



RAM™ CONCEPT

THE MOST PRODUCTIVE TOOL FOR REINFORCED AND POST-TENSIONED CONCRETE DESIGN

No matter how complicated, an entire elevated slab or mat foundation can be designed more efficiently using RAM Concept. It easily accounts for steps, slabs, mats, openings, complicated loadings, and other irregularities. Developed for reinforced or post-tensioned slabs and mats, RAM Concept will save you time and money in the design of concrete structures. RAM Concept links with RAM Structural System and STAAD.Pro®, which allows engineers to perform gravity and lateral analysis and design on multi-story 2-way slab (post-tensioned or mild reinforced) concrete buildings.

Increase Profitability with Accurate and Efficient Designs

Unlike strip programs, RAM Concept can easily update an entire design after a change is made. RAM Concept's advanced analysis fully considers irregular slab geometries so you can feel confident your design is safe and accurate. RAM Concept 3D analysis allows the slab to pick the most efficient natural load path which results in more efficient designs with less reinforcement. Design changes can be accommodated and the slab redesigned and checked in a matter of minutes, not hours or days.

Realistic Tendon Modeling

RAM Concept allows you to model tendons in their true positions. Banded, distributed, or arbitrary tendons with virtually any profile can be easily modeled. Tendons can be swept around openings and can terminate anywhere in the floor system. Tendon calculations (including friction calculations and elongations) accurately consider horizontal and vertical curves. RAM Concept tendon loading analyses consider full 3D hyperstatic (secondary) effects, including restraint from shearwalls and stiff columns.

Benefits: Accurately understand the effects of the tendons on the slab, predict tendon stresses and elongations. Save drafting time—export a tendon layout plan

Most Accurate Punching Shear Analysis and Design Anywhere

RAM Concept can check punching shear capacity for any irregular slab geometry. It automatically designs studded shear reinforcement (studrails) as required. Punching shear can be checked and reinforcement designed at columns below slabs and at transfer columns on floors and mats/rafts. These capabilities can save a day of design time on every slab.

Benefits: Eliminate time required to simplify real punching geometry into standard interior, edge, and corner conditions. Have confidence that your punching designs are accurate.

Create Professional Reports, Export CAD Drawings

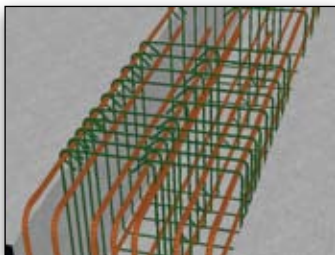
RAM Concept allows you to customize a professional report that covers the design of the entire slab system. Include any plan or perspective drawing that is viewed on-screen as well as information from text and table windows. Export any plan drawing to CAD.

Benefits: Avoid manual report compilation time—create submission-ready complete reports straight from the software. Save drafting time—export the final design as preliminary reinforcement CAD drawings

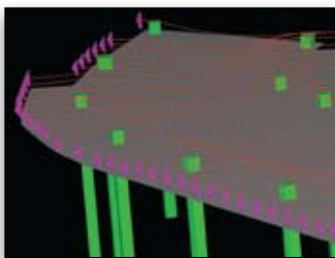
A RAM Concept user comments on how his firm increased their productivity tenfold with this integration.

"The project we were working on was a 32-story condominium with post-tensioned flat slabs in Miami, Florida, and with the improved link between RAM® Structural System and RAM Concept we were able to do in one day what previously took us ten days. Our firm has found many benefits to using RAM Structural System and RAM Concept together. For instance, with our multi-story concrete buildings we used to have to spend a lot of time transferring loads from different programs and tracking our loads—both gravity and lateral—all the way down to the foundations. Now RAM takes care of that for us."

*Alex Salmin, P.E., Chief Structural Engineer
Trillium Structures, Inc.*



RAM Concept provides realistic reinforcement layouts



Model tendons in virtually any position

SYSTEM REQUIREMENTS

Processor:

Multiple cores utilized but not required

Operating System:

Windows Vista, XP

RAM:

1GB recommended

Hard Disk:

100MB free disk space

Display:

256MB video card with DirectX 9 compatible (DirectX 10 compatible recommended)

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.

For more information, visit www.bentley.com or call 1-800-BENTLEY

BENTLEY OFFICES

Corporate Headquarters

685 Stockton Drive
Exton, PA 19341 USA
1-800-BENTLEY (1-800-236-8539)
Outside the US +1 610-458-5000

Bentley Systems Europe B.V.

Wegalaan 2
2132 JC Hoofddorp
Netherlands
+31 23 556 0560

Bentley Asia

No. 1 A Jianguomenwai Avenue
Chaoyang District, Unit 406
NCI Tower Beijing 100022
+86 108 518 5220



RAM CONCEPT AT-A-GLANCE

Flexible Structural Modeling

- Elevated floors and mat foundations
- One-way and two-way slabs, pan joists, waffles, beams, girders
- Orthotropic or isotropic slab properties
- Drop caps, drop panels and random thickenings of any shape at any location
- Openings of any shape at any location
- Wall, column, point spring and line spring supports
- Accurate modeling of irregular structures
- Zero-tension area (soil) springs
- Imported CAD drawing as snapping background
- Automated Meshing

Tendon Modeling

- Banded, distributed, and arbitrary tendons with virtually any profile
- Friction losses including consideration of horizontal curves
- Analysis includes 3D hyperstatic (secondary) effects

Loading Analysis

- F_x , F_y , and F_z point, line, and area force loads
- M_x and M_y point, line, and area moment loads
- Line loads (force and moment) can vary linearly from end to end
- Area loads (force and moment) can vary linearly in two directions
- Self-weight and tendon loadings calculated automatically
- Self-equilibrium loadings available

for integrating floor-system analysis with building frame analysis from any source

Pattern Loading

- Loads can be filtered through arbitrary-shaped patterns with on-pattern and off-pattern factors
- Pattern loading effects automatically enveloped together

Live Load Reduction

- ASCE 7-02, AS/NZS 1170.1:2002, BS 6399-1:1996, IBC 2003, IS 875-1987, UBC 1997, EC1-2002
- Tributary/influence areas may be specified or calculated by the program

Load Combinations

- Automatically generated load combinations for each design code
- Optional user-specified load combinations (no limit)
- Two load factors per loading, allowing easy enveloping of max and min forces
- Zero-tension area spring results for mat/raft foundations

Mild Reinforcing Modeling

- Modify designed reinforcing or define custom reinforcing
- Specify a uniform mesh of reinforcing over an area, with only additional required reinforcing designed
- Automatic calculation and consideration of development lengths

Span and Cross Section Design

- Automated layout of design spans
- Post-tensioned, reinforced, and

hybrid concrete design

- Considers minimum, strength, initial service (transfer of prestress), service, and ductility design
- Cracked section analysis using appropriate material stress-strain curves for each component
- Long-term deflections considering cracking, creep, and shrinkage
- ACI 318-99, ACI 318-02, AS 3600-2001, BS 8110-1997, IS 456-2000, ACI 318-05, EC2

Punching Shear Design

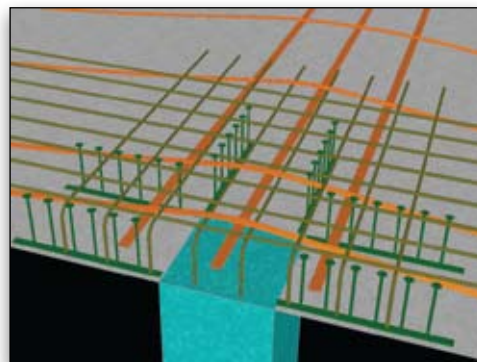
- Automated generation of critical section considering actual (not simplified) geometries
- Design for columns above or below the slab
- Considers biaxial moments
- Design of SSR (studded shear reinforcement)

Report Generation

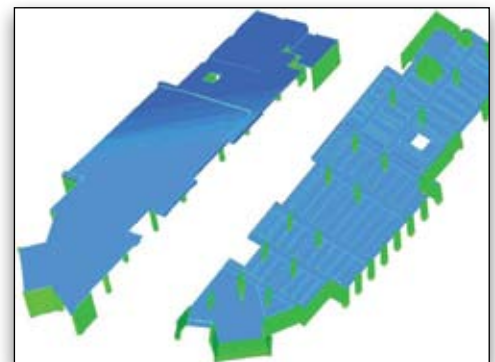
- Fully customizable professional reports
- Reports are complete ready-to-submit calculations
- Reports can be printed to any page size or orientation

Integration Features

- Import of structure and loadings from RAM Structural System
- Export of column and wall geometry to RAM Structural System
- Export of column reactions to RAM Structural System
- Import of structure and loadings from STAAD®
- Import and Export of CAD drawings



Flat slab column detail depicting reinforcing including studded shear reinforcement



RAM Concept allows for accurate modeling of irregular structures