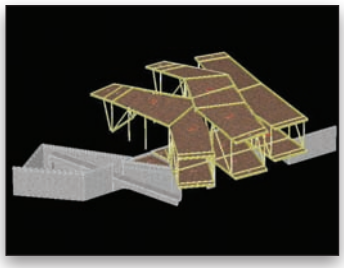
PRODUCT DATA SHEET

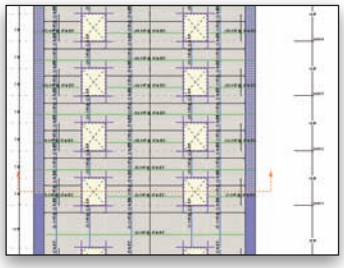
RAM™ ELEMENTS

THE STRUCTURAL ENGINEER'S TOOLKIT SYSTEM

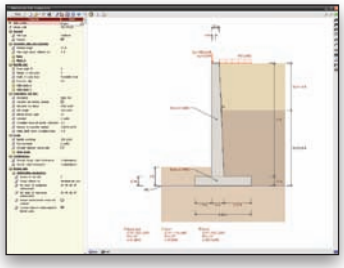
For analysis and design of almost any type of structure or structural component complete with sophisticated design tools to help you with your everyday analysis and design needs. RAM Elements delivers the industry's most productive and easy-to-use engineering analysis and design toolkit.



Multiple materials can be used in your RAM Elements models as shown in the residence in Topanga Canyon, CA. The Structural Engineer on this project was BW Smith Structural Engineers.



RAM Elements performs reinforced concrete shear wall design and graphically depicts the layout of the reinforcing.



Design of reinforced or unreinforced concrete and masonry retaining walls can be performed.

Unparalleled Flexibility from a Single Program

The only structural engineering software system that offers finite element analysis and design plus stand-alone or integrated design modules all in one low cost, easy-to-use package. RAM Elements is the only product that offers all of the features you need, such as designing beams and columns, concrete or masonry shear walls, retaining walls, tilt-up walls, continuous beams, footings, trusses — all with one familiar, easy to learn and use graphical interface.

Instead of using a stand-alone finite element program for frames, trusses, and other indeterminate structures, and one or more specialty programs or spreadsheets for your everyday design needs, use RAM Elements for all these tasks. This eliminates learning different programs for steel, concrete, masonry, wood, or cold-formed steel design and purchasing additional special purpose products for retaining walls or tilt-up walls. All the functionality you need is in one low-cost package.

Provides Comprehensive Structural Modeling

Finite element analysis and design offerings that can tackle most structural analysis problems. Utilized by thousands of engineering firms, RAM Elements provides unmatched productivity for modeling, optimizing, and designing structural elements and systems.

Dozens of modeling tools are available to make modeling even complex projects quick and easy. For increased flexibility, a user customizable desktop environment is provided so your favorite commands can be a mouse click away. Physical member modeling features allow users to design as engineers, not finite element specialists. The sophisticated design modules for structural elements such as retaining walls or isolated shear walls can be run as integrated with the finite element model or in stand-alone design mode. With our continuous enhancements RAM Elements provides confidence that our products are up to date with codes revisions.

Quickly Design a Single Structural Element

Easily design a single structural element such as a tilt-up wall, or utilize its integrated analysis and design capabilities to design these components as part of your 2-D or 3-D finite element model, which will bring all the information into the tilt-up wall design module automatically from the model.

Current design modules include: tilt-up walls, continuous beams, concrete shear walls, masonry walls with openings including lintel and column design, concrete spread footings, and concrete columns with interaction diagrams, trusses and retaining walls.

The tilt-up wall module will assist you in designing and detailing all rebar requirements, perform all the necessary design checks, and produce complete drawings in DXF format along with detailed reports designed to go directly into your structural calculations.

Customizable

Model quickly and accurately any way you choose using customizable features. RAM Elements allows you to personalize almost every part of the program to your needs or company standards and rules-of thumb. With 7 different ways to lay out nodes, 5 ways of modeling members, quick shell creation, import options, and plenty of tools to manipulate every object, you can quickly and accurately model to the detail and obtain the expected results. Customizable toolbars and personalized model views, display options, and units system are also available.

This allows for templates to be created easily for everyday design structures allowing you to save even more time on every project.

SYSTEM REQUIREMENTS

Processor:
Intel Pentium or AMD Athlon,

Operating System:
Windows Vista, XP, or higher (64 bit operating systems not fully exploited)

RAM:
1GB minimum, 2GB recommended

Hard Disk:
2GB available hard disk space required for analyzing models (180MB required for installation)

Display:
Open GL compatible graphics card with at least 128MB in video memory

1024x768 minimum screen resolution, Microsoft Internet Explorer 6.0 or higher, Latest OS service packs and graphics card drivers always recommended, System printer correctly installed, To install the software, administrative rights are absolutely necessary

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

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Bentley® Sustaining Infrastructure

RAM ELEMENTS AT-A-GLANCE

Analysis

- Dynamic analysis (Eigenvalue and Response Spectra) with CQC, SRSS, and ABS methods
- Iterative non-linear P-Delta analysis, 2nd order analysis
- Tension only members
- Compression only springs
- Flexible or rigid floor diaphragms
- Prismatic and real tapered (correct finite element with exact stiffness) member analysis
- In-plane and out-of-plane stresses in shells
- Allows imposed nodal displacements
- Import of DXF, RAM Structural System, and STAAD.Pro® files

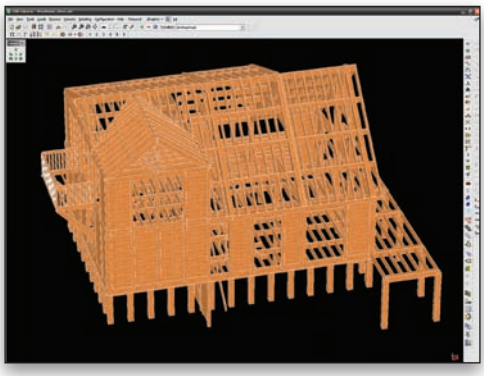
Design

- Hot rolled steel design per AISC 360-05 (13th edition) either in LRFD or ASD, as well as BS 5950-1:2000
- Cold formed steel design per AISI/COS/NASPEC 2001, including the 2001
- Reinforced concrete design per ACI 318-05, ACI 318-99, and BS 8110
- Wood design (sawn lumber, timber or glulam) per NDS 2005 in ASD or LRFD

Design/Detailing Modules

- » Reinforced concrete beam, column and footing design
- » Designs for flexure, shear, and torsion for beams
- » Designs for axial, biaxial bending, shear and slenderness effects for columns
- » Seismic provisions for column detailing
- » Calculation of lap length, development length, and cutoff points

- Retaining wall design
  - » Analysis and design of reinforced or unreinforced concrete or masonry retaining walls
  - » ACI 318-05, ACI 530-05 or BS 8110 codes
  - » Options to define cantilever, gravity or restrained retaining walls (with a lateral restraint and pinned or fixed bases)
  - » Tapered stems or stems with several blocks with thickness and reinforcement changes
  - » Axial loads on the stem are considered (with or without eccentricity)
- Continuous beam design
  - » Steel, wood, or concrete beams
  - » Automatic skip loading
- Tilt-up wall design
  - » Fixed, pinned or compression only springs for the bottom support of the wall
  - » Simplified or finite element analysis methods
  - » Automatic design according to the ACI 318 and ACI 551 codes
  - » Vertical concentrated and distributed in-plane loads: dead or live, with or without eccentricity Lateral distributed out-of-plane loads: wind or seismic
  - » Isolated or continuous footings option
- Masonry wall design
  - » Bearing walls, shear walls, columns and lintels
  - » Unreinforced or reinforced bearing and/or shear walls
  - » FEM analysis of the wall
  - » Automatic design according to ACI 530-05 ASD
- Reinforced concrete shear wall design
  - » Consideration of boundary elements as columns or flanges
  - » Analysis of the wall with FEM (finite elements method)
  - » Automatic design according to the ACI 318-05 Code
  - » Vertical concentrated loads with or without eccentricity
  - » Vertical distributed in-plane loads



RAM Elements includes wood design including sawn lumber, timber and glulams.

Holabird and Root, LLC used RAM Elements to design the Davenport Rhythm City Skybridge, Davenport, Iowa