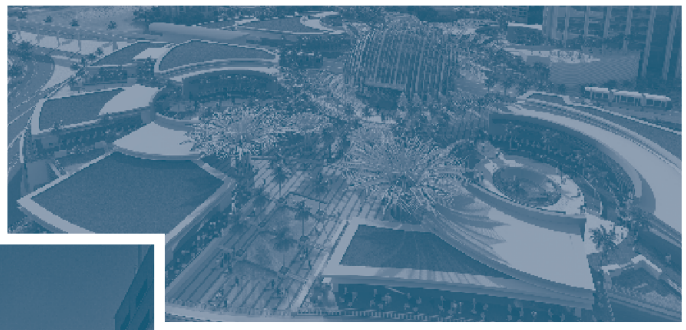


The Year in Infrastructure 2016

Outstanding Structural Engineering Projects

Finalists and Winner for the Be Inspired Award

INFORMED INFRASTRUCTURE
The *construction engineer's* source for projects, products and technology

Bentley®
Advancing Infrastructure

Bentley Systems and *Informed Infrastructure* are pleased to present the Finalists and Winner for the 2016 Be Inspired Award for Innovation in Structural Engineering.

I've been to most of the Be Inspired Awards and Year in Infrastructure events, and each one finds a way to top the year before. The event is expanding and traveling to Asia next year, being held in Singapore from Oct. 10-12, 2017, but London again was an amazing backdrop to the annual showcase in November 2016 (my picture below is from a social event in London).

The suite of Bentley Systems' software evolves and improves every year, with different types of developers using different products tailored to their needs. Some projects are small, and some are truly massive in scale, but they all find ways to deliver better designs, models and projects with substantial savings in time and money via technology advancements.

Having been a juror at these events, and talking with many other jurors through the years, it's evident that the Be Inspired Award winners (and many that don't win) are truly inspirational to those working on similar projects as well as those who work for Bentley Systems. The companies and projects in this showcase have earned and deserve this lofty recognition.

We hope that by partnering with Bentley Systems and providing a global platform for the Structural Engineering Finalists and Winner, other firms and industry leaders can learn from these examples and apply these cutting-edge techniques in their own work. If imitation is the sincerest form of flattery, I believe all these project teams will appreciate anyone following their lead to better the profession (and structures) for all to gain.

I also hope this showcase inspires more of our readers to submit their own projects for the 2017 event. I'm extremely excited to visit Singapore and its forward-thinking infrastructure investments. I hope you'll join us there.

Todd Danielson,
Editorial Director

V1 Media and
Informed Infrastructure magazine

I'm continually impressed by the amazing projects our users execute on each year, and the finalists and winners of Be Inspired 2016 were no exception.

With 22 Bishopsgate, the team from WSP Parsons Brinckerhoff had to consider dozens of full building alternatives for a landmark structure developed around the remnants of a previous design. Utilizing Bentley's Integrated Structural Modeling (ISM) to share information with RAM Structural, RAM Concept and third-party products, they were able to deliver an optimal design for a highly constrained site.

Estaco S.A. designed a 12-story, vertical, automated parking structure located on top of an existing multistory parking garage. The seismic dynamic behavior of the critical connection forces was calculated using STAAD.Pro.

Using unique built-up sections created in STAAD's Sectionwizard, Rasana Engineering designed multiple structures for the Nakheel Mall on Palm Jumeirah. This included an impressive Crystal Plaza dome servicing as a tram station as well as multiple cantilever-span palm-tree shade canopies.

We always look forward to sharing with our users the product advancements realized in the preceding year. Advancements in analytical cloud services delivered through the Optioneering Center was a hot topic. With Scenario Services, engineers now can take advantage of the cloud to easily perform large-scale analyses and comparative studies for STAAD and SACS. Analytical Insights is the first service of its kind in our industry, allowing firms to capture the collective knowledge of their experience to automate quality assurance and control processes.

We at Bentley strive to help solve engineering and workflow challenges to make users more efficient, productive and profitable. We're excited to showcase these outstanding projects, and we welcome your submissions for consideration next year.

Raoul Karp

Vice President, Development,
Analytical Modeling Group
Bentley Systems

WINNING PROJECT

WSP Parsons Brinckerhoff

22 Bishopsgate, London

The tallest building in London's financial district will soon be 22 Bishopsgate, a 278-meter skyscraper designed by PLP Architecture. The 62-story tower will feature 120,000 square meters of office space as well as retail, medical and education facilities. WSP Group of WSP | Parsons Brinckerhoff provided multi-discipline services, including structural design of the entire building. WSP's main challenge was using a foundation constructed for a previous design.

Using RAM Structural System, WSP generated multiple schemes for the steel work, and material take-offs and drawings for final design. RAM Concept enabled WSP to retain much of the existing basement construction in raft foundation and floor slab designs. Linking RAM to Revit through Bentley Integrated Structural Modeler enabled drawing and model generation. Bentley technology reduced overall structural design time by 40 percent on this GBP 1.5 billion project.

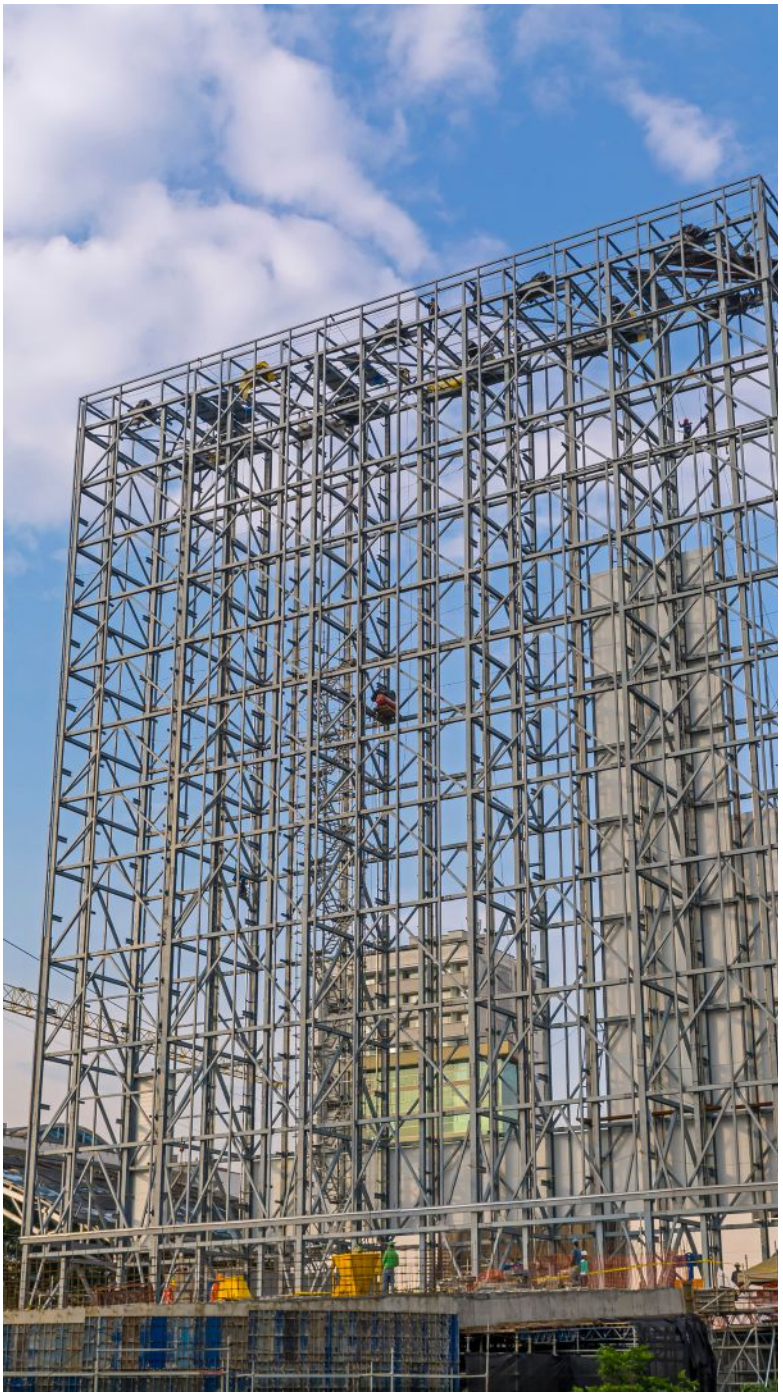
FINALIST

Estaco S.A.

Oviedo Automatic Parking System

The USD 11 million Oviedo Automatic Parking System solved the severe parking shortage at the expanding Oviedo Shopping Mall in Medellín, Antioquia, Colombia. Designed by Estaco, a Colombian engineering company dedicated to the design, manufacture and assembly of metal structures, the unmanned, automated parking system provided parking for 210 vertically stacked vehicles within an existing reinforced concrete building.

Estaco used STAAD.Pro to simulate design scenarios in which the metal building and its electro-mechanical components could be installed without compromising the concrete building's structural integrity. An integrated model of the metal and concrete structures validated the scheme for concrete reinforcement, steel structure erection and metal-concrete connection. STAAD.Pro produced the models required for the stringent third-party structural review and certification. The innovative design met expectations for cost, operational speed and safety.



FINALIST

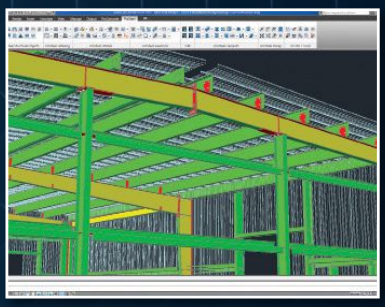
Rasana Engineering Co. LLC

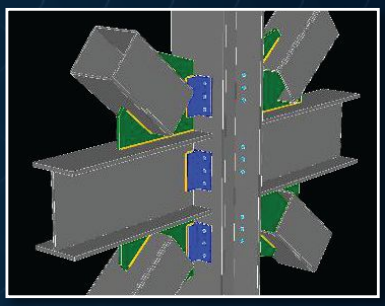
Nakheel Mall on Palm Jumeirah

In Palm Jumeirah, an artificial archipelago off the coast of Dubai in the United Arab Emirates, the AED 2 billion Nakheel Mall project is a 418,000-square-meter complex with hotel, shopping, cinemas, medical center and fitness complex. A monorail station and 4,000 underground parking spaces provide ample transportation options. Rasana Engineering Industries was the sole steel contractor on the project.

Rasana used STAAD for analysis and design of all the steel structures, and Sectionwizard for irregular built-up shapes. Tekla models were imported to STAAD, and the STAAD Advanced Analysis module accelerated the analysis process. Bentley applications helped economize on a majority of sections, resulting in a 15 percent savings in design time. The quick analysis helped Rasana deliver the construction drawings on time and within budget.

Strong Structures Come From Strong Designs





With RAM™, STAAD® and ProStructures, Bentley offers proven applications for:

- Metal Buildings
- Steel/Steel Composite
- Aluminum
- Reinforced Concrete
- Foundation Design
- Steel Connections
- Structural Drawings and Details

… all easily coordinated with the Architect and other team members and their design applications – such as AutoCAD, Revit, MicroStation® and more.

Build it with Bentley! Integrated projects, teams and software.

Bentley's Structural Software provides you the tools you need for strong designs and supports an integrated workflow all the way around. Having all the applications you need for the tasks at hand, along with the ability to easily synchronize your work with the rest of the project team, helps you get your job done right, fast and profitably.

Visit www.bentley.com/Structural to learn more!

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