Take Control of Your Structural Projects

See how easy your project lifecycle can be

Work Your Way with RAM

Bentley®

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The Challenge

Structural engineers today must consider many different material options and structure types for any given project. They need to design structural framing, lateral systems, shear walls, diaphragms, concrete slabs and foundations, as well as steel connections, all in accordance with current standards and in relation to the other parts. They must consider alternatives to provide the most economical and resilient structure overall.

Engineers must coordinate with architectural designs that rapidly evolve. Their software needs to be integrated and easy to adjust.

The right digital solution should help engineers design structures from top to bottom, with the flexibility to adjust and reevaluate many alternatives. With numerous international design standards included, innovative software can support projects around the globe.

The Solution

Bentley's RAM software products perform the heavy lifting with a complete solution for analysis, design drafting, and documentation for steel and concrete buildings and foundations. RAM can help you save time, maintain standards and code compliance, manage designs, easily export and share your designs, and integrate with other software.

You can use RAM software products throughout your engineering workflows:

◆ Planning & Modeling
◆ Analysis
◆ Design & Optimization
◆ Reporting
◆ Integration
◆ Design Review

PLANNING & MODELING

Throughout the project, it is crucial to work from the most current plans. RAM enables you to quickly generate a structural model from floor plan layouts or create full 3D building models from a BIM model using iTwin Analytical Synchronizer. With RAM you can:

- Rapidly build models with an intuitive user interface

- Easily import data from iTwin Analytical Synchronizer and other file types

- Quickly adjust for layout changes or changes to the structural materials or systems
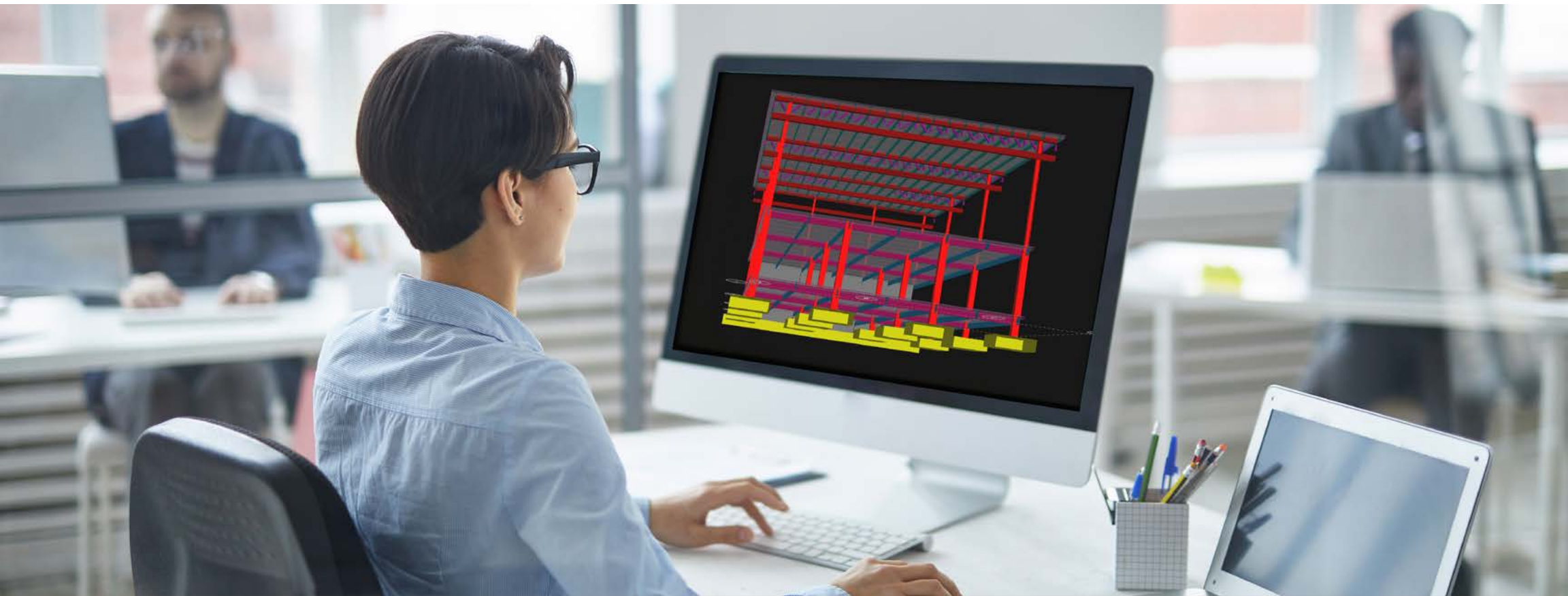
ANALYSIS

Analyzing building structures for all the environmental and accidental loads is essential for building stability and resiliency. RAM software products make it easy to:

- Model gravity floor loads
- Analyze structures using a variety of analysis types, including tributary analysis and finite element analysis
- Consider notional loads or construction stage analysis
- Generate wind and seismic loads
- Perform response spectrum analysis
- Control building drift and floor vibrations

DESIGN & OPTIMIZATION

You can rely on RAM's comprehensive design optimization for economical and safe designs.

Gravity systems

- Steel framing systems including composite steel-framed floors
- Concrete slabs including post-tensioned concrete
- Concrete beam and slab systems

Lateral systems

- Shear walls
- Moment frames or braced frames including special seismic code provisions
- Specialty lateral systems like SidePlate, DuraFuse, CoreBrace, and StrongTie integrated design
- Diaphragms evaluation
- Tilt-up concrete walls

Connections

- Steel connections for both gravity and lateral systems

Foundations

- Spread footings
- Strip footings
- Mat foundations
- Pile cap foundations

REPORTING

Structural engineers must explain their designs to stakeholders including building departments, government agencies, or other engineers. RAM software products provide robust reporting for every part of the design.

- Reports can be customized according to company styles
- Summary reports or complete design reports can be produced
- Detailed material take-off reports are included
- Reports can be saved to a file
- Analysis and design data can be exported into standard database formats for further post-processing

INTEGRATION

Bentley's RAM and ADINA software products are tightly integrated to make your building design workflow clear and complete.
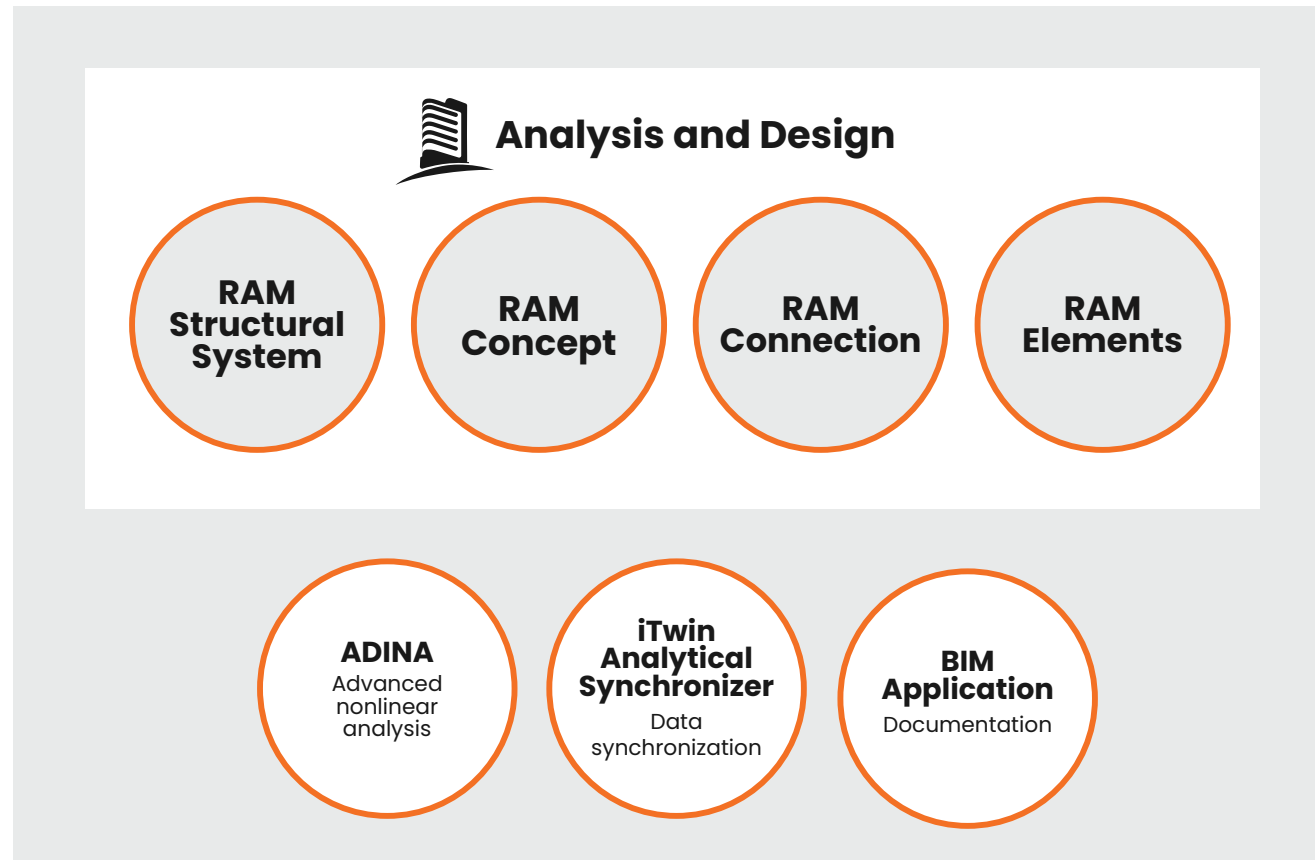
DESIGN REVIEW

There is an increasing need for project managers or other stakeholders to review current designs.

RAM software products can automatically generate CAD files or a 3D iTwin using iTwin Analytical Synchronizer, which is free for anyone to use. With the iTwin engineers can:

- Create engineering deliverables and BIM files
- Share structural design information with applications such as Revit, Tekla, and OpenBuildings
- Synchronize changes through the digital iTwin
- Coordinate with mechanical, plumbing, and electrical trades as well as perform clash detection
- Review element design status

RAM in Action

16-story Multipurpose Block Building
Ghana Institution of Engineering
Accra, Greater Accra, Ghana

This 16-story building in Ghana's capital city of Accra is a mixed-use space made up of hotel apartments, conference facilities, a swimming pool, and other amenities. The project improved accommodation challenges within the community. Ghana Institution of Engineering (GhIE) was responsible for structural design and faced difficulties transitioning between different usages throughout the various floors, compounded by a very tight timeline. Initial software applications did not have the modeling flexibility needed, requiring GhIE to find more flexible, interoperable structural design and analysis technology.

To accommodate the accelerated timeline and numerous modeling changes, GhIE selected Bentley's RAM and STAAD, providing a collaborative, interoperable structural modeling and analysis environment. Using Bentley's integrated applications streamlined workflows, reducing turnaround time to produce and share models by 60%, and design and analysis time by 80%. The digital solution improved modeling accuracy by 50% and helped increase return on investment by reducing resource hours by 50%.
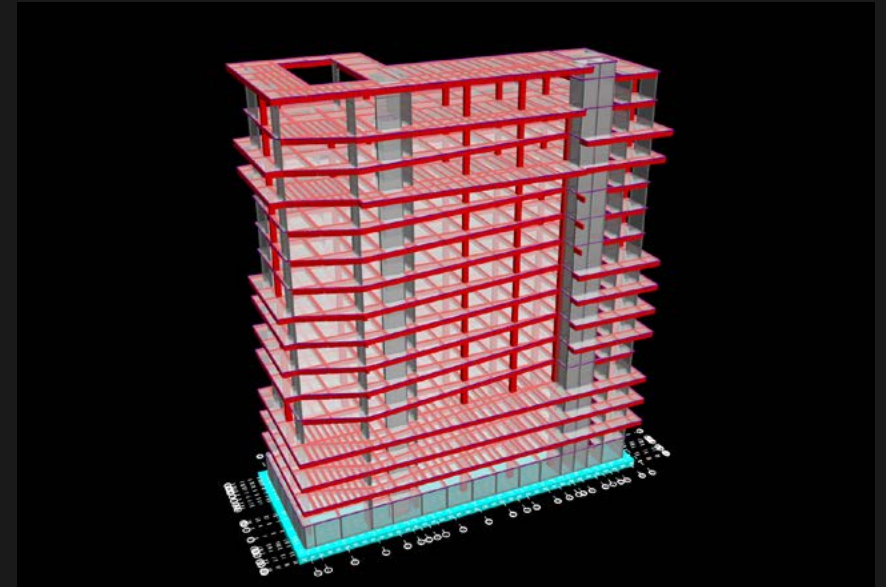
RAM in Action

Steven Tanger Center for the Performing Arts
SKA Consulting Engineers, Inc.
Greensboro, North Carolina, United States

Commissioned by the City of Greensboro, North Carolina, the Steven Tanger Center for the Performing Arts is a state-of-the-art facility with a 3,000-seat capacity, featuring tiered seating and balcony, orchestra pit, fore- and main stages, theatrical equipment, and support spaces. The USD 63 million center was designed by a team of experts, including SKA Consulting Engineers, Inc. (SKA) as structural engineer, construction administrator, and special inspector.

To promote communication among disciplines, SKA linked the team's BIM software, Revit, to RAM Structural System, which enabled SKA to look at structural components without remodeling, and solve coordination issues early in the project. Every aspect of the building structure was designed with RAM, which saved about three months in design time and reduced structural design fees by an estimated USD 60,000.

Work Your Way with RAM

Take advantage of a complete solution for analysis, design, drafting, and documentation for steel and concrete buildings, foundations, and even individual structural components, all in compliance with your local building codes.

With RAM, you will save time and money by automating the most tedious, repetitive, and time-consuming tasks so that you can focus on the more critical aspects of design and provide a cost-effective solution to your client.

To learn more, or to chat with a structural engineering expert, **click here**.

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