



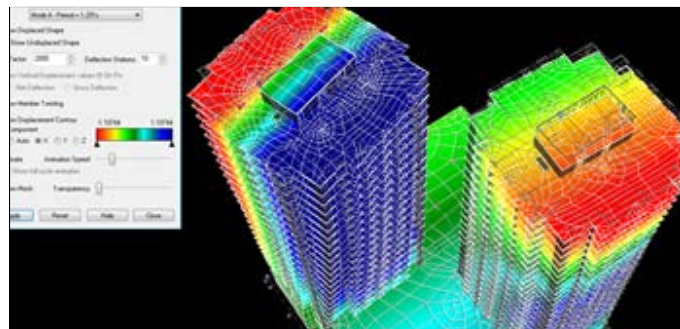
RAM[®] Structural System

Integrated Structural Analysis and Design
of Concrete and Steel Buildings

RAM Structural System is an integrated 3D static and dynamic structural analysis and design solution that automates time-consuming tasks. The application helps engineers deliver projects on time and within budget. It is developed for concrete and steel-framed building systems subjected to lateral, dynamic, and gravity loads.

PERFORM ANALYSIS FOR ALL TYPES OF BUILDING STRUCTURES SUBJECTED TO STATIC AND DYNAMIC LOADS

RAM Structural System is a highly sophisticated analysis package that includes many time-saving features, unavailable in competing software packages. RAM Structural System accommodates a wide range of building structural configurations including flat concrete slabs, slab and beam systems, composite steel-framed floors, shear walls, moment frames, braced frames, isolated footings, strip footings, mat foundations, or a combination of these systems. Frames and walls can be of any building material including steel, concrete, masonry, or any



Modal analysis of concrete high rise in RAM Structural System.

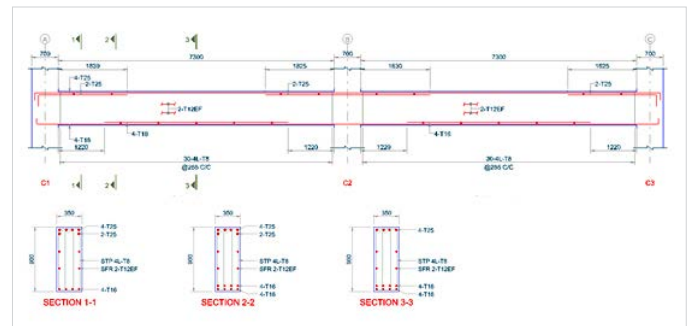
combination of these materials. Gravity, wind, seismic, dynamic, and notional load cases are automatically generated and applied to the model.

AUTOMATICALLY OPTIMIZE DRIFT AND SHEAR-WALL DESIGN FORCE CALCULATIONS

Two powerful post-processing modules are integrated into RAM. 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 needed, whether through piers, between wall openings, or between levels.

PRODUCE DETAILED REPORTS

RAM Structural System allows engineers 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. Many capabilities are available to interactively display analysis results graphically.



Concrete design and documentation in STAAD Advanced Concrete Design working directly off the RAM model.

SYSTEM REQUIREMENTS

MINIMUM: Windows 10 or above (64-bit), 1 GHz processor, 8 GB RAM

RECOMMENDED: Windows 11, 2 GHz multi-core processor, 32 GB RAM

RAM Structural System At-A-Glance

GENERAL ANALYSIS AND DESIGN

- 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
- Construction sequence analysis
- Concrete creep and shrinkage analysis
- Automatic generation of steel and concrete design load combinations per specified code
- Automatic calculation of K-factors (effective length factors) and unbraced lengths, with user override capability

STATIC LOAD GENERATION

- Gravity loads distributed and applied to structural model in RAM Frame®
- Live load reduction factors automatically calculated
- Automatic calculation of member self-weights for beams, columns, walls, slabs, and decks
- Automatic generation of wind story forces per IS875, IBC, ASCE 7, UBC, BOCA, SBC, BS 6399, NBC of Canada, AS/NZS 1170.2, China GB 50011, and Eurocode
- Automatic generation of seismic story forces per IS1893, IBC, ASCE 7, UBC, BOCA, SBC, NBC of Canada, AS/NZS 1170.2, China GB 50011, and Eurocode
- Automatic calculation of notional loads based on dead, live, roof, and snow loads on diaphragms and on members, per IS800, AISC 360, BS 5950, BS 8110, CAN/CSA S16, AS 4100, or user-defined notional load cases

DYNAMIC ANALYSIS

- Automatic calculation of structural mass properties (story mass, center of mass, and mass moment of inertia)
- Optional inclusion of effects of the offset of center of mass to account for accidental torsion moments
- Response Spectra analysis, 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 FEATURES

- 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

CONCRETE STANDARD DESIGN

- ACI 318, AS 3600, EN 1992-1-1, GB 50010, and IS 456
- Concrete beam column and moment frame design including rebar layout and schedules
- Automatic pattern loading
- Wall design

STEEL STANDARD DESIGN

- Member and joint design checks based on IS800, AISC 360 LRFD and ASD, AISC 9th ASD, AISC 3rd LRFD, BS 5950, CAN/CSA S16, AS 4100, 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

- Performs additional special seismic code design and detailing checks for members and joints, based on AISC 341 ASD and LRFD, AISC 358 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
- Analyzes and designs Star Seismic and CoreBrace Buckling Restrained Braces, SidePlate and DuraFuse Moment Frame connections, and Simpson Yield-Link®
- 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 design based on combined forces and code requirements

TILT-UP BUILDING DESIGN

- 2nd-order analysis for slenderness effect of thin walls
- Out-of-plane wind pressure
- Comprehensive modeling (including gaps and reveals), analysis, and design