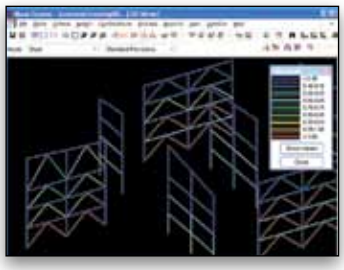
PRODUCT DATA SHEET

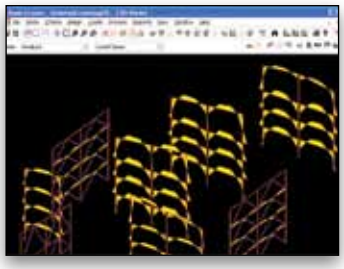
RAM FRAME®

RAM STRUCTURAL SYSTEM'S PRODUCTIVITY TOOL FOR LATERAL ANALYSIS AND DESIGN

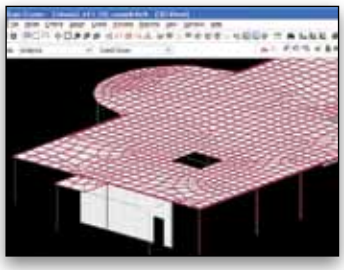
RAM Frame is a three-dimensional static and dynamic analysis and design program for designers, and structural and civil engineers. It automates the most time consuming tasks and is completely integrated to help the engineer deliver projects on time and within budget. It is specifically developed for lateral frame analysis and design of building systems subjected to lateral, dynamic and gravity loads.



Color coded interaction results



Member force diagrams for load cases or combinations



Automatic meshing of walls and semi-rigid diaphragms

Analysis for All Types of Building Structures Subjected to Static and Dynamic Loads

RAM Frame includes many time-saving features, unavailable in competing packages, in a highly sophisticated analysis package. RAM Frame accommodates a wide range of building structural configurations including moment frames, braced frames, shear walls, buildings with multiple diaphragms or a combination of these systems. Frames and walls can be of any building material including steel, concrete, masonry, or any combination of these materials. Gravity, wind, seismic, dynamic and notional load cases are automatically generated and applied to the model. In addition, detailed reports and CAD drawings are provided.

Fully Integrated with RAM Structural System

RAM Frame is fully integrated with other programs in the RAM™ Structural System such as RAM™ Concrete and RAM Foundation. Gravity loads created in the modeler are automatically calculated and distributed into RAM Frame. Loads and analysis results obtained from RAM Frame are automatically transferred into RAM Concrete to design concrete members and into RAM™ Foundation to design pilecaps, spread footings and continuous footings. Modeling data, analysis and design results between programs are automatically and continuously synchronized. RAM Frame is also integrated with RAM™ Concept to design reinforced and post-tensioned concrete floor systems and mats.

Comprehensive Design Modules

RAM Frame contains two fully integrated steel design modules. The Steel Standard Provision automatically designs all lateral members. The effects of gravity framing, including loads and unbraced segment lengths, are automatically considered and load combinations are automatically generated. Doubler plates and stiffener plates are also designed where required. The Steel Seismic Provision design is the most comprehensive in the industry, considering all major frame types. Several domestic and foreign design codes are supported, including AISC, UBC, Canadian, British and European Steel Design.

Two powerful post-processing modules are also integrated in RAM Frame, allowing the engineer to easily optimize drift in the structure and obtain wall force information for further design.

Automatic Drift Optimization and Shear-wall Design Force Calculations

Two powerful post-processing modules are also integrated in RAM Frame. This allows the engineer to easily optimize drift in the structure and obtain wall force information for further design. The Drift module graphically identifies those members with the most significant contribution to structure drift, allowing the engineer to easily optimize the member sizes to control drift. The Shear Wall Force post-processor provides design forces wherever the engineer needs, whether through piers, between wall openings or between levels.

Detailed Reporting Capability

RAM Frame allows the engineer to generate detailed reports in every step of analysis and design. Analysis results are reported for the structure as a whole and detailed reports for individual members are also provided. The program also generates drawings for the lateral frames. Many tools are available to interactively display analysis results graphically.

SYSTEM REQUIREMENTS

Processor:
Intel Pentium or AMD Athlon

Operating System:
Windows Vista, XP, and 2000

RAM:
128MB recommended

Hard Disk:
100MB free disk space recommended

Display:
OpenGL 3D graphics supported

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 FRAME AT-A-GLANCE

General Analysis and Design Features

- Static and dynamic analysis of buildings with moment frames, braced frames, shear walls and/or any combination of these systems
- Members with any material types, including steel, concrete or user defined materials
- Automated mesh generation for walls and diaphragms
- Analysis with tension-only members
- AISC 360 Direct Analysis Method option
- P-delta analysis option
- Foundation springs
- Rigid, semirigid and flexible diaphragms
- Analysis with multiple diaphragms per story
- Calculation of Redundancy factors and inclusion in Load Combinations where applicable
- Automatic generation of steel and concrete design Load Combinations per specified code
- Automatic calculation of K-factors (effective length factors) and unbraced lengths, with capability of user override

Static Load Generation Features

- Gravity loads distributed and applied to structural model in RAM Frame
- Automatic calculation of notional loads based on dead, live, roof and snow loads on diaphragms and on members, per AISC 360-05, BS 5950, CAN/CSA S16-01 or user-defined notional load cases
- Analysis of dead, live, roof, wind, seismic and user-defined load cases
- Live load reduction factors automatically calculated
- Automatic generation of wind story forces per IBC, ASCE 7, UBC, BOCA, SBC, BS 6399, NBC of Canada, China GB 50011 and Eurocode
- Automatic calculation of member self weights for beams, columns, walls, slabs and decks
- Automatic generation of seismic story forces per IBC, ASCE 7, UBC, BOCA, SBC, NBC of Canada, China GB 50011 and Eurocode

Dynamic Analysis Features

- Automatic calculation of structural mass properties (story mass, center of mass and mass moment of inertia)
- Optional inclusion of effects of +/-5% offset of center of mass to account for accidental torsion moments
- Response Spectra analysis per IBC, UBC and user-specified, with option for SRSS or CQC combination of modal results with signs, and option to consider eccentricity of story masses

Reports, Outputs, and other Graphical Tools

- Animated deflected shapes
- Calculation of story drifts at any point in the structure
- Automatically generates CAD DXF export of frame and wall elevations
- Analysis and Design results displayed graphically or in text format with ability to export
- Comprehensive material takeoff, including piece count and steel tonnage allowing for comparison of various design schemes

Steel Standard Design Features

- Member and joint design checks based on numerous design codes, including AISC ASD, AISC LRFD, BS5950, CAN/CSA-S16 and Eurocode
- Designs column web plates (doublers) and stiffeners (continuity plates) for wind and low seismic applications
- Automatically calculates effective length factors, flange bracing and unbraced lengths
- Full interactive control for review and design refinement

Steel Seismic Design Features

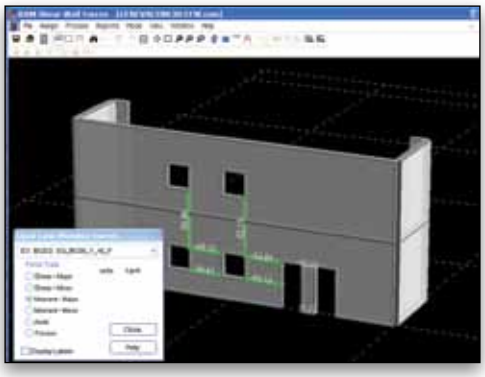
- Performs additional special seismic code design and detailing checks for members and joints, based on AISC 341-05 ASD and LRFD, AISC 1997 and 2002 LRFD, UBC 1997 LRFD and ASD, and FEMA 350
- Automatically generates seismic load combinations
- Supports all concentric braced frame, eccentric braced frame and moment frame structural systems
- Considers reduced beam sections (dogbone) where applicable in moment-frame joint checks
- Option to perform FEMA 350 moment-frame joint requirements for UBC seismic code
- Supports all seismic zones for each seismic code

Drift Control

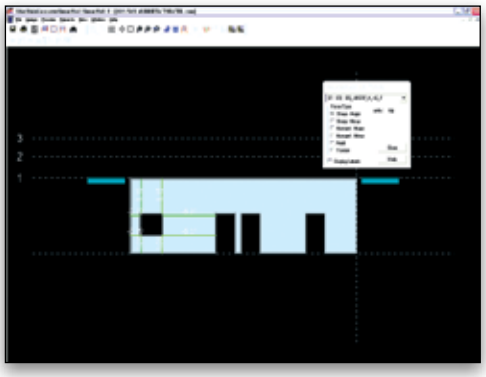
- Provides a functionality to study and control the drift behavior of buildings.

Shear Wall

- Provides detailed analysis results for shears, moments and axial forces in shear walls
- Allows the engineer to define vertical and horizontal section. Cuts through any cross-section on any wall
- Cross-section forces reported either per load case or per load combination



Shearwall forces displayed at any cross section



Shear wall Load Combination Forces

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