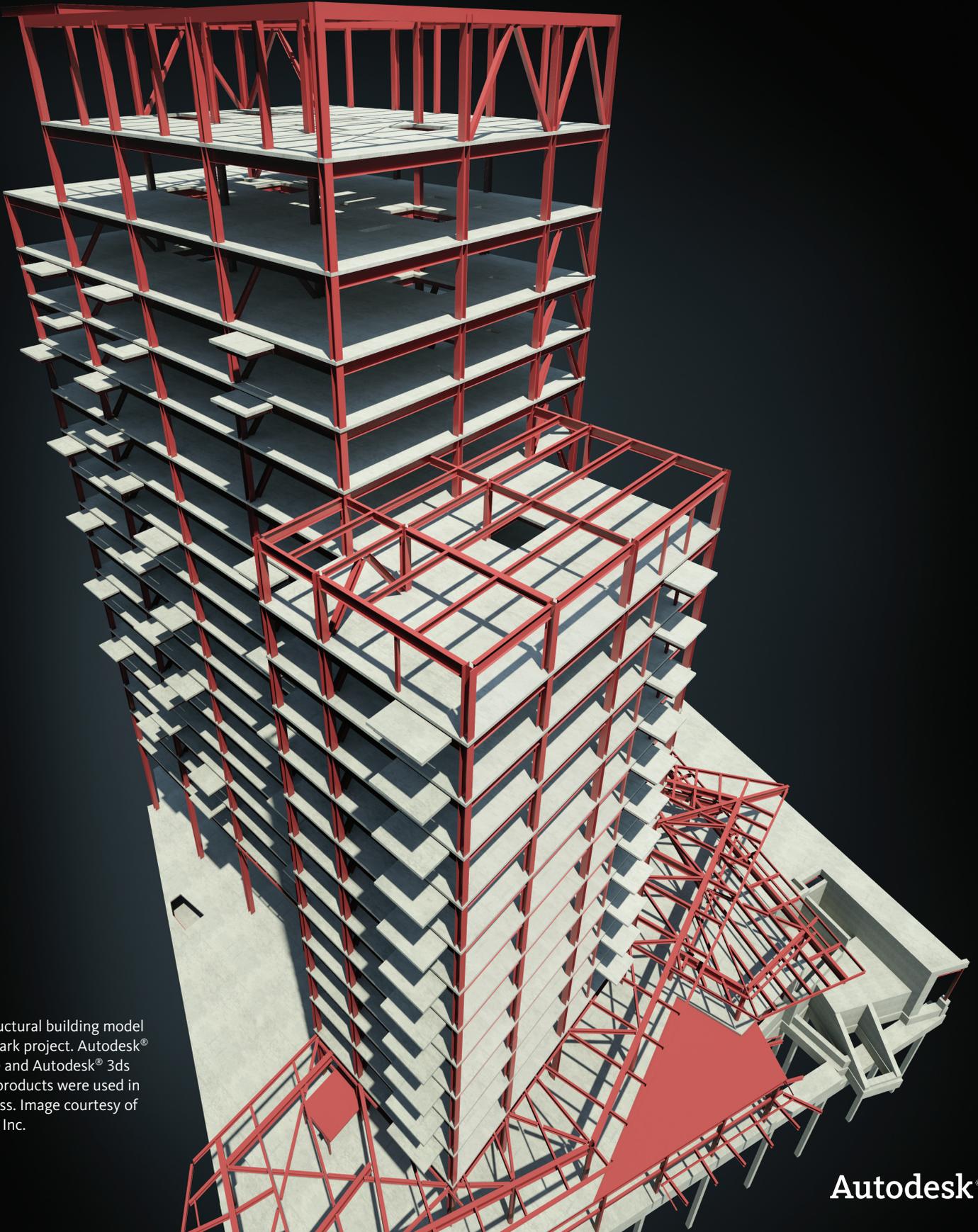


Design, visualize, simulate, document, and build.  
The Power of BIM for  
Structural Engineering



Rendering of structural building model for Waterplace Park project. Autodesk® Revit® Structure and Autodesk® 3ds Max® software products were used in the design process. Image courtesy of Odeh Engineers, Inc.

# Work More Efficiently, Accurately, and Competitively

## Industry Challenges Bring New Opportunities.



By sharing our Revit design models, we could more accurately visualize the project and understand the spatial relationships between the structural framing, the architectural elements, and the building systems.

—David J. Odeh  
Principal  
Odeh Engineers

### What if you could?

- Meet new BIM mandates from architects, building owners, and government agencies
- Control costs and do more with less
- Be more competitive
- Profit from streamlined design workflows that allow you to deliver on time and on budget

Image courtesy of Odeh Engineers.

In today's fragile global economy, structural engineers face numerous challenges. In many parts of the world, spending on new construction projects has plummeted—provoking fierce competition among those firms left standing after industry closures and consolidation. Other regions, most notably China and India, have provided abundant work, but only to those firms capable of securing projects on an international scale and collaborating with geographically dispersed project team members.

On virtually all projects, savvy clients and project owners are demanding more for less. What if you could deliver innovation and a return on investment to your clients and measure that with quantitative cost and time savings? What if you could deliver value in other abstract ways, such as improved constructability, greater end-user productivity, and owner satisfaction? Your clients will also be looking to help ensure safety across the project lifecycle—a consideration that encompasses everything from compliance with seismic building codes to off-site prefabrication of critical building components. What if you could meet and exceed these expectations?

Today structural engineering firms can take advantage of breakthrough technologies, such as cloud and mobile computing. These solutions are transforming how design teams work together. Structural engineers must also stay abreast of industry shifts toward new contractual structures—particularly integrated project delivery (IPD), in which many project stakeholders (not just the owner, architect, and contractor) share a project's risks and rewards. This approach necessitates early and ongoing collaboration and coordination among all project team members.

### BIM for Structural Engineering

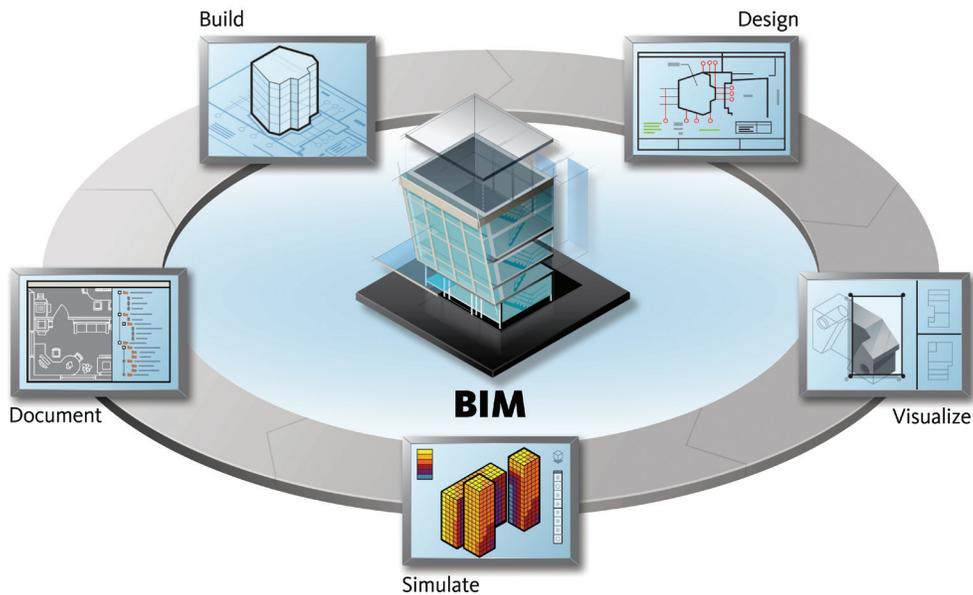
To help maintain a competitive edge and stay profitable in this challenging business climate, structural engineering firms—from large multinationals to smaller scale businesses—are adopting new workflows, tools, and technologies. One of the most prominent of these is Building Information Modeling, or BIM.

BIM is an intelligent model-based process that provides insight for creating, managing, and delivering building projects faster, more economically, and with reduced environmental impact. With help from BIM, structural engineers and other building industry professionals can create consistent, coordinated design models and use the information within them to visualize, simulate, and analyze project performance, appearance, and cost throughout the entire project lifecycle. This approach helps project teams more quickly detect coordination problems and achieve more predictable outcomes.

Demand for BIM is growing rapidly, particularly among building owners and government agencies, many of which now mandate BIM use on their projects. Among building industry professionals, architects were the first to adopt BIM in large numbers based on quickly realizing the benefits a BIM methodology provides, and many other building industry professionals, including structural engineers, are now adopting BIM and realizing its benefits.

### Autodesk Structural Engineering Solutions

To help structural engineers and other building industry professionals take advantage of the information rich intelligent models and support an end-to-end BIM workflow, Autodesk offers a comprehensive portfolio of products, solutions, and services. These offerings support BIM and AutoCAD®-based workflows across the entire structural engineering project lifecycle, and help structural engineers design, visualize, simulate, analyze, document, and build projects more efficiently, accurately, and competitively.



At the heart of the Autodesk BIM process are intelligent information-rich models that can be used for design, analysis, and documentation as well as extended into the fabrication and construction processes. Using BIM, structural engineers can:

#### Create Better Buildings Using More Coordinated and Consistent Information

- Design more efficiently with intuitive structural engineering tools that support the BIM process and help improve accuracy and reduce errors
- Optimize outcomes by exploring design alternatives more easily and cost effectively during conceptual design
- Drive intelligent information throughout the project lifecycle, connecting structural design intent with analysis and fabrication.
- Document designs more accurately using coordinated and more consistent information inherent in the intelligent models

#### Gain Project Insight through Design, Visualization, and Simulation

- Use BIM-based tools to create intelligent, 3D model-based designs
- Gain efficiency and help reduce drawing rework by extending intelligent structural engineering models to drive fabrication
- Minimize waste and total embodied energy by using analysis and material takeoff tools to create more efficient, more predictable structural designs
- Improve predictability with analysis tools to experience a project's real-world structural performance digitally, before it's built
- Produce compelling visualizations to present ideas more clearly—helping teams communicate more effectively, obtain stakeholder approvals, and win new business

#### Collaborate More Effectively to Help Inform Design and Construction Decisions

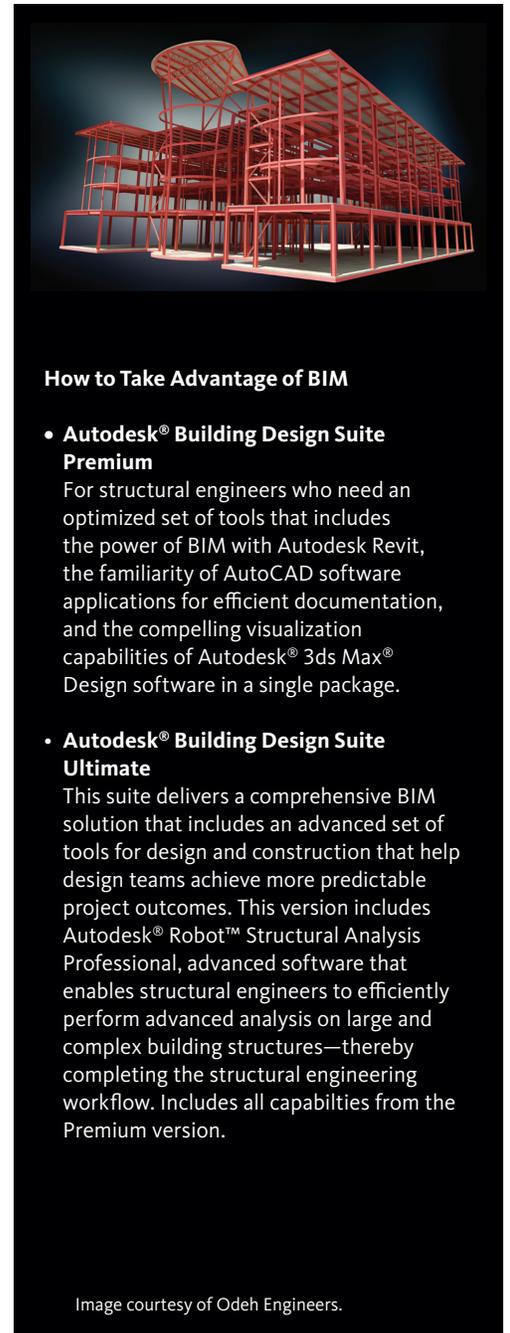
- Document designs more accurately based on more coordinated and consistent information
- Optimize collaboration by sharing digital information with steel detailers, fabricators, and contractors, helping to decrease construction time for steel and concrete structures
- More accurately manage project data across the project lifecycle and among numerous team members

#### Multiple Tools—One Powerful Solution

Autodesk® Building Design Suite Premium or Ultimate Edition offers a broad range of tools including Autodesk® Revit® software and the familiarity of AutoCAD software, as well as cloud-based services to help structural engineers design, visualize, simulate, document, and build better projects.

#### Extend Your Desktop—Transform the Way You Work

In addition to the Building Design Suite, the Autodesk solution for collaboration and data management provides extended teams with secure, easy-to-use and fast-to-deploy collaboration and data management solutions, making project information accessible to anyone, anytime, anywhere. The Autodesk solution for collaboration and data management helps put structural engineers and other building professionals in control of business processes and workflows for increased efficiency, improved profitability, and higher quality outcomes.



#### How to Take Advantage of BIM

- **Autodesk® Building Design Suite Premium**  
For structural engineers who need an optimized set of tools that includes the power of BIM with Autodesk Revit, the familiarity of AutoCAD software applications for efficient documentation, and the compelling visualization capabilities of Autodesk® 3ds Max® Design software in a single package.
- **Autodesk® Building Design Suite Ultimate**  
This suite delivers a comprehensive BIM solution that includes an advanced set of tools for design and construction that help design teams achieve more predictable project outcomes. This version includes Autodesk® Robot™ Structural Analysis Professional, advanced software that enables structural engineers to efficiently perform advanced analysis on large and complex building structures—thereby completing the structural engineering workflow. Includes all capabilities from the Premium version.

Our skill with Revit Structure and BIM has definitely given our company a competitive advantage. We are building all of our processes around Revit Structure and BIM.

—Brett Taylor  
Director  
Bornhorst + Ward

#### **Learn More or Purchase**

Access specialists worldwide who can provide product expertise, a deep understanding of your industry, and value that extends beyond your software. To license Autodesk® Revit® software products, Autodesk® 360, or Autodesk® Building Design Suite, contact an Autodesk Authorized Reseller. Locate an Autodesk Reseller near you at [www.autodesk.com/reseller](http://www.autodesk.com/reseller)

#### **Autodesk Education**

Autodesk offers students and educators a variety of resources to help ensure that students are prepared for successful design careers. Educators can access design software, curricula, and teaching resources, while students can access free\* software, training videos, design competitions, and career resources. Anyone can get expert guidance at an Autodesk Authorized Training Center (ATC®) site, and validate skills with Autodesk Certification. Learn more about Autodesk Education at [www.autodesk.com/education](http://www.autodesk.com/education)

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