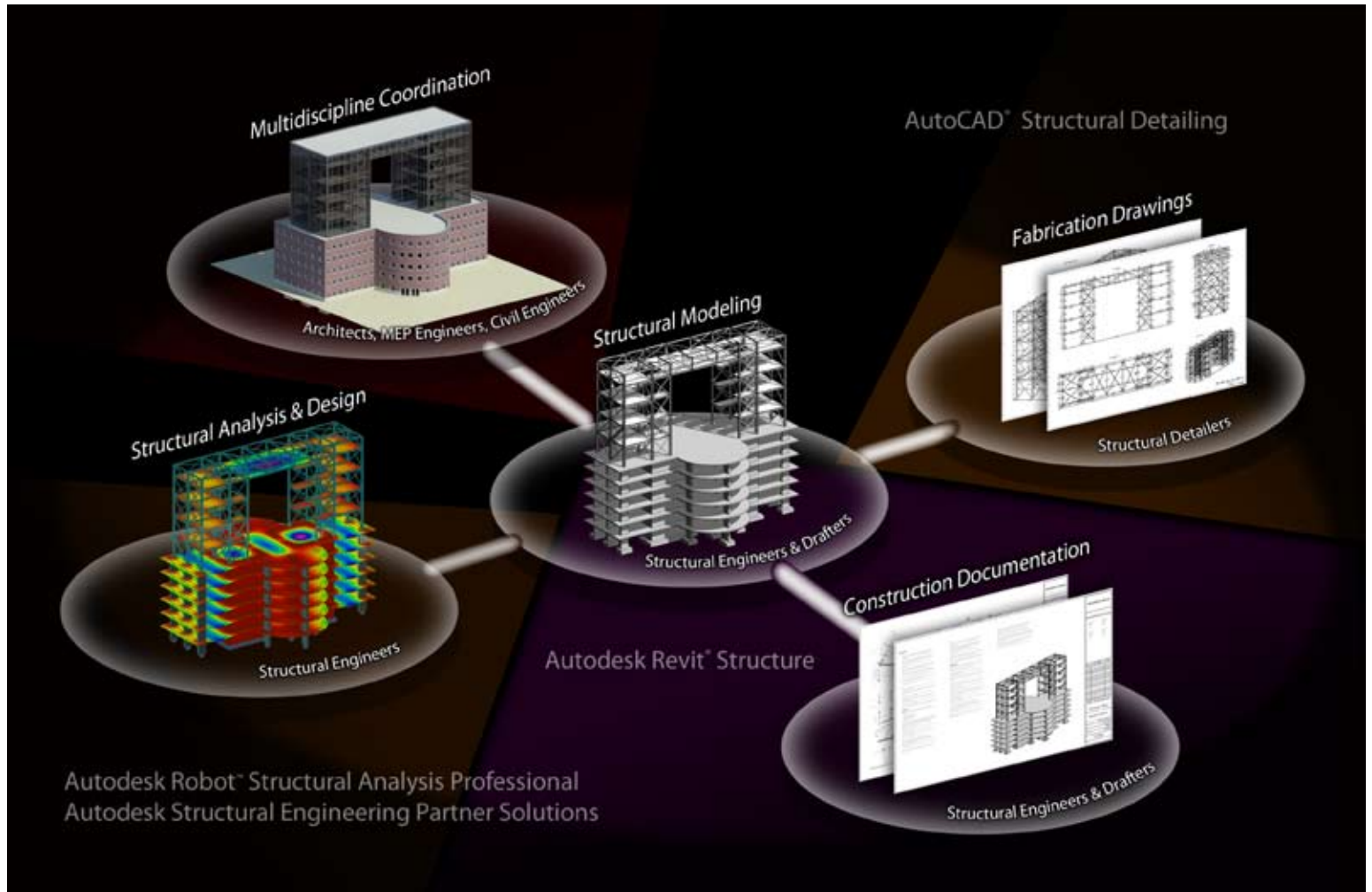


# Building Information Modeling for Structural Engineering

Integrated tools for modeling, coordination, analysis, design documentation, as well as shop drawings and fabrication.



Building information modeling (BIM) is an integrated process built on coordinated, reliable information about a project from design through construction and into operations. By adopting BIM, architects, engineers, contractors, and owners can more easily create coordinated, digital design information and documentation; use that information to visualize, simulate, and analyze performance, appearance, and cost; and reliably deliver the project faster, more economically, and with reduced environmental impact.

BIM for structural engineers follows this same methodology for the entire structural engineering process, focusing on a digital model that can be used for coordination with architects; mechanical, electrical, and plumbing engineers; and civil engineers that is integrated with analysis, design, and construction documentation, and extending that digital model from design through fabrication and construction.

#### Autodesk Revit Structure

Autodesk<sup>®</sup> Revit<sup>®</sup> Structure software integrates multimaterial physical and analytical models, providing concurrent structural modeling for more efficient, more up-to-date documentation, as well as tight integration for analysis and design.

#### Autodesk Robot Structural Analysis Professional

Autodesk Robot Structural Analysis Professional software is a collaborative, versatile, and fast structural analysis and design application that incorporates BIM, allowing engineers to readily analyze a wide variety of structures.

#### AutoCAD Structural Detailing

AutoCAD<sup>®</sup> Structural Detailing software is a powerful solution for faster and efficient detailing and creation of fabrication shop drawings for reinforced concrete and steel structures.

We have been using Robot Millennium software for more than 10 years because of its analysis performance as well as its design versatility for reinforced concrete, steel, and wood structures. We are looking forward to moving to Autodesk Robot Structural Analysis software and becoming even more productive and competitive.

—Grzegorz Bałd  
Vice President and Technical Director  
Biprostal SA Engineering and Consulting, Poland

#### **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 purchase. To purchase Autodesk Robot Structural Analysis Professional software, contact an Autodesk Premier Solutions Provider or Autodesk Authorized Reseller. Locate a reseller near you at [www.autodesk.com/reseller](http://www.autodesk.com/reseller).

To learn more about Autodesk Structural Engineering Solutions, visit [www.autodesk.com/building](http://www.autodesk.com/building).

#### **Autodesk Learning and Education**

From instructor-led or self-paced classes to online training or education resources, Autodesk offers learning solutions to fit your needs. Get expert guidance at an Autodesk Authorized Training Center (ATC<sup>®</sup>) site, access learning tools online or at your local bookstore, and validate your experience with Autodesk certifications. Learn more at [www.autodesk.com/learning](http://www.autodesk.com/learning).

#### **Autodesk Services and Support**

Accelerate return on investment and optimize productivity with innovative purchase methods, companion products, consulting services, and support from Autodesk and Autodesk authorized partners. Designed to get you up to speed and keep you ahead of the competition, these tools help you make the most of your software purchase—no matter what industry you are in. Learn more at [www.autodesk.com/servicesandsupport](http://www.autodesk.com/servicesandsupport).

#### **Autodesk Subscription**

Get the benefits of increased productivity, predictable budgeting, and simplified license management with Autodesk<sup>®</sup> Subscription. You get any new upgrades of your Autodesk software and any incremental product enhancements, if these are released during your Subscription term. In addition, you get exclusive license terms available only to Subscription members. A range of community resources, including web support direct from Autodesk technical experts, self-paced training, and e-Learning, help extend your skills and make Autodesk Subscription the best way to optimize your investment. Learn more at [www.autodesk.com/subscription](http://www.autodesk.com/subscription).

Rendering courtesy of SCA Consulting Engineers.

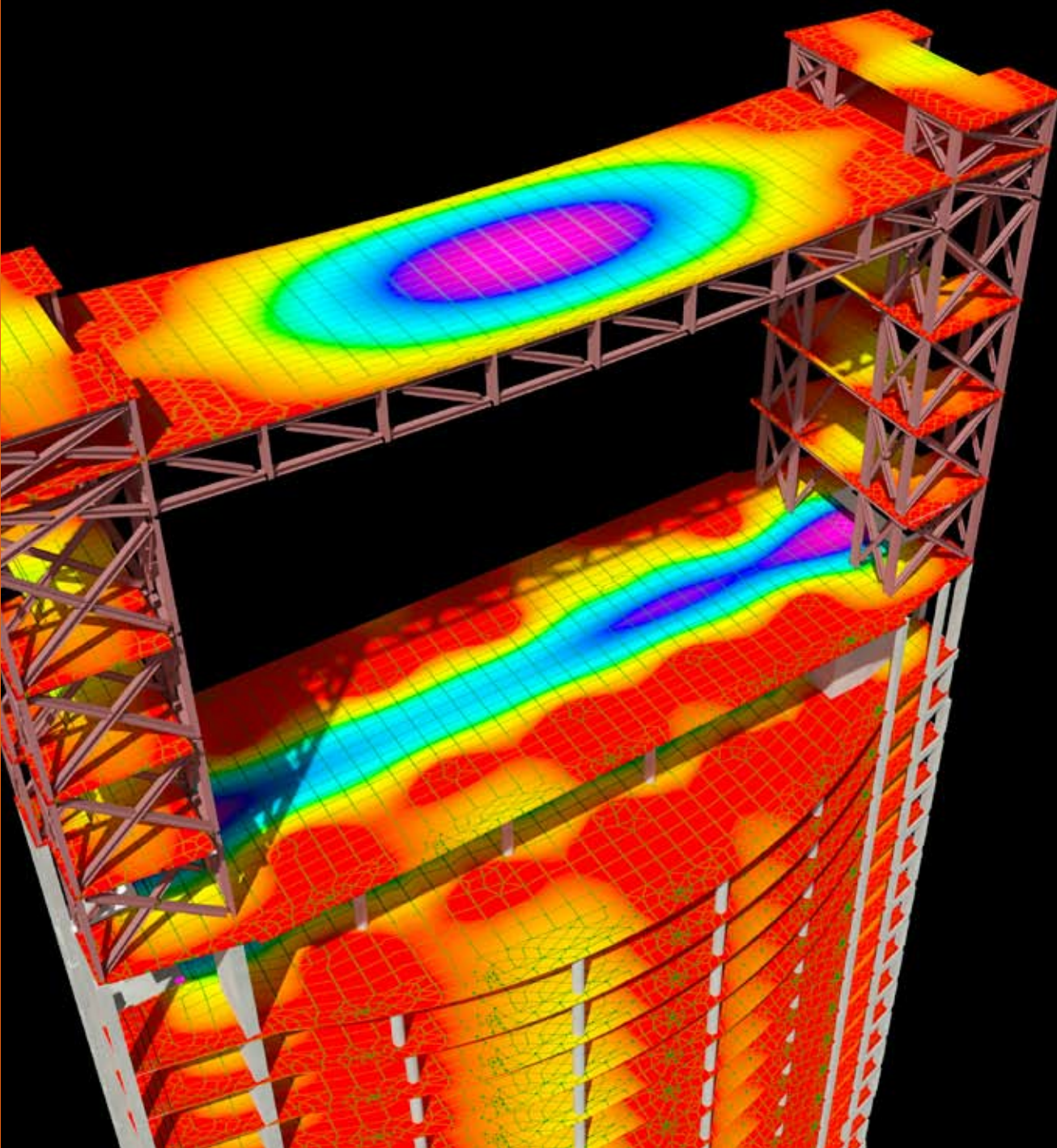
Autodesk, AutoCAD, ATC, Revit, and Robot are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings and specifications at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2009 Autodesk, Inc. All rights reserved. BR0A1-000000-MZ57

**Autodesk®**

Robot™ Structural Analysis  
Professional 2010

Break it down before you build it up.



Autodesk®

# Enhanced Collaboration and Workflow Made Easy

Autodesk Robot<sup>®</sup> Structural<sup>™</sup> Analysis Professional software complements building information modeling (BIM) with coordinated digital analysis and design.

Autodesk Robot Structural Analysis Professional is a collaborative, versatile, and fast software application that can help you compete and win in the global economy. Purpose-built for BIM, Autodesk Robot Structural Analysis Professional calculates even your most complex models with powerful finite element auto-meshing, nonlinear algorithms, and a comprehensive collection of design codes to help you achieve results in minutes, not hours. Autodesk Robot Structural Analysis Professional offers seamless, collaborative workflow and interoperability with 3D bidirectional links to Autodesk companion products. The open API (application programming interface) provides a scalable, country-specific analysis solution for a range of structures, including buildings and bridges, and civil and specialty structures.

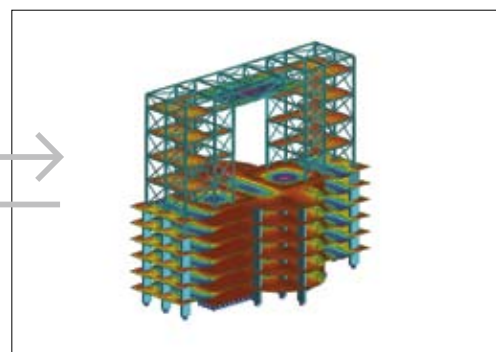
## Subscription Benefit

As an exclusive subscription benefit, Robot<sup>™</sup> Extensions for Autodesk Robot Structural Analysis Professional extend the capabilities of Autodesk structural analysis tools, providing structural engineers with even more flexibility to achieve their results. The spreadsheet calculator extension enables engineers to link analysis results into customizable spreadsheets for postprocessing. Users can integrate existing spreadsheets into this environment or create new applications. Simple tools are available that allow users to extract a large range of data from Autodesk Robot Structural Analysis Professional, and no special programming experience is required.

**Modeling in Autodesk Revit Structure**



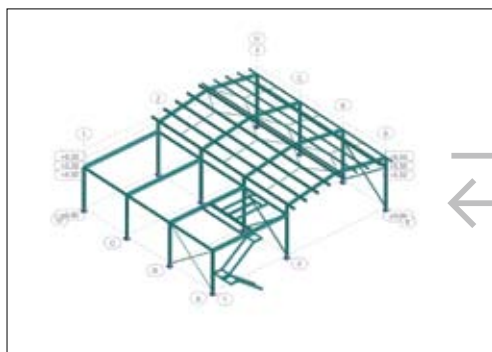
**Structural Analysis in Robot Structural Analysis**



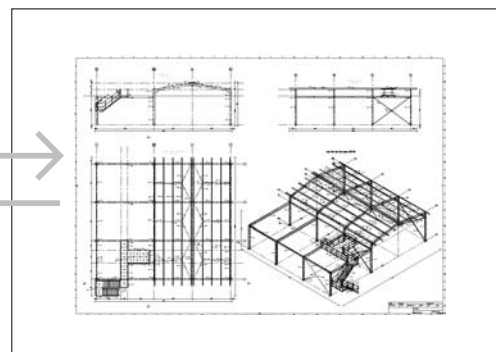
## Bidirectional Links with Autodesk Revit Structure

Experience the powerful bidirectional integration of Autodesk Robot Structural Analysis Professional and Autodesk<sup>®</sup> Revit<sup>®</sup> Structure software. Seamlessly import and export structural models between the two applications by using the Revit<sup>®</sup> Extensions analysis link. Bidirectional linking enables accurate structural analysis and design results to be updated throughout the building information model for coordinated construction documentation.

**Structural Analysis in Robot Structural Analysis**



**Shopdrawings Created with AutoCAD Structural Detailing**



## From Analysis to Fabrication Drawings

Structural engineers using Autodesk Robot Structural Analysis Professional can benefit from the ability to seamlessly transfer select design data to AutoCAD<sup>®</sup> Structural Detailing software, providing an integrated workflow from analysis through design to final project documentation and structural drawings.

# Fast Simulation and Calculations of Complex Structures

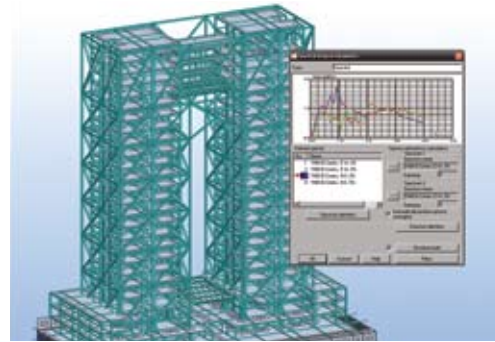
Autodesk Robot Structural Analysis Professional software is a powerful analysis application with exceptional finite element auto-meshing capabilities that can deliver fast and up-to-date results.

We're very pleased with Autodesk Robot Structural Analysis Professional, which combines powerful advanced analysis capabilities with the multimaterial design expertise in one structural software package. Without a doubt, this solution helps us better respond to our clients' challenges and also stay more competitive.

—David Monti  
Principal, Structural Engineer  
GP Structures

## Modeling, Analysis, and Design

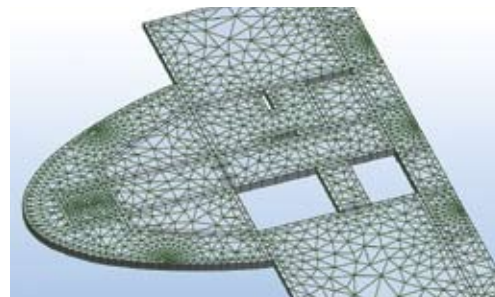
Autodesk Robot Structural Analysis Professional can analyze a wide range of structures, but it includes an intuitive user interface specifically created for the modeling, analysis, and design of buildings. The building design layout includes floor plane views to easily create columns and generate beam framing layouts. Engineers can use tools to efficiently add, copy, remove, and edit geometry for similar building stories.



Wide Range of Analysis Capabilities

## Advanced Auto-Meshing and Modeling

Autodesk Robot Structural Analysis Professional is a robust structural analysis software application with powerful mesh generation techniques that enable structural engineers to effortlessly work with even the most complex models. Automatic mesh definition tools allow for manual manipulation of the mesh, refinement, and meshing around openings of any shape and size. The many meshing tools available enable structural engineers to quickly create a high-quality finite element mesh on virtually any shape of structure.



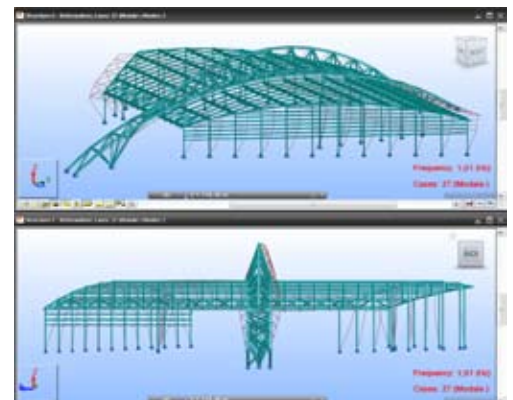
Advanced Auto-Meshing and Modeling Capabilities

## Analysis Capabilities

While Autodesk Robot Structural Analysis Professional is a powerful, easy, and efficient tool for general linear static analysis, it also equips structural engineers with the ability to go beyond the traditional analysis capabilities of other software programs. Engineers can explore design alternatives and investigate the linear and true nonlinear behavior of a structure. The software allows the simple and effective analysis of many types of nonlinearity, including P-delta analysis, tension/compression members and supports, cables, and plastic hinges, just to name a few. Autodesk Robot Structural Analysis Professional provides market-leading tools for the dynamic analysis of structures, and high-level fast dynamic solvers ensure that dynamic analysis can be easily carried out for any size of structure.

## Analysis Solvers

Autodesk Robot Structural Analysis Professional includes state-of-the-art solvers to deliver fast processing of even the largest structural models. These analysis algorithms, based on advanced technology, enable engineers to deliver accurate results fast, helping them to easily optimize and reanalyze structures and explore a variety of structural configurations.



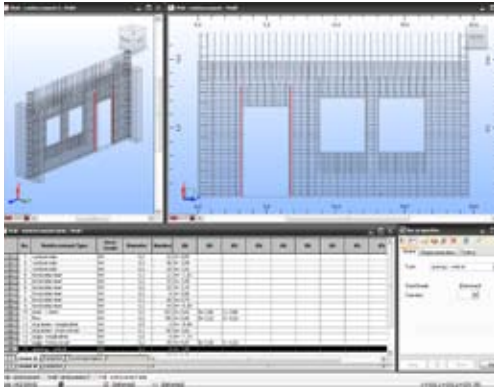
State-of-the-Art Analysis Solvers

# Unmatched Versatility and Region-Free Analysis

Autodesk Robot Structural Analysis Professional software is a comprehensive global analysis application with an open API, delivering flexibility to analyze and design a broad range of structures.

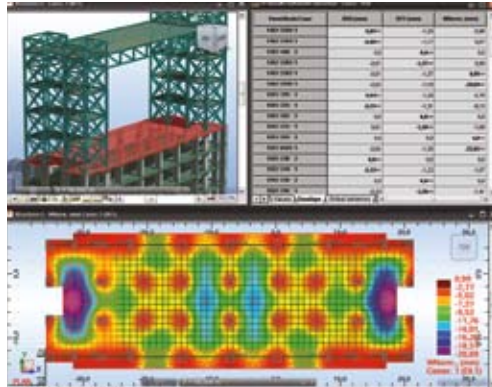
## Reinforced Concrete and Steel Design Solution

Autodesk Robot Structural Analysis Professional contains integrated reinforced concrete and steel design modules based on more than 40 international steel codes and 30 reinforced concrete codes, simplifying the design process, and assisting engineers with selecting and verifying structural elements.



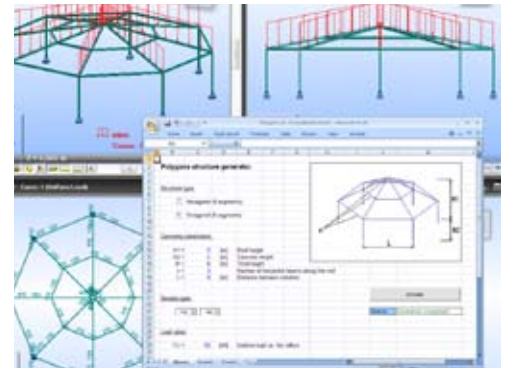
## Extensive Output of Analysis Results

Autodesk Robot Structural Analysis Professional provides wide flexibility in obtaining analysis results. Results may be viewed on individual members, parts of the structure, or for the structure as a whole in the forms of diagrams and maps. Tabular results may be easily filtered to show specific data and easily output to spreadsheets for user postprocessing of data.



## Extending Capabilities with an Open API

The concept of linking applications together to provide a single solution is not new, but few solutions offer the practical approach of Autodesk Robot Structural Analysis Professional. This program utilizes component object model (COM) technology as introduced by Microsoft, allowing the solution to be open architecture and openly programmable by any engineer. The open and flexible API offers an extensive list of possibilities, including integrating Autodesk Robot Structural Analysis Professional software with external programs, such as Microsoft Excel® software, Microsoft Word, and AutoCAD® software; extracting results from Autodesk Robot Structural Analysis Professional; writing postprocessing software, such as special codified analysis for steel, concrete, timber, and aluminum; and the ability to create parametric structures in Autodesk Robot Structural Analysis Professional.



## International Design Codes

Autodesk Robot Structural Analysis Professional includes more than 60 sections and materials databases from around the world, enabling international projects to be completed with ease. With 70 built-in design codes for an array of countries, structural engineers can work with country-specific section shapes, imperial or metric units, and country-specific building codes within the same integrated model.

## Multilingual for Global Markets

Compete in the global market with Autodesk Robot Structural Analysis Professional. The software supports multinational design teams by providing many languages, including English, French, Romanian, Spanish, Russian, Polish, Chinese, and Japanese. Structural analysis can be performed in one language and output can be generated in another, providing versatility among global teams. Imperial and metric units can be used in combination within the same structural model, providing adaptability to varying environments.

The printout composition feature provides the ability to save tables and model views in a user-defined layout. Results and maps saved in this layout are automatically refreshed after model changes. Printouts can be made directly from printout composition or can be presented in Microsoft® Word editor HTML format.

