR			ProjectWise EDPR	105
Egis India			Katihar – Balrampur (SH-98) Package VIII	136
EILAND 7 architecten			TODI Indoor Diving Center	38
ELBUD-PROJEKT Warszawa Sp. z o.o.			Construction of 400 kV Distribution Line	165
ElectraNet	F		Bentley Substation Implementation and Integration into ElectraNet SOP	161
Energoprojekt Gliwice and Abener Energia			450 MW Combined Cycle Power Plant	105
ENERGOPROJEKT-KATOWICE SA			71 MW Power Unit at Przyjazn Coke Plant	106
Enerya Gaz Dağıtım A.Ş.			ENERgis – Enterprise Natural Gas GIS Project	165
Engbras Software Projetos Ltda			BIM Modeling for More Than 2 Million Square Meters of Buildings	38
Engevix Engenharia, Themag Engenharia, and Planservi Engenharia	F	SR	Santos Guarujá Tunnel	15, 133
Engineers India Limited			Deck Supporting Frame to Facilitate Installation of Four-legged 6500 MT Process Deck	86
Engineers India Limited			Requalification Study of 50 Existing Offshore Platforms	87
Eskom Holdings SOC Limited			Bentley Substation Proof of Concept Project – Greytown MTS	166
Felci Yacht Design			Dufour 500 Grand Large	87
Felgen & Associés			Syrdall Schwemm Water World	39
Felgen & Associés, BOLLES+WILSON, and WW+Architects			Bibliothèque Nationale de Luxembourg	39
FIGG Bridge Engineers, Inc.			Monongahela River Bridge	29
FINNMAP Infra Oy			Construction of Highway 25, Meltola-Mustio	137
Fitzpatrick Engineering Group	F		Octapharma Blood Plasma Facility	149
Frischmann Prabhu (India) Pvt. Ltd.			Development of Indian Institute of Technology – Mandi Campus at Kamand	179
Gemeente Bergen op Zoom			Use of Public Space Management Data	68
Giprotransput			Volga Bridge	30
GMI S.A. Ingenieros Consultores			Tailing Storage Facilities, Cyclones and Tailing Distribution	113
Golovnoi Institut VNIPIET LLC			Multiprogramming Environment of SPbAEP for Structural Design	51
Guangdong Hydropower Planning & Design Institute	F		3D Design for Qingyuan Pumped Storage Power Station – Detailed Design and Construction	73
Guiyang Aluminum Magnesium Design & Research Institute			Heqing Phase-I Project	80
Guodian United Power Technology Co., Ltd.			Offshore New Energy Utilization Research and Development Project	88
Hamkar Company			Monument of Halabja	40
Hanson Professional Services Inc.	F		Alaska's Northern Rail Extension: Tanana River Bridge	27
Harris Pye Engineering			Marlim Sul Helideck Removal and Replacement	88

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
Harris Pye Engineering			MV-18 Material Handling Structures	89
Harris Pye Engineering			Ocean Endeavour Helideck Enlargement	89
Hatch Mott MacDonald	W		Intelligent Rail Signal Design via 2D Schematics and 3D Models	124
HDR	F	SR	Tappan Zee Hudson River Crossing: The New NY Bridge	12, 27
Henan Water & Power Engineering Consulting Co., Ltd			Qishuihe River Inverted Siphon Reconstruction Project	51
Hitachi-GE Nuclear Energy, Ltd.	W		Development of Decommissioning Engineering Platform Based on Plant 3D Model	102
I.Y.Genesis Advanced Engineering Ltd.	F		Bobo II-III 54 MW Power Plant	103
Indah Water Konsortium Sdn Bhd			Redevelopment in Bunus Catchment	180
Indian Technocrat Ltd.			Detailed Engineering Designs for Four-laning of Nagpur-Betul Section of NH 69	137
Ineco			New Torrelavega Rail Station	126
Infra Support Engineering Consultants Pvt. Ltd.			Bangalore Road-ORR Junction Grade Separators	138
IRCLASS – Indian Register of Shipping			Mobile Offshore Drilling Unit to Mobile Offshore Production Unit Conversion	90
ISGEC Heavy Engineering			200 TPH Pinhole Grate Boiler Structure	106
J.L. Patterson & Associates, Inc.	W		Tehachapi Mountains Double Track Project	118
Jacobs	W		EPC Success Using ConstructSim	48
Jacobs and Bouygues Civil Works Florida	W		Port of Miami Tunnel and Access Improvements	72
Jarlsø Telecom Solution Norway AS			Telecommunication Towers	156
JM Souto Engenharia	F		Detailed Project for the Adequacy of the Alternative Railway Route	125
John Portman & Associates			Lane Field North	40
John Portman & Associates			Shen Yuan Continuing Care Retirement Community	41
John Portman & Associates	F		Yinchuan Greenland Center	35
John Wardle Architects and Terroir, in association			Institute for Marine and Antarctic Studies	41
K2 Ingeneiría			New Bridge over Duero River	30
Kavin Engineering And Services Private Limited	F		Power Plant for Garraf Development Facility Operation	103
Kavin Engineering And Services Private Limited			Top Side Engineering – FPU Joko Tole	90
KEPCO E&C			Model Review Item Management System	120
KEPCO E&C			Samcheok Green Power Units 1 and 2	107
Keystone Engineering Inc.			Virginia Offshore Wind Technology Advancement Project	91
Kokusai Kogyo Co., Ltd.	F		Disaster Prevention and Risk Reduction Project	57
Komes Ltd.			Gas Pulsation Problems and Piping Systems Strength Assessment	113
Korea Engineering Consultants Corp.			BMW Driving Center Construction	138
L&T Construction			Development of Sewerage Collection, Treatment, and Reuse	180
L&T Construction			Development of Sewerage Network And Waste Water Treatment Facility for Kalyani	181
L&T Construction			Hyderabad Metro Rail Project	127
L&T Construction			Kochi Metro Cantilever Construction	31
L&T Construction – Transportation Infrastructure Independent Company			Four-laning of Beawar-Pali Stretch of NH 14	139

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Organization

Organization Name			Project Name	Page
L&T Construction – Transportation Infrastructure Independent Company			Six-laning of Krishnagiri-Walajapet Stretch of NH 46	139
L&T Construction – Water and Effluent Treatment			Laxmangarh-Fatehpur Water Supply Project	181
L&T Construction – Water and Effluent Treatment			Udaipura Multi-villiage Rural Water Supply Scheme	182
L&T Hydrocarbon Engineering Ltd			Nasr Phase I Development Project	91
L&T Hydrocarbon Engineering Ltd			Nasr Phase I Offshore Bridge Engineering	92
L&T Hydrocarbon Engineering Ltd			Umm Lulu Phase I Development Project	92
L&T RAMBOLL Consulting Engineers Limited			Detailed Design of 30-kilometer Ring Road (NH 4)	140
L&T-Valdel Engineering Ltd			Yetagun Phase V Development Project	93
Lalitpur Power Generation Company Limited			3x660 MW Lalitpur Super-thermal Power Project Coal-handling Package	157
Larimer County			Road Information Locator	60
LUKOIL-Engineering LLC			An Integrated System for Managing Research and Development Manufacturing Projects	121
Maharashtra Jeevan Pradhikaran			Sustainable Water Supply Scheme for Municipal Councils	182
Mairie de Paris			Philharmonie	60
Manila Water Company, Inc.	W		Marikina North Project	172
Mark O'Bryan, Hugo Mulder, and Rob Snyder			House of the Rising Sun, Beach Center	42
Mayak PO FSUE			Information System for Decommissioning Industrial Uranium-graphite Reactors	74
McCormick Taylor			Route 10 Superstreet Design and Visualization	140
Mercedes-Benz España S.A.			High-shelf Warehouse for Frame Sequencing (ASP)	121
Mericon Oy			3D Maintenance Model Development Project	22
Michigan Department of Transportation	F	SR	ProjectWise: A Change in Construction	14, 49
MidCoast Water			Gloucester Water System – Transforming the Customer Experience With an Optimized Water Distribution Strategy	183
Mintrex Pty Ltd			Garden Well Gold Project	81
MMC Oil & Gas Engineering Sdn Bhd	F		MMCOG Integrated Data Administration	119
Morphosis Architects	W		Emerson College Los Angeles	34
Mosgiprotrans JSC			Adler – Krasnaya Polyana	127
Municipal Enterprise Chernigovvodokanal of the Chernihiv City Council			Creating a System for Remote Monitoring and Control of Water and Wastewater Processes	166
Municipality of Almelo			Water Boulevard Almelo	167
MWH	W		Seafield Wastewater Treatment Works Thermal Hydrolysis	188
MWM Architekci Sp. z o.o.	F		Hotel Arłamów	35
National Institute of Ocean Technology, Ministry of Earth Sciences			Feasibility Study for Design of Fixed and Floating Platforms for Offshore Wind Turbine	93
Navi Mumbai Municipal Corporation			Creation of Urban Base Map, Contour Maps, Infrastructure Maps, and Database Using GIS GPS Technology	61
Neftekhimproekt Kosmos-Neft-Gaz LLC			Workshop for Burning Liquid Waste	107
NJS Engineers India Pvt Ltd.			Water Supply Improvement Scheme for Agra City	183
NJS Engineers India Pvt Ltd.			Water Supply Master Plan for Guwahati Metropolitan Area	184
Odisha Works Department			Odisha Road Asset Management System	23

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
Offshore Oil Engineering Co., Ltd.			Liwan 3-1 Jacket Design	94
Oil and Natural Gas Company Limited			Structural Integrity Assessment of a Typical Wellhead Platform	94
Oil and Natural Gas Company Limited			Structural Integrity Assessment of a Well Platform Jacket Structure	95
Orca Offshore	F		Centrica F3-FA Self-installing Platform	85
Orca Offshore			Shallow Water Dynamic Lift and Mooring Analysis	95
Ordnance Survey Ireland	W		A New Authoritative Spatial Data Infrastructure for Ireland	56
Oregon Department of Transportation			Transportation Information Gateway Collaboration	23
Pall			VGO FCC MCB Filtration System (Slurry Oil Backwash Filter System)	114
PI JSC and the VT Lenaeroproekt Research Institute			Engineering Data Management System and Design Documentation in Electronic Form using ProjectWise	52
Planservi Engenharia Ltda.			Preparation for Lane and Paving Recovery on the Shoulders of SP-250	141
PowerChina Hubei Electric Engineering Corporation			Nawabganj 100 MW Heavy-oil Gas Turbine Project	108
PowerChina Hubei Electric Engineering Corporation			Xiandong Jingzhou 220 kV Substation	167
Poyry Tecnologia Ltda. and Orb Design Ltda.			Procat Multipurpose Catalyst Laboratory	42
PT. Timas Suplindo			LIMA Subsidence Deck Raising Project	96
QGC Pty Limited	F	SR	The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project	11, 73
Queensland University of Technology and GHD			FEED Solution for the Sugar Industry	114
Ramboll and Parsons Brinckerhoff			Structures and Tunnels Investment Portfolio	141
REMONDIS Arzamas Service LLC			Creation of a Geoinformation System for Water Supply and Sanitation in Arzamas City and District	168
RM Servicios Integrales de Ingeniería			Transfer Towers and Bulk Transport Belts Design	81
Ruentex Group			CityLink SongShan BOT Project	43
Sabesp			Improvements in Anhangabaú Sewer Collection System	184
Sabesp			Linking New Tanks to a Metropolitan Water Main System	185
Sabesp	F		Overview and Supervision: Cantareira Water Supply System	173
Saipem			Zawtika 1A	96
Samsung Heavy Industries			Jacket Launching Analysis, the Parametric Study for Bottom Clearance Securement	97
Samsung Heavy Industries			Strength Analysis for FPSO Caisson and Support Structure	97
Seoyeong Engineering			Suseo-Pyeongtaek 5th Sector KTX Station Construction BIM Design	128
Severn Trent Water Ltd	W		EToN 6 – Technology in Street Works	20
Shawmut Design and Construction			Dudley Square Municipal Building	52
Siem Steur Staalconstructies B.V.			Westermoskee	157
Sigma Mascot (HK) Limited			Pointools Innovation – Utilizing Technology to Preserve Our History	43
signum+ architects			IOK Logistics Innovation and Training Center (LITC)	44
Silga			New Azizia Bridge	31
SMEC Australia Pty Ltd			Princes Highway Gerringong Upgrade	142
SMEC India Pvt Ltd			Balance Work in Four-laning of Pathankot-Jammu and Jammu Bypass	142
SMEC India Pvt Ltd and SMEC International Pty Ltd			Two-laning of NH 94 Rishikesh – Dharasu	143

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Organization

Organization Name		Project Name	Page
SNC-Lavalin UK Limited	F	Mariner Jacket Detailed Design	85
SOTEPA Ltda.		SC 445 Highway Widening and Improvement	143
Southern Company		Seamless Handover of Project Data for Asset Operations and Maintenance Using eB Data Quality Manager	24
Southwest Electric Power Design Institute	F	Zhaotong Converter Station	161
SpawGlass		Frost Westover Hills Office Building and Parking Structure	53
Stadtwerke Sindelfingen GmbH		Bentley sisIMS Goes Mobile!	168
Stanley Beaman Sears with WHR Architects and Overland Partners		Children's Hospital of San Antonio	44
State Nuclear Power Engineering Company		Sanmen Nuclear Power Plant Project Stage I	75
SUDOP PRAHA a.s.		Optimization of Railway Line, Praha Hostivar – Praha Central Station	128
Susquehanna Civil Inc.		Test Borings Logging Innovation using Bentley's gINT	69
Svendborg Kommune		Registration of Roads in SQL Spatial Database in Bentley Map	61
Synargio Architects		Westhoffhuis	45
Taesung S&I		Pre-feasibility Study System for Long-span Cable Bridge	32
Takahashi Architect Ltd.		Minami Nagareyama Apartment Project	45
Takenaka Corporation	SR	Yawaragi Mori no Stadium	16, 48
Tamil Nadu Water Supply and Drainage Board		Perugamani to NTPL Rising Main	185
Tata Growth Shop		The Rath	158
Tekenburo Kembang Kastur		New Expanded-capacity High-tech Manufacturing Building	75
Tenaga Nasional Berhad	F	Asset Performance Management at Tenaga Nasional Berhad Power Plants	21
Territory and Municipal Services		An Agile Hosted ProjectWise Implementation in a Government Setting	62
The Monuments Board of the Slovak Republic		Digital Monuments Fund	62
Tianjin MCC20 Construction Co., Ltd	F	1×600m² Sintering Machine Phase-I Project	111
Time Warner Cable	W	An Enterprise GIS Strategy for Increased Revenue and Lower Costs Using Bentley's Communications Solution	160
TomskNIPIneft JSC		Complex Construction of First Tier Facilities on Yurubcheno-Tokhomskoye Field	115
Track Access Services Ltd	F	Track Access Survey and Sighting	125
TyumenNIIgiprogaz LLC		Developing an Information Model for a Gas Processing Plant	115
UBV Umweltbüro GmbH, Vermessungsbüro Keßler und Puggel, and cadcom Systemhaus GmbH		Horizontal Filter Wells Design Experiences, 3D Surveys, and Visualizations	190
Urbica		Congo Blast	98
URS		Kabra Holding Roads	129
Vale Manitoba Operations	F	T1 Mine, 4160 Level Loading Pocket Redesign and Rebuild	79
Vasai Virar City Municipal Corporation		Implementation of Property Tax Reforms for Vasai Virar City Municipal Corporation	63
VMarchitectuur		Eemshaven Windfarm	46
Walter P Moore		Almeda Road Reconstruction	144
Washington State Department of Transportation	F	I-90 – Snoqualmie Pass East (Phase 1A through Phase 2A)	133
Well-Connected Alliance	W	The Waterview Connection	132
West Virginia Department of Transportation		Implementation of a Bentley-hosted SUPERLOAD System	144

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
Western Power Distribution			Development of Bentley Map Mobile for Field Operations	169
Wipro Enterprises			Wipro Fatty Acid Plant	158
Wodociągi i Kanalizacja Sp. z o.o.			Construction of Information System	169
Yash Engineering Consultants Pvt. Ltd.			Hydraulic Modeling and Capital Works for Panvel Water Supply Scheme	186
Yash Engineering Consultants Pvt. Ltd.			Partur Water Supply System	186
Yenon – Research & Design Ltd.			Road 6 – Cross Israel Road	145
Zentech Engineering Co., Ltd			PTTLNG Receiving Terminal Expansion Project – Phase II	98
Zentech Engineering Co., Ltd			Satah Al Razboot (SARB) Field Development Project – Package 4 EPC Work	99
Zhongnan Engineering Corporation Limited	F		3D Collaborative Design Accelerates Industry Revolution – The Standardized Design and Application of Water Project	189

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Country

Organization Name			Project Name	Location	Page
Australia					
Barwon Water			Colac Water Hammer Analysis	Geelong	174
Barwon Water			Water Quality Modelling	Geelong	175
ElectraNet	F		Bentley Substation Implementation and Integration into ElectraNet SOP	Adelaide	161
John Wardle Architects and Terroir, in association			Institute for Marine and Antarctic Studies	Hobart	41
MidCoast Water			Gloucester Water System – Transforming the Customer Experience With an Optimised Water Distribution Strategy	Gloucester	183
Mintrex Pty Ltd			Garden Well Gold Project	Duketon	81
QGC Pty Limited	F	SR	The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project	Gladstone	11, 73
Queensland University of Technology and GHD			FEED Solution for the Sugar Industry	Brisbane	114
SMEC Australia Pty Ltd			Princes Highway Gerringong Upgrade	Gerringong	142
Territory and Municipal Services			An Agile Hosted ProjectWise Implementation in a Government Setting	Canberra	62
URS			Kabra Holding Roads		129
Bangladesh					
PowerChina Hubei Electric Engineering Corporation			Nawabganj 100 MW Heavy-oil Gas Turbine Project	Nawabganj	108
Belgium					
EILAND 7 architecten			TODI Indoor Diving Center	Beringen	38
signum+ architects			IOK Logistics Innovation and Training Center (LITC)	Laakdal	44
Brazil					
CAB Cuiabá			Improvement of Pedra 90 Region Water Supply System	Cuiabá	176
CASAN			Diagnosis and Improvement of Videira's Water Supply System	Videira	176
CASAN			São Joaquim Water Supply Alternatives Study	São Joaquim	177
Engbras Software Projetos Ltda			BIM Modeling for More Than 2 Million Square Meters of Buildings	São Bernardo do Campo	38
Engevix Engenharia, Themag Engenharia, and Planservi Engenharia	F	SR	Santos Guarujá Tunnel	Santos and Guarujá	15, 133
Harris Pye Engineering			Marlim Sul Helideck Removal and Replacement		88
Harris Pye Engineering			MV-18 Material Handling Structures		89
JM Souto Engenharia	F		Detailed Project for the Adequacy of the Alternative Railway Route	Congonhas	125
Planservi Engenharia Ltda.			Preparation for Lane and Paving Recovery on the Shoulders of SP-250	Capão Bonito, Guapiara, Apiaí and Ribeira	141
Poyry Tecnologia Ltda. and Orb Design Ltda.			Procat Multipurpose Catalyst Laboratory	Santa Cruz	42
Sabesp			Improvements in Anhangabaú Sewer Collection System	São Paulo	184
Sabesp			Linking New Tanks to a Metropolitan Water Main System	São Paulo	185
Sabesp	F		Overview and Supervision: Cantareira Water Supply System	São Paulo	173
SOTEPA Ltda			SC 445 Highway Widening and Improvement	Içara	143
Burkina Faso					
I.Y.Genesis Advanced Engineering Ltd.	F		Bobo II-III 54 MW Power Plant	Bobo-Dioulasso	103

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Location	Page
Canada					
Agrium Inc.	F		Agrium Vanscoy Potash Operations Reliability Improvement Project	Vanscoy	21
CH2M HILL	F		Skyway Wastewater Treatment Plant Phase II Expansion	Burlington	189
Hatch Mott MacDonald	W		Intelligent Rail Signal Design via 2D Schematics and 3D Models	Mississauga	124
Vale Manitoba Operations	F		T1 Mine, 4160 Level Loading Pocket Redesign and Rebuild	Thompson	79
China					
Anhui Transport Consulting & Design Institute Co., Ltd	W		Second Wuhu Yangtze River Highway Bridge	Wuhu	26
Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences	W	SR	Five-hundred-meter Aperture Spherical Radio Telescope (FAST)	Karst	13, 148
Bogle Architects			Beijing Green Building Park Visitor Center	Beijing	36
China ENFI Engineering Corporation			400,000 TPA Copper Smelting Project	Fangchenggang	80
China Shipbuilding NDRI Engineering Co., Ltd			The Application of BIM on Twin Office Buildings	Shanghai	37
Guangdong Hydropower Planning & Design Institute	F		3D Design for Qingyuan Pumped Storage Power Station – Detailed Design and Construction	Qingyuan	73
Guiyang Aluminum Magnesium Design & Research Institute			Heqing Phase-I Project	Xiyi, Heqing	80
Guodian United Power Technology Co., Ltd.			Offshore New Energy Utilization Research and Development Project		88
Henan Water & Power Engineering Consulting Co., Ltd			Qishuihe River Inverted Siphon Reconstruction Project	Xianyang	51
John Portman & Associates			Shen Yuan Continuing Care Retirement Community	Songjiang	41
John Portman & Associates	F		Yinchuan Greenland Center	Yinchuan	35
Offshore Oil Engineering Co., Ltd.			Liwan 3-1 Jacket Design		94
PowerChina Hubei Electric Engineering Corporation			Xiandong Jingzhou 220 kV Substation	Jingzhou	167
Sigma Mascot (HK) Limited			Pointools Innovation – Utilizing Technology to Preserve Our History	Hong Kong	43
Southwest Electric Power Design Institute	F		Zhaotong Converter Station		161
State Nuclear Power Engineering Company			Sanmen Nuclear Power Plant Project Stage I	Sanmen	75
Tianjin MCC20 Construction Co., Ltd	F		1×600m^2 Sintering Machine Phase-I Project	Rizhao	111
Zhongnan Engineering Corporation Limited	F		3D Collaborative Design Accelerates Industry Revolution – The Standardized Design and Application of Water Project		189
Czech Republic					
Czech Office for Surveying, Mapping and Cadastre			GIS Governs Czech Election Districts	Prague	58
Czech Office for Surveying, Mapping and Cadastre			XFM Elevates Richness of Cadastre Data	Prague	59
SUDOP PRAHA a.s.			Optimization of Railway Line, Praha Hostivar – Praha Central Station	Prague	128
Denmark					
AG5 Architects			Kildevælds School	Copenhagen	36
Svendborg Kommune			Registration of Roads in SQL Spatial Database in Bentley Map	Svendborg	61
Finland					
FINNMAP Infra Oy			Construction of Highway 25, Meltola-Mustio	Meltola – Mustio	137
Mericon Oy			3D Maintenance Model Development Project	Helsinki	22

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Country

Organization Name			Project Name	Location	Page
France					
Mairie de Paris			Philharmonie	Paris	60
Germany					
Caadplan GmbH			Survey of an Airplane Construction Hangar in 3D	Hamburg	74
Carsten Roth Architekt			Kunst Campus at the Hamburger Bahnhof	Berlin	50
Stadtwerke Sindelfingen GmbH			Bentley sisIMS Goes Mobile!	Sindelfingen	168
UBV Umweltbüro GmbH, Vermessungsbüro Keßler und Puggel, and cadcom Systemhaus GmbH			Horizontal Filter Wells Design Experiences, 3D Surveys, and Visualizations	Berlin	190
Greece					
AKATT S.A.			Automation Systems for Remote Control, Operation, and Water Leak Management	Rhodes	174
C. Maraveas Partnership			Assessment and Rehabilitation of the First Greek Power Plant	Athens	154
India					
ADG (D&C)			Swimming Pool at Pune	Pune	150
AECOM India – Delhi Jal Board		F	Sewerage Master Plan – 2031 for NCT of Delhi	New Delhi	173
AECOM India Pvt. Ltd.			Delhi-Jaipur Greenfield Expressway		134
Afcons Infrastructure Limited			Barapulla Elevated Corridor Phase I and II	New Delhi	150
Afcons Infrastructure Limited			Cantilever Form Traveler	New Delhi	151
Afcons Infrastructure Limited			Erection Gantry for Precast Crash Barriers	Kolkata	151
Aker Powergas Pvt Ltd			Process Structure for a Petrochemical Plant		152
Ashida Electronics			Control and Relay Panel for 132/33 kV	Mumbai	162
Aster Building Solutions Pvt Ltd			Navi Mumbai Metro Rail Station	Navi Mumbai	152
CIDCO			Kamothe Police Station	Navi Mumbai	155
CIDCO			Karanjade Sewerage System Design	Navi Mumbai	177
CIDCO			Karanjade Water Supply System Design	Navi Mumba	178
CIDCO			Kharghar Police Station	Navi Mumbai	155
CIDCO			School Building for Raigad Zilla Parishad	Navi Mumbai	156
Consulting Engineers Group Ltd.			Detailed Engineering Design of Gomati-Udaipur Section of NH 8	Udaipur	136
Cyient Ltd			Spatial Conversion Solutions Through InTelEct	Hyderabad	164
DESEIN			108 MW Gas-based Combined Cycle Power Project	New Delhi	104
Egis India			Katihar – Balrampur (SH-98) Package VIII	Katihar	136
Engineers India Limited			Deck Supporting Frame to Facilitate Installation of Four-legged 6500 MT Process Deck	Gujarat	86
Engineers India Limited			Requalification Study of 50 Existing Offshore Platforms	Delhi	87
Frischmann Prabhu (India) Pvt. Ltd.			Development of Indian Institute of Technology – Mandi Campus at Kamand	Mandi	179
Indian Technocrat Ltd.			Detailed Engineering Designs for Four-laning of Nagpur-Betul Section of NH 69	Nagpur	137
Infra Support Engineering Consultants Pvt. Ltd.			Bangalore Road-ORR Junction Grade Separators	Mysore	138

Winner | Finalist | Special Recognition Award Winner

Organization Name			Project Name	Location	Page
IRCLASS – Indian Register of Shipping			Mobile Offshore Drilling Unit to Mobile Offshore Production Unit Conversion	Mumbai	90
L&T Construction			Development of Sewerage Collection, Treatment, and Reuse	Raipur	180
L&T Construction			Development of Sewerage Network and Waste Water Treatment Facility for Kalyani	Kolkata	181
L&T Construction			Hyderabad Metro Rail Project	Hyderabad	127
L&T Construction			Kochi Metro Cantilever Construction	Kochi	31
L&T Construction – Transportation Infrastructure Independent Company			Four-laning of Beawar-Pali Stretch of NH 14	Pali	139
L&T Construction – Transportation Infrastructure Independent Company			Six-laning of Krishnagiri-Walajapet Stretch of NH 46	Krishnagiri-Walajapet	139
L&T Construction – Water and Effluent Treatment			Laxmangarh-Fatehpur Water Supply Project	Laxmangarh to Fatehpur	181
L&T Construction – Water and Effluent Treatment			Udaipura Multi-village Rural Water Supply Scheme	Udaipura	182
L&T RAMBOLL Consulting Engineers Limited			Detailed Design of 30-kilometer Ring Road (NH 4)	Chennai	140
Lalitpur Power Generation Company Limited			3x660 MW Lalitpur Super-thermal Power Project Coal-handling Package	Lalitpur	157
Maharashtra Jeevan Pradhikaran			Sustainable Water Supply Scheme for Municipal Councils		182
National Institute of Ocean Technology, Ministry of Earth Sciences			Feasibility Study for Design of Fixed and Floating Platforms for Offshore Wind Turbine	Chennai	93
Navi Mumbai Municipal Corporation			Creation of Urban Base Map, Contour Maps, Infrastructure Maps, and Database Using GIS GPS Technology	Navi Mumbai	61
NJS Engineers India Pvt Ltd.			Water Supply Improvement Scheme for Agra City	Agra	183
NJS Engineers India Pvt Ltd.			Water Supply Master Plan for Guwahati Metropolitan Area	Guwahati	184
Odisha Works Department			Odisha Road Asset Management System	Bhubaneswar	23
Oil and Natural Gas Company Limited			Structural Integrity Assessment of a Typical Wellhead Platform	Mumbai	94
Oil and Natural Gas Company Limited			Structural Integrity Assessment of a Well Platform Jacket Structure	Mumbai	95
SMEC India Pvt Ltd			Balance Work in Four-laning of Pathankot-Jammu and Jammu Bypass Section		142
SMEC India Pvt Ltd and SMEC International Pty Ltd			Two-laning of NH 94 Rishikesh – Dharasu	Rishikesh	143
Tamil Nadu Water Supply and Drainage Board			Perugamani to NTPL Rising Main		185
Tata Steel Growth Shop			The Rath	Kalinganagar	158
Vasai Virar City Municipal Corporation			Implementation of Property Tax Reforms for Vasai Virar City Municipal Corporation	Thane	63
Wipro Enterprises			Wipro Fatty Acid Plant	Haridwar	158
Yash Engineering Consultants Pvt. Ltd.			Hydraulic Modeling and Capital Works for Panvel Water Supply Scheme	Navi Mumbai	186
Yash Engineering Consultants Pvt. Ltd.			Partur Water Supply System	Partur	186
Indonesia					
PT. Timas Suplindo			LIMA Subsidence Deck Raising Project	Tangerang	96
Iraq					
Hamkar Company			Monument of Halabja	Halabja	40
Kavin Engineering And Services Private Limited	F		Power Plant for Garraf Development Facility Operation		103

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Country

Organization Name			Project Name	Location	Page
Ireland					
Ordnance Survey Ireland	W		A New Authoritative Spatial Data Infrastructure for Ireland	Dublin	56
Israel					
Yenon – Research & Design Ltd.			Road 6 – Cross Israel Road		145
Italy					
CREA s.r.l.			Improving Network and Plant Management Through the Utilization of Mathematical Models	Verona	178
Demont S.r.l.			Enipower's Bolgiano Cogeneration Plant	San Donato Milanese	104
Felci Yacht Design			Dufour 500 Grand Large	Padenghe sul Garda	87
Harris Pye Engineering			Ocean Endeavour Helideck Enlargement	Palermo	89
Japan					
Hitachi-GE Nuclear Energy, Ltd.	W		Development of Decommissioning Engineering Platform Based on Plant 3D Model		102
Kokusai Kogyo Co., Ltd.	F		Disaster Prevention and Risk Reduction Project		57
Takahashi Architect Ltd.			Minami Nagareyama Apartment Project	Nagareyama	45
Takenaka Corporation		SR	Yawaragi Mori no Stadium	Toyota-shi	16, 46
Jordan					
Dar Al Omran, H&S, and NOD			Zarqa and Russifa Water Network Restructuring and Rehabilitation	Zarqa	179
Luxumbourg					
Dside, Paul Wurth, gk engineering, Lucien Zbiorczyk, and Betic			Park-and-ride Facility for Belval-Usines Station	Esch-sur-Alzette	126
Felgen & Associés			Syrdall Schwemm Water World	Niederanven	39
Felgen & Associés, BOLLES+WILSON, and WW+Architects			Bibliothèque Nationale de Luxembourg		39
Malaysia					
Indah Water Konsortium Sdn Bhd			Redevelopment in Bunus Catchment	Kuala Lumpur	180
MMC Oil & Gas Engineering Sdn Bhd	F		MMCOG Integrated Data Administration	Kuala Lumpur	119
Tenaga Nasional Berhad	F		Asset Performance Management at Tenaga Nasional Berhad Power Plants	Kuala Lumpur	21
Mexico					
Diplamar Servicios de Ingeniería S.A. de C.V.			Reinforcement of a Semi-submersible Platform	Cuidad del Carmen	86
ISGEC Heavy Engineering			200 TPH Pinhole Grate Boiler Structure	Panuco	106
Mozambique					
Jarlsø Telecom Solution Norway AS			Telecommunication Towers in Mozambique	Maputo	156
Myanmar					
Dockwise Shipping B.V.	W		SHWE Transportation and Installation		84
L&T-Valdel Engineering Ltd			Yetagun Phase V Development Project	Yangon	93
Saipem			Zawtika 1A	Gulf of Mottama	96

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Location	Page
Netherlands					
Bos Constructie V.O.F.			Steel Construction for Bouwservice Liempde Building	Liempde	153
City of Eindhoven	F		3D City and IFC integrated	Eindhoven	57
De Zuidlanden			Wiarda	Leeuwarden	68
Gemeente Bergen op Zoom			Use of Public Space Management Data	Bergen op Zoom	68
Municipality of Almelo			Water Boulevard Almelo	Almelo	167
Orca Offshore	F		Centrica F3-FA Self-installing Platform	Dutch North Sea	85
Orca Offshore			Shallow Water Dynamic Lift and Mooring Analysis		95
Siem Steur Staalconstructies B.V.			Westermoskee	Amsterdam	157
Synargio Architects			Westhoffhuis	Lunteren	45
Tekenburo Kembang Kasturi			New Expanded-capacity High-tech Manufacturing Building	Veldhoven	75
VMarchitectuur			Eemshaven Windfarm	Eemshaven	46
New Zealand					
Coffey Geotechnics (NZ) Ltd			Transmission Gully Project	Wellington	135
D&H Steel Construction	F		Westgate Footbridge	Waitakere, Auckland	149
Well-Connected Alliance	W		The Waterview Connection	Auckland	132
Peru					
Ausenco	W		Constancia Project	Chamaca and Livitaca	78
GMI S.A. Ingenieros Consultores			Tailing Storage Facilities, Cyclones and Tailing Distribution	Arequipa	113
Philippines					
Manila Water Company, Inc.	W		Marikina North Project	Marikina City	172
Poland					
BIPROWODMEL Sp. z o.o.			Rainwater and Meltwater Management	Pozna	175
Development Office of Gdańsk			Analysis of the Tram Line in Downtown Gdansk	Gdansk	59
ELBUD-PROJEKT Warszawa Sp. z o.o.			Construction of 400 kV Distribution Line		165
Energoprojekt Gliwice and Abener Energia			450 MW Combined Cycle Power Plant	Stalowa Wola	105
ENERGOPROJEKT-KATOWICE SA			71 MW Power Unit at Przyjazn Coke Plant	Dabrowa Gornicza	106
Komes Ltd.			Gas Pulsation Problems and Piping Systems Strength Assessment	Sekocin Nowy	113
MWM Architekci Sp. z o.o.	F		Hotel Arłamów	Ustrzyki Dolne	35
Wodociągi i Kanalizacja Sp. z o.o.			Construction of Information System	Dzierżoniów	169
Qatar					
Arup	F		Civil BIM Implementation for Campus Projects	Doha	67
Republic of the Congo					
Urbica			Congo Blast	Pointe Noire	98

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Country

Organization Name			Project Name	Location	Page
Russia					
Bashgiproneftekhim SUE			Warehouse of Spent and Fresh Catalysts		50
Giprotransput			Volga Bridge	Nizhniy Novgorod	30
Golovnoi Institut VNIPIET LLC			Multiprogramming Environment of SPbAEP for Structural Design	St. Petersburg	51
LUKOIL-Engineering LLC			An Integrated System for Managing Research and Development Manufacturing Projects		121
Mayak PO FSUE			Information System for Decommissioning Industrial Uranium-graphite Reactors	Ozyorsk	74
Mosgiprotrans JSC			Adler – Krasnaya Polyana	Sochi	127
Neftekhimproekt Kosmos-Neft-Gaz LLC			Workshop for Burning Liquid Waste	Voronezh	107
PI JSC and the VT Lenaeroproekt Research Institute			Engineering Data Management System and Design Documentation in Electronic Form Using ProjectWise	St. Petersburg	52
REMONDIS Arzamas Service LLC			Creation of a Geoinformation System for Water Supply and Sanitation in Arzamas City and District	Arzamas	168
TomskNIPIneft JSC			Complex Construction of First Tier Facilities on Yurubcheno-Tokhomskoye Field	Krasnoyarsk Krai	115
TyumenNIIgiprogaz LLC			Developing an Information Model for a Gas Processing Plant	Tyumen	115
Saudi Arabia					
RM Servicios Integrales de Ingeniería			Transfer Towers and Bulk Transport Belts Design		81
Silga			New Azizia Bridge	Riyadh	31
Singapore					
Kavin Engineering And Services Private Limited			Top Side Engineering – FPU Joko Tole	Singapore	90
Slovakia					
The Monuments Board of the Slovak Republic			Digital Monuments Fund	Bratislava	62
South Africa					
3DDraughting	W		LPG Import and Storage Terminal	Saldanha Bay	110
Aurecon			Matthew 132/11 kV Substation	Mandini	163
Eskom Holdings SOC Limited			Bentley Substation Proof of Concept Project – Greytown MTS	Johannesburg	166
South Korea					
KEPCO E&C			Model Review Item Management System	Yongin	120
KEPCO E&C			Samcheok Green Power Units 1 and 2		107
Korea Engineering Consultants Corp.			BMW Driving Center Construction	Incheon	138
Pall			VGO FCC MCB Filtration System (Slurry Oil Backwash Filter System)	Yeosu	114
Samsung Heavy Industries			Jacket Launching Analysis, the Parametric Study for Bottom Clearance Securement		97
Samsung Heavy Industries			Strength Analysis for FPSO Caisson and Support Structure	Geoje	97
Seoyeong Engineering Co. Ltd.			Suseo-Pyeongtaek 5th Sector KTX Station Construction BIM Design	Osan	128
Taesung S&I			Pre-feasibility Study System for Long-span Cable Bridge		32
Spain					
Ayuntamiento de Reus			Generation of 3D Maps for the City of Reus	Reus	58
Barcelona Regional S.A.	F		Sediment Balance of the Beaches of Barcelona	Barcelona	67

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Location	Page
Captae			3D Laser Scan Survey of the College of Industrial Engineers of Barcelona	Barcelona	37
Comsa Emte			Teror Bridge Construction Using Civil BIM Methodology	Teror	29
EDP España			ART-e	Oviedo	164
EDPR			ProjectWise EDPR	Madrid	105
Ineco			New Torrelavega Rail Station	Torrelavega	126
K2 Ingeneiría			New Bridge over Duero River	Zamora	30
Mercedes-Benz España S.A.			High-shelf Warehouse for Frame Sequencing (ASP)	Vitoria	121
Sweden					
Byggnadstekniska Byrån i Stockholm AB			Fondbyggnad Hornstull	Stockholm	153
Byggnadstekniska Byrån i Stockholm AB			Medicinaren 23, TFH Byggnad 1	Stockholm	154
Switzerland					
Bühler Group			A Worldwide Bühler Engineering Network	Uzwil	120
Taiwan					
CTCI Corporation			USI 50 Kiloton-per-anum Ethylene-vinyl Acetate Copolymer Project	Kaohsiung	112
Ruentex Group			CityLink SongShan BOT Project	Taipei	43
Thailand					
Zentech Engineering Co., Ltd			PTTLNG Receiving Terminal Expansion Project – Phase II	Map Ta Phut	98
Turkey					
Enerya Gaz Dağıtım A.Ş.			ENERgis – Enterprise Natural Gas GIS Project	Istanbul	165
Ukraine					
Municipal Enterprise Chernigovvodokanal of the Chernihiv City Council			Creating a System for Remote Monitoring and Control of Water and Wastewater Processes	Chernihiv	166
United Arab Emirates					
Arabtec Construction LLC	F		Fairmont Hotel	Abu Dhabi	49
L&T Hydrocarbon Engineering Ltd			Nasr Phase I Development Project	Abu Dhabi	91
L&T Hydrocarbon Engineering Ltd			Nasr Phase I Offshore Bridge Engineering	Abu Dhabi	92
L&T Hydrocarbon Engineering Ltd			Umm Lulu Phase I Development Project	Abu Dhabi	92
Zentech Engineering Co., Ltd			Satah Al Razboot (SARB) Field Development Project – Package 4 EPC Work		99
United Kingdom					
3Deling Sp. z o.o.			Digitising Chemical Plant		112
Bechtel	F		Vauxhall Underground Station: Congestion Relief and Step-free Access Project	London	119
Black & Veatch			UK BIM – The Integral Role of the Intelligent P&ID within the Digital Plan of Works		190
Bristol Water			Mapping the Works	Bristol	163
MWH	W		Seafield Wastewater Treatment Works Thermal Hydrolysis Plant	Edinburgh	188

Winner Finalist Special Recognition Award Winner

Index – Alphabetical By Country

Organization Name			Project Name	Location	Page
Ramboll and Parsons Brinckerhoff			Structures and Tunnels Investment Portfolio	London	141
Severn Trent Water Ltd	W		EToN 6 – Technology in Street Works	Midlands	20
SNC-Lavalin UK Limited	F		Mariner Jacket Detailed Design	Aberdeen	85
Track Access Services Ltd	F		Track Access Survey and Sighting		125
Western Power Distribution			Development of Bentley Map Mobile for Field Operations	Exeter	169
United States					
AECOM and Ferrovial Agroman			North Tarrant Express Segment 3A	Fort Worth, Texas	134
AmerenUE			Design Change Revitalization Project	St. Louis, Missouri	22
American Electric Power		SR	Bentley Substation and eB Implementation	Gahanna, Ohio and Tulsa, Oklahoma,	10, 162
American Structurepoint, Inc.			Maplecrest Road Extension	Fort Wayne to New Haven, Indiana	135
Ausenco	F		Goldstrike	Eureka County, Nevada	79
Beiswenger, Hoch and Associates, Inc.			I-595 Reversible Lanes	Ft. Lauderdale, Florida	28
Beiswenger, Hoch and Associates, Inc.			Spanish River Interchange Improvements	Ft. Lauderdale, Florida	28
Eastman Chemical Company	F		Journey to a New Global Information-sharing Platform	Kingsport, Tennessee	111
FIGG Bridge Engineers, Inc.			Monongahela River Bridge	Brownsville, Pennsylvania	29
Fitzpatrick Engineering Group	F		Octapharma Blood Plasma Facility	Charlotte, North Carolina	149
Hanson Professional Services Inc.	F		Alaska's Northern Rail Extension: Tanana River Bridge	Salcha, Alaska	27
HDR	F	SR	Tappan Zee Hudson River Crossing: The New NY Bridge	Westchester, New York	12, 27
J.L. Patterson & Associates, Inc.	W		Tehachapi Mountains Double Track Project	Tehachapi, California	118
Jacobs	W		EPC Success Using ConstructSim	Houston, Texas	48
Jacobs and Bouygues Civil Works Florida	W		Port of Miami Tunnel and Access Improvements	Miami, Florida	72
John Portman & Associates			Lane Field North	San Diego, California	40
Keystone Engineering Inc.			Virginia Offshore Wind Technology Advancement Project	Virginia	91
Larimer County			Road Information Locator	Fort Collins, Colorado	60
Mark O'Bryan, Hugo Mulder, and Rob Snyder			House of the Rising Sun, Beach Center	Sandestin, Florida	42
McCormick Taylor			Route 10 Superstreet Design and Visualization	Chester, Viginia	140
Michigan Department of Transportation	F	SR	ProjectWise: A Change in Construction	Michigan	14, 49
Morphosis Architects	W		Emerson College Los Angeles	Los Angeles, California	34
Oregon Department of Transportation			Transportation Information Gateway Collaboration	Salem, Oregon	23
Shawmut Design and Construction			Dudley Square Municipal Building	Boston, Massachusetts	52

Winner Finalist Special Recognition Award Winner

Organization Name		Project Name	Location	Page
Southern Company		Seamless Handover of Project Data for Asset Operations and Maintenance Using eB Data Quality Manager	Atlanta, Georgia and Birmingham, Alabama	24
SpawGlass		Frost Westover Hills Office Building and Parking Structure	San Antonio, Texas	53
Stanley Beaman Sears with WHR Architects and Overland Partners		Children's Hospital of San Antonio	San Antonio, Texas	44
Susquehanna Civil Inc.		Test Borings Logging Innovation using Bentley's gINT	Pennsylvania	69
Time Warner Cable	W	An Enterprise GIS Strategy for Increased Revenue and Lower Costs Using Bentley's Communications Solution	Centennial, Colorado	160
Walter P Moore		Almeda Road Reconstruction	Houston, Texas	144
Washington State Department of Transportation	F	I-90 – Snoqualmie Pass East (Phase 1A through Phase 2A)	Hyak, Washington	133
West Virginia Department of Transportation		Implementation of a Bentley-hosted SUPERLOAD System	Charleston, West Virginia	144
Uruguay				
Cathie Associates	W	Montevideo Multipurpose Harbour	Montevideo	66

Winner Finalist Special Recognition Award Winner

Index – By Category

Organization Name			Project Name	Page
Special Recognition Award Winners				
American Electric Power		SR	Bentley Substation and eB Implementation	10
Beijing Building Construction Research Institute Co., Ltd.; Beijing Institute of Architectural Design; National Astronomical Observatories, Chinese Academy of Sciences	W	SR	Five-hundred-meter Aperture Spherical Radio Telescope (FAST)	13
Engevix Engenharia, Themag Engenharia, and Planservi Engenharia	F	SR	Santos Guarujá Tunnel	15
HDR	F	SR	Tappan Zee Hudson River Crossing: The New NY Bridge	12
Michigan Department of Transportation	F	SR	ProjectWise: A Change in Construction	14
QGC Pty Limited	F	SR	The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project	11
Takenaka Corporation		SR	Yawaragi Mori no Stadium	16
Innovation in Asset Performance				
Severn Trent Water Ltd	W		EToN 6 – Technology in Street Works	20
Agrium Inc.	F		Agrium Vanscoy Potash Operations Reliability Improvement Project	21
Tenaga Nasional Berhad	F		Asset Performance Management at Tenaga Nasional Berhad Power Plants	21
AmerenUE			Design Change Revitalization Project	22
Mericon Oy			3D Maintenance Model Development Project	22
Odisha Works Department			Odisha Road Asset Management System	23
Oregon Department of Transportation			Transportation Information Gateway Collaboration	23
Southern Company			Seamless Handover of Project Data for Asset Operations and Maintenance Using eB Data Quality Manager	24
Innovation in Bridges				
Anhui Transport Consulting & Design Institute Co., Ltd	W		Second Wuhu Yangtze River Highway Bridge	26
Hanson Professional Services Inc.	F		Alaska's Northern Rail Extension: Tanana River Bridge	27
HDR	F	SR	Tappan Zee Hudson River Crossing: The New NY Bridge	12, 27
Beiswenger, Hoch and Associates, Inc.			I-595 Reversible Lanes	28
Beiswenger, Hoch and Associates, Inc.			Spanish River Interchange Improvements	28
Comsa Emte			Teror Bridge Construction Using Civil BIM Methodology	29
FIGG Bridge Engineers, Inc.			Monongahela River Bridge	29
Giprotransput			Volga Bridge	30
K2 Ingeneiría			New Bridge over Duero River	30
L&T Construction			Kochi Metro Cantilever Construction	31
Silga			New Azizia Bridge	31
Taesung S&I			Pre-feasibility Study System for Long-span Cable Bridge	32
Innovation in Building				
Morphosis Architects	W		Emerson College Los Angeles	34
John Portman & Associates	F		Yinchuan Greenland Center	35
MWM Architekci Sp. z o.o.	F		Hotel Arłamów	35
AG5 Architects			Kildevælds School	36

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
Bogle Architects			Beijing Green Building Park Visitor Center	36
Captae			3D Laser Scan Survey of the College of Industrial Engineers of Barcelona	37
China Shipbuilding NDRI Engineering Co., Ltd			The Application of BIM on Twin Office Buildings	37
EILAND 7 architecten			TODI Indoor Diving Center	38
Engbras Software Projetos Ltda			BIM Modeling for More Than 2 Million Square Meters of Buildings	38
Felgen & Associés			Syrdall Schwemm Water World	39
Felgen & Associés, BOLLES+WILSON, and WW+Architects			Bibliothèque Nationale de Luxembourg	39
Hamkar Company			Monument of Halabja	40
John Portman & Associates			Lane Field North	40
John Portman & Associates			Shen Yuan Continuing Care Retirement Community	41
John Wardle Architects and Terroir, in association			Institute for Marine and Antarctic Studies	41
Mark O'Bryan, Hugo Mulder, and Rob Snyder			House of the Rising Sun, Beach Center	42
Poyry Tecnologia Ltda. and Orb Design Ltda.			Procat Multipurpose Catalyst Laboratory	42
Ruentex Group			CityLink SongShan BOT Project	43
Sigma Mascot (HK) Limited			Pointools Innovation – Utilizing Technology to Preserve Our History	43
signum+ architects			IOK Logistics Innovation and Training Center (LITC)	44
Stanley Beaman Sears with WHR Architects and Overland Partners			Children's Hospital of San Antonio	44
Synargio Architects			Westhoffhuis	45
Takahashi Architect Ltd.			Minami Nagareyama Apartment Project	45
Takenaka Corporation		SR	Yawaragi Mori no Stadium	16, 46
VMarchitectuur			Eemshaven Windfarm	46
Innovation in Construction				
Jacobs	W		EPC Success Using ConstructSim	48
Arabtec Construction LLC	F		Fairmont Hotel	49
Michigan Department of Transportation	F	SR	ProjectWise: A Change in Construction	14, 49
Bashgiproneftekhim SUE			Warehouse of Spent and Fresh Catalysts	50
Carsten Roth Architekt			Kunst Campus at the Hamburger Bahnhof	50
Golovnoi Institut VNIPIET LLC			Multiprogramming Environment of SPbAEP for Structural Design	51
Henan Water & Power Engineering Consulting Co., Ltd			Qishuihe River Inverted Siphon Reconstruction Project	51
PI JSC and the VT Lenaeroproekt Research Institute			Engineering Data Management System and Design Documentation in Electronic Form using ProjectWise	52
Shawmut Design and Construction			Dudley Square Municipal Building	52
SpawGlass			Frost Westover Hills Office Building and Parking Structure	53
Innovation in Government				
Ordnance Survey Ireland	W		A New Authoritative Spatial Data Infrastructure for Ireland	56
City of Eindhoven	F		3D City and IFC Integrated	57
Kokusai Kogyo Co., Ltd.	F		Disaster Prevention and Risk Reduction Project	57

Winner Finalist Special Recognition Award Winner

Index – By Category

Organization Name			Project Name	Page
Ayuntamiento de Reus			Generation of 3D Maps for the City of Reus	58
Czech Office for Surveying, Mapping and Cadastre			GIS Governs Czech Election Districts	58
Czech Office for Surveying, Mapping and Cadastre			XFM Elevates Richness of Cadastre Data	59
Development Office of Gdańsk			Analysis of the Tram Line in Downtown Gdańsk	59
Larimer County			Road Information Locator	60
Mairie de Paris			Philharmonie	60
Navi Mumbai Municipal Corporation			Creation of Urban Base Map, Contour Maps, Infrastructure Maps, and Database Using GIS GPS Technology	61
Svendborg Kommune			Registration of Roads in SQL Spatial Database in Bentley Map	61
Territory and Municipal Services			An Agile Hosted ProjectWise Implementation in a Government Setting	62
The Monuments Board of the Slovak Republic			Digital Monuments Fund	62
Vasai Virar City Municipal Corporation			Implementation of Property Tax Reforms for Vasai Virar City Municipal Corporation	63
Innovation in Land Development and Management				
Cathie Associates	W		Montevideo Multipurpose Harbour	66
Arup	F		Civil BIM Implementation for Campus Projects in Qatar	67
Barcelona Regional S.A.	F		Sediment Balance of the Beaches of Barcelona	67
De Zuidlanden			Wiarda	68
Gemeente Bergen op Zoom			Use of Public Space Management Data	68
Susquehanna Civil Inc.			Test Borings Logging Innovation using Bentley's gINT	69
Innovation in Megaprojects				
Jacobs and Bouygues Civil Works Florida	W		Port of Miami Tunnel and Access Improvements	72
Guangdong Hydropower Planning & Design Institute	F		3D Design for Qingyuan Pumped Storage Power Station – Detailed Design and Construction	73
QGC Pty Limited	F	SR	The Journey from Physical Assets to Digital Assets for the Queensland Curtis LNG Project	11, 73
Caadplan GmbH			Survey of an Airplane Construction Hangar in 3D	74
Mayak PO FSUE			Information System for Decommissioning Industrial Uranium-graphite Reactors	74
State Nuclear Power Engineering Company			Sanmen Nuclear Power Plant Project Stage I	75
Tekenburo Kembang Kasturi			New Expanded-capacity High-tech Manufacturing Building	75
Innovation in Mining and Metals				
Ausenco	W		Constancia Project	78
Ausenco	F		Goldstrike	79
Vale Manitoba Operations	F		T1 Mine, 4160 Level Loading Pocket Redesign and Rebuild	79
China ENFI Engineering Corporation			400,000 TPA Copper Smelting Project	80
Guiyang Aluminum Magnesium Design & Research Institute			Heqing Phase-I Project	80
Mintrex Pty Ltd			Garden Well Gold Project	81
RM Servicios Integrales de Ingeniería			Transfer Towers and Bulk Transport Belts Design	81
Innovation in Offshore Engineering				
Dockwise Shipping B.V.	W		SHWE Transportation and Installation	84

Winner Finalist Special Recognition Award Winner

Organization Name		Project Name	Page
Orca Offshore	F	Centrica F3-FA Self-installing Platform	85
SNC-Lavalin UK Limited	F	Mariner Jacket Detailed Design	85
Diplamar Servicios de Ingeniería S.A. de C.V.		Reinforcement of a Semi-submersible Platform	86
Engineers India Limited		Deck Supporting Frame to Facilitate Installation of Four-legged 6500 MT Process Deck	86
Engineers India Limited		Requalification Study of 50 Existing Offshore Platforms	87
Felci Yachts Design		Dufour 500 Grand Large	87
Guodian United Power Technology Co., Ltd.		Offshore New Energy Utilization Research and Development Project	88
Harris Pye Engineering		Marlim Sul Helideck Removal and Replacement	88
Harris Pye Engineering		MV-18 Material Handling Structures	89
Harris Pye Engineering		Ocean Endeavour Helideck Enlargement	89
IRCLASS – Indian Register of Shipping		Mobile Offshore Drilling Unit to Mobile Offshore Production Unit Conversion	90
Kavin Engineering And Services Private Limited		Top Side Engineering – FPU Joko Tole	90
Keystone Engineering Inc.		Virginia Offshore Wind Technology Advancement Project	91
L&T Hydrocarbon Engineering Ltd		Nasr Phase I Development Project	91
L&T Hydrocarbon Engineering Ltd		Nasr Phase I Offshore Bridge Engineering	92
L&T Hydrocarbon Engineering Ltd		Umm Lulu Phase I Development Project	92
L&T-Valdel Engineering Ltd		Yetagun Phase V Development Project	93
National Institute of Ocean Technology, Ministry of Earth Sciences		Feasibility Study for Design of Fixed and Floating Platforms for Offshore Wind Turbine	93
Offshore Oil Engineering Co., Ltd.		Liwan 3-1 Jacket Design	94
Oil and Natural Gas Company Limited		Structural Integrity Assessment of a Typical Wellhead Platform	94
Oil and Natural Gas Company Limited		Structural Integrity Assessment of a Well Platform Jacket Structure	95
Orca Offshore		Shallow Water Dynamic Lift and Mooring Analysis	95
PT. Timas Suplindo		LIMA Subsidence Deck Raising Project	96
Saipem		Zawtika 1A	96
Samsung Heavy Industries		Jacket Launching Analysis, the Parametric Study for Bottom Clearance Securement	97
Samsung Heavy Industries		Strength Analysis for FPSO Caisson and Support Structure	97
Urbica		Congo Blast	98
Zentech Engineering Co., Ltd		PTTLNG Receiving Terminal Expansion Project – Phase II	98
Zentech Engineering Co., Ltd		Satah Al Razboot (SARB) Field Development Project – Package 4 EPC Work	99
Innovation in Power Generation			
Hitachi-GE Nuclear Energy, Ltd.	W	Development of Decommissioning Engineering Platform Based on Plant 3D Model	102
I.Y.Genesis Advanced Engineering Ltd.	F	Bobo II-III 54 MW Power Plant	103
Kavin Engineering And Services Private Limited	F	Power Plant for Garraf Development Facility Operation	103
Demont S.r.l.		Enipower's Bolgiano Cogeneration Plant	104
DESEIN		108 MW Gas-based Combined Cycle Power Project	104
EDPR		ProjectWise EDPR	105

Winner Finalist Special Recognition Award Winner

Organization Name		Project Name	Page
Energoprojekt Gliwice and Abener Energia		450 MW Combined Cycle Power Plant	105
ENERGOPROJEKT-KATOWICE SA		71 MW Power Unit at Przyjazn Coke Plant	106
ISGEC Heavy Engineering		200 TPH Pinhole Grate Boiler Structure	106
KEPCO E&C		Samcheok Green Power Units 1 and 2	107
Neftekhimproekt Kosmos-Neft-Gaz LLC		Workshop for Burning Liquid Waste	107
PowerChina Hubei Electric Engineering Corporation		Nawabganj 100 MW Heavy-oil Gas Turbine Project	108
Innovation in Process Manufacturing			
3DDraughting	W	LPG Import and Storage Terminal	110
Eastman Chemical Company	F	Journey to a New Global Information-sharing Platform	111
Tianjin MCC20 Construction Co., Ltd	F	1×600m² Sintering Machine Phase-I Project	111
3Deling Sp. z o.o.		Digitising Chemical Plant	112
CTCI Corporation		USI 50 Kiloton-per-anum Ethylene-vinyl Acetate Copolymer Project	112
GMI S.A. Ingenieros Consultores		Tailing Storage Facilities, Cyclones and Tailing Distribution	113
Komes Ltd.		Gas Pulsation Problems and Piping Systems Strength Assessment	113
Pall		VGO FCC MCB Filtration System (Slurry Oil Backwash Filter System)	114
Queensland University of Technology and GHD		FEED Solution for the Sugar Industry	114
TomskNIPIneft JSC		Complex Construction of First Tier Facilities on Yurubcheno-Tokhomskoye Field	115
TyumenNIIgiprogaz LLC		Developing an Information Model for a Gas Processing Plant	115
Innovation in Project Performance			
J.L. Patterson & Associates, Inc.	W	Tehachapi Mountains Double Track Project	118
Bechtel	F	Vauxhall Underground Station: Congestion Relief and Step-free Access Project	119
MMC Oil & Gas Engineering Sdn Bhd	F	MMCOG Integrated Data Administration	119
Bühler Group		A Worldwide Bühler Engineering Network	120
KEPCO E&C		Model Review Item Management System	120
LUKOIL-Engineering LLC		An Integrated System for Managing Research and Development Manufacturing Projects	121
Mercedes-Benz España S.A.		High-shelf Warehouse for Frame Sequencing (ASP)	121
Innovation in Rail and Transit			
Hatch Mott MacDonald	W	Intelligent Rail Signal Design via 2D Schematics and 3D Models	124
JM Souto Engenharia	F	Detailed Project for the Adequacy of the Alternative Railway Route	125
Track Access Services Ltd	F	Track Access Survey and Sighting	125
Dside, Paul Wurth, gk engineering, Lucien Zbiorczyk, and Betic		Park-and-ride Facility for Belval-Usines Station	126
Ineco		New Torrelavega Rail Station	126
L&T Construction		Hyderabad Metro Rail Project	127
Mosgiprotrans JSC		Adler – Krasnaya Polyana	127
Seoyeong Engineering		Suseo-Pyeongtaek 5th Sector KTX Station Construction BIM Design	128

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
SUDOP PRAHA a.s.			Optimization of Railway Line, Praha Hostivar – Praha Central Station	128
URS			Kabra Holding Roads	129
Innovation in Roads				
Well-Connected Alliance	W		The Waterview Connection	132
Engevix Engenharia, Themag Engenharia, and Planservi Engenharia	F	SR	Santos Guarujá Tunnel	15, 133
Washington State Department of Transportation	F		I-90 – Snoqualmie Pass East (Phase 1A through Phase 2A)	133
AECOM and Ferrovial Agroman			North Tarrant Express Segment 3A	134
AECOM India Pvt. Ltd.			Delhi-Jaipur Greenfield Expressway	134
American Structurepoint, Inc.			Maplecrest Road Extension	135
Coffey Geotechnics (NZ) Ltd			Transmission Gully Project	135
Consulting Engineers Group Ltd.			Detailed Engineering Design of Gomati-Udaipur Section of NH 8	136
Egis India			Katihar – Balrampur (SH-98) Package VIII	136
FINNMAP Infra Oy			Construction of Highway 25, Meltola-Mustio	136
Indian Technocrat Ltd.			Detailed Engineering Designs for Four-laning of Nagpur-Betul Section of NH 69	137
Infra Support Engineering Consultants Pvt. Ltd.			Bangalore Road-ORR Junction Grade Separators	138
Korea Engineering Consultants Corp.			BMW Driving Center Construction	138
L&T Construction – Transportation Infrastructure Independent Company			Four-laning of Beawar-Pali Stretch of NH 14	139
L&T Construction – Transportation Infrastructure Independent Company			Six-laning of Krishnagiri-Walajapet Stretch of NH 46	139
L&T RAMBOLL Consulting Engineers Limited			Detailed Design of 30-kilometer Ring Road (NH 4)	140
McCormick Taylor			Route 10 Superstreet Design and Visualization	140
Planservi Engenharia Ltda.			Preparation for Lane and Paving Recovery on the Shoulders of SP-250	141
Ramboll and Parsons Brinckerhoff			Structures and Tunnels Investment Portfolio	141
SMEC Australia Pty Ltd			Princes Highway Gerringong Upgrade	142
SMEC India Pvt Ltd			Balance Work in Four-laning of Pathankot-Jammu and Jammu Bypass	142
SMEC India Pvt Ltd and SMEC International Pty Ltd			Two-laning of NH 94 Rishikesh – Dharasu	143
SOTEPA Ltda.			SC 445 Highway Widening and Improvement	143
Walter P Moore			Almeda Road Reconstruction	144
West Virginia Department of Transportation			Implementation of a Bentley-hosted SUPERLOAD System	144
Yenon – Research & Design Ltd.			Cross Israel Road	145
Innovation in Structural Engineering				
Beijing Building Construction Research Institute, Beijing Institute of Architectural Design, and National Astronomical Observatories, Chinese Academy of Sciences	W	SR	Five-hundred-meter Aperture Spherical Radio Telescope (FAST)	13, 148
D&H Steel Construction	F		Westgate Footbridge	149
Fitzpatrick Engineering Group	F		Octapharma Blood Plasma Facility	149
ADG (D&C)			Swimming Pool at Pune	150
Afcons Infrastructure Limited			Barapulla Elevated Corridor Phase I and II	150
Afcons Infrastructure Limited			Cantilever Form Traveler	151

Winner Finalist Special Recognition Award Winner

Organization Name			Project Name	Page
Afcons Infrastructure Limited			Erection Gantry for Precast Crash Barriers	151
Aker Powergas Pvt Ltd			Process Structure for a Petrochemical Plant	152
Aster Building Solutions Pvt Ltd			Navi Mumbai Metro Rail Station	152
Bos Constructie V.O.F.			Steel Construction for Bouwservice Liempde Building	153
Byggnadstekniska Byrån i Stockholm AB			Fondbyggnad Hornstull	153
Byggnadstekniska Byrån i Stockholm AB			Medicinaren 23, TFH Byggnad 1	154
C. Maraveas Partnership			Assessment and Rehabilitation of the First Greek Power Plant	154
CIDCO			Kamothe Police Station	155
CIDCO			Kharghar Police Station	155
CIDCO			School Building for Raigad Zilla Parishad	156
Jarlsø Telecom Solution Norway AS			Telecommunication Towers	156
Lalitpur Power Generation Company Limited			3x660 MW Lalitpur Super Thermal Power Project Coal Handling Package	157
Siem Steur Staalconstructies B.V.			Westermoskee	157
Tata Growth Shop			The Rath	158
Wipro Enterprises			Wipro Fatty Acid Plant	158
Innovation in Utilities and Communications Networks				
Time Warner Cable	W		An Enterprise GIS Strategy for Increased Revenue and Lower Costs Using Bentley's Communications Solution	160
ElectraNet	F		Bentley Substation Implementation and Integration into ElectraNet SOP	161
Southwest Electric Power Design Institute	F		Zhaotong Converter Station	161
American Electric Power		SR	Bentley Substation and eB Implementation	162
Ashida Electronics			Control and Relay Panel for 132/33 kV	162
Aurecon			Matthew 132/11 kV Substation	163
Bristol Water			Mapping the Works	163
Cyient Ltd			Spatial Conversion Solutions Through InTelEct	164
EDP España			ART-e	164
ELBUD-PROJEKT Warszawa Sp. z o.o.			Construction of 400 kV Distribution Line	165
Enerya Gaz Dağıtım A.Ş.			ENERgis – Enterprise Natural Gas GIS Project	165
Eskom Holdings SOC Limited			Bentley Substation Proof of Concept Project – Greytown MTS	166
Municipal Enterprise Chernigovvodokanal of the Chernihiv City Council			Creating a System for Remote Monitoring and Control of Water and Wastewater Processes	166
Municipality of Almelo			Water Boulevard Almelo	167
PowerChina Hubei Electric Engineering Corporation			Xiandong Jingzhou 220 kV Substation	167
REMONDIS Arzamas Service LLC			Creation of a Geoinformation System for Water Supply and Sanitation in Arzamas City and District	168
Stadtwerke Sindelfingen GmbH			Bentley sisIMS Goes Mobile!	168
Western Power Distribution			Development of Bentley Map Mobile for Field Operations	169
Wodociągi i Kanalizacja Sp. z o.o.			Construction of Information System	169

W Winner F Finalist SR Special Recognition Award Winner

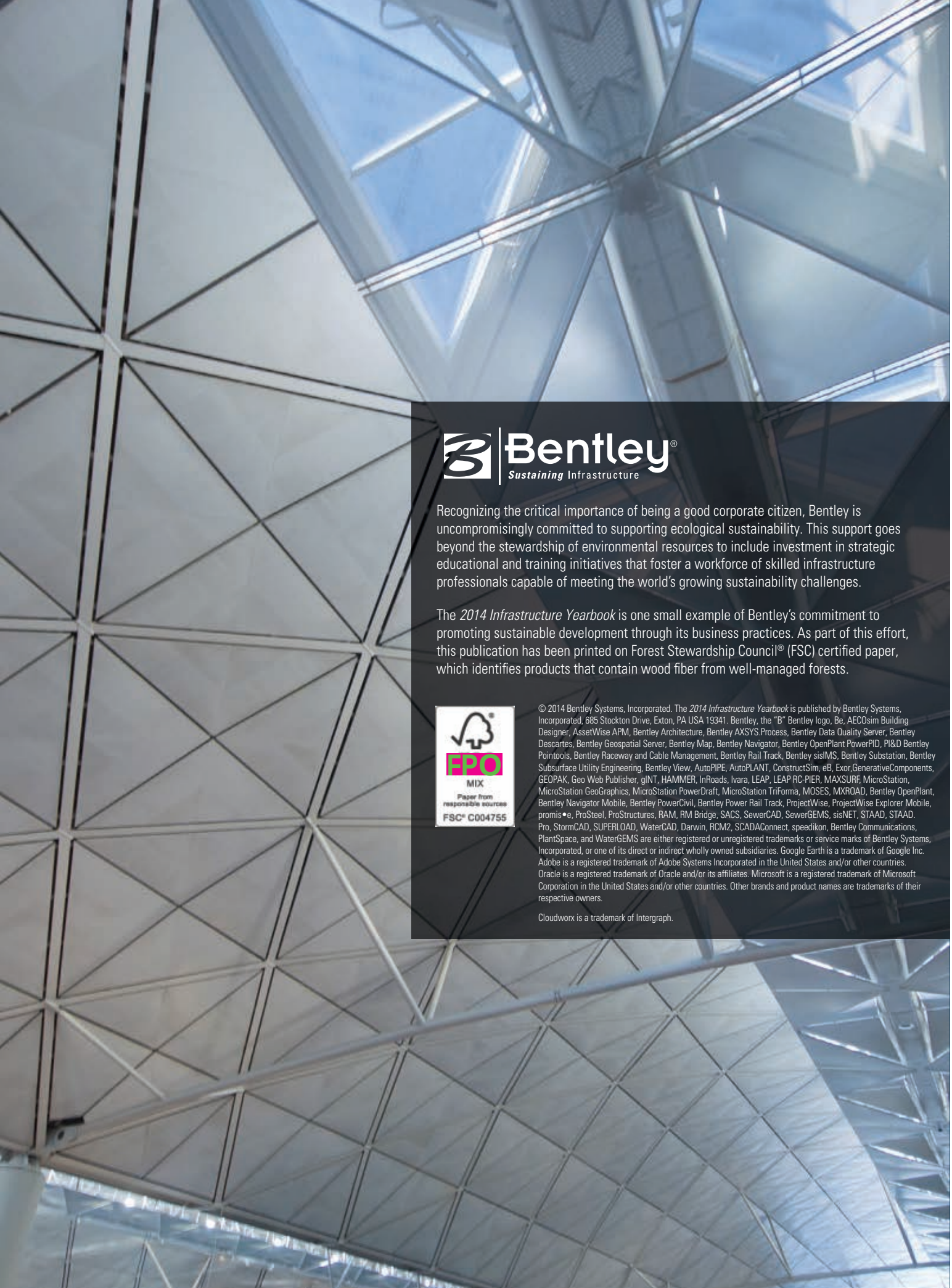
Organization Name			Project Name	Page
Innovation in Water, Wastewater, and Stormwater Network Modeling and Analysis				
Manila Water Company, Inc.	W		Marikina North Project	172
AECOM India – Delhi Jal Board	F		Sewerage Master Plan – 2031 for NCT of Delhi	173
Sabesp	F		Overview and Supervision: Cantareira Water Supply System	173
AKATT S.A.			Automation Systems for Remote Control, Operation, and Water Leak Management	174
Barwon Water			Colac Water Hammer Analysis	174
Barwon Water			Water Quality Modelling	175
BIPROWODMEL Sp. z o.o.			Rainwater and Meltwater Management	175
CAB Cuiabá			Improvement of Pedra 90 Region Water Supply System	176
CASAN			Diagnosis and Improvement of Vieira's Water Supply System	176
CASAN			São Joaquim Water Supply Alternatives Study	177
CIDCO			Karanjade Sewerage System Design	177
CIDCO			Karanjade Water Supply System Design	178
CREA s.r.l.			Improving Network and Plant Management Through the Utilization of Mathematical Models	178
Dar Al Omran, H&S, and NOD			Zarqa and Russifa Water Network Restructuring and Rehabilitation	179
Frischmann Prabhu (India) Pvt. Ltd.			Development of Indian Institute of Technology – Mandi Campus at Kamand	179
Indah Water Konsortium Sdn Bhd			Redevelopment in Bunus Catchment	180
L&T Construction			Development of Sewerage Collection, Treatment, and Reuse	180
L&T Construction			Development of Sewerage Network and Wastewater Treatment Facility for Kalyani	181
L&T Construction – Water and Effluent Treatment			Laxmangarh-Fatehpur Water Supply Project	181
L&T Construction – Water and Effluent Treatment			Udaipura Multi Village Rural Water Supply Scheme	182
Maharashtra Jeevan Pradhikaran			Sustainable Water Supply Scheme for Municipal Councils	182
MidCoast Water			Gloucester Water System – Transforming the Customer Experience With an Optimised Water Distribution Strategy	183
NJS Engineers India Pvt Ltd.			Water Supply Improvement Scheme for Agra City	183
NJS Engineers India Pvt Ltd.			Water Supply Master Plan for Guwahati Metropolitan Area	184
Sabesp			Improvements in Anhangabaú Sewer Collection System	184
Sabesp			Linking New Tanks to a Metropolitan Water Main System	185
Tamil Nadu Water Supply and Drainage Board			Perugamani to NTPL Rising Main	185
Yash Engineering Consultants Pvt. Ltd.			Hydraulic Modeling and Capital Works for Panvel Water Supply Scheme	186
Yash Engineering Consultants Pvt. Ltd.			Partur Water Supply System	186
Innovation in Water or Wastewater Treatment Plants				
MWH	W		Seafield Wastewater Treatment Works Thermal Hydrolysis Plant	188
CH2M HILL	F		Skyway Wastewater Treatment Plant Phase II Expansion	189
Zhongnan Engineering Corporation Limited	F		3D Collaborative Design Accelerates Industry Revolution – The Standardized Design and Application of Water Project	189
Black & Veatch			UK BIM – The Integral Role of the Intelligent P&ID within the Digital Plan of Works	190
UBV Umweltbüro GmbH, Vermessungsbüro Keßler und Puggel, and cadcom Systemhaus GmbH			Horizontal Filter Wells Design Experiences, 3D Surveys, and Visualizations	190

Winner Finalist Special Recognition Award Winner









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