RAM® SBeam

Productivity Application for the Design
of Composite and Noncomposite Steel Beams

RAM SBeam is powerful and versatile software for the design of individual steel beams. Optimize new designs or analyze existing designs of composite and noncomposite steel beams. RAM SBeam has a user interface known for simplicity and ease of use, while providing powerful comprehensive design capabilities.

COMPREHENSIVE STEEL DESIGN CAPABILITIES

RAM SBeam is used to design composite and noncomposite steel beams, as well as cellular and castellated beams. It can select optimum sizes and shear studs, or check the adequacy of existing members, based on a breadth of steel design codes. It rigorously accounts for the stud spacing, effective flange width, and shored or unshored conditions of composite steel beams, which results in significant time savings while delivering safe and economical designs. Design restrictions, such as depth restrictions and camber limits, and special design considerations, such as web openings, can also be included in the optimization or design investigation. Design simple span or beams with cantilevers on one or both ends.

DESIGN EXPERTISE

RAM SBeam is developed, tested, and supported by structural and professional engineers with extensive industry experience. That expertise in building codes, construction techniques, materials, and the design process is embodied in the program. Careful consideration has been given to your needs to design steel structures and to execute project design. In addition, an extensive set of design criteria is available that allows you to customize the designs in accordance with office standards and local practices.

ENHANCED PRODUCTIVITY

RAM SBeam increases engineering productivity by simplifying the steel beam design process. An interactive design interface gives engineers the ability to quickly evaluate optimized designs, quickly change design properties, and check final designs with those changes. Shear, moment, and deflection diagrams are displayed in a convenient graphical interface that gives the engineer the ability to evaluate results for any load condition at any point along the span. All design checks are summarized in a detailed but easy-to-read report.
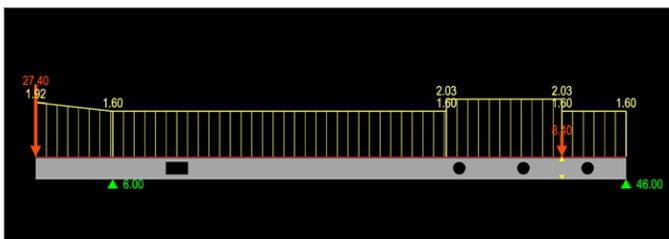
WEB OPENINGS

Web openings are often utilized to accommodate electrical and mechanical systems. RAM SBeam can design beams with round and rectangular openings, including any reinforcing and welds, if needed. Designs are performed per the requirements of AISC, Eurocode, and BS 5950.

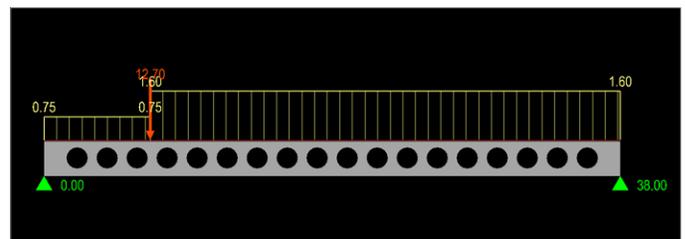## CASTELLATED AND CELLULAR BEAMS

Design of composite and noncomposite castellated and cellular beams, sometimes referred to as C-Beams, is performed per AISC Steel Design Guide 31, *Castellated and Cellular Beam Design*.

RAM SBEAM AND RAM STRUCTURAL SYSTEM

RAM SBeam was extracted from and contains a subset of the design capabilities of RAM Structural System. RAM Structural System is a structural analysis and design program for buildings and structures. RAM Structural System automatically computes tributary loads to all members; reduces the live load in accordance with applicable building codes; designs all beams, columns, walls and footings from the roof to the base; and performs wind and seismic analysis. It provides tremendous value to the engineer in increased productivity, automating and integrating the most tedious and time-consuming tasks.

Steel beams with web openings.

RAM SBeam is used to design composite and noncomposite steel beams and cellular and castellated beams.

RAM SBeam At-A-Glance

BEAM TYPES AND MODELING CAPABILITIES

- Composite and noncomposite steel beams
- Composite and noncomposite castellated and cellular beams (C-Beams) per AISC Steel Design Guide 31
- I-shapes, HSS, and channels
- Simple spans or extended cantilevers
- Top and bottom flange bracing conditions for the determination of unbraced length
- Database of common deck types for quick definition of composite properties

DESIGN CODES

- AISC LRFD 3rd Ed. and ASD 9th Ed., and AISC 360-05, 360-10, and 360-16
- CAN/CSA S16-01, S16-09, S16-14, and S16-19
- Eurocode EN 1993-1-1:2005 (steel) and EN 1994-1-1:2004 (composite)
- IS 800-07 (noncomposite only)
- BS5950:1990 and BS 5950:2000
- AS 4100-98

BEAM DESIGN FEATURES

- Get control over the final beam design with interactive design investigation
- Quickly optimize beam sizes and stud spacings or manually define properties and check designs
- Use comprehensive deflection checks, including automatic camber calculation and consideration of pre-composite and post-composite states
- Consider number of stud rows as limited by beam flange width, and spacing of studs as limited by the ribs of deck parallel, perpendicular or at an angle to the beam, in the determination of shear studs
- Utilize full or partial composite, with minimum percent composite specified by user
- Work with shored (propped) or unshored conditions
- Conduct pre-composite checks for unshored beams using construction dead and live loads
- Consider beam size restrictions, including max span/depth ratio, max/min depth, and min flange width
- Reduce demand/capacity limits for strength and deflection checks
- Consider the specified braced and unbraced compression flange conditions with member capacities

LOADING CAPABILITIES

- Dead, live, partition, and construction loads
- Uniform, partial uniform, trapezoidal, and concentrated loads
- Automatic calculation and inclusion of beam self-weight
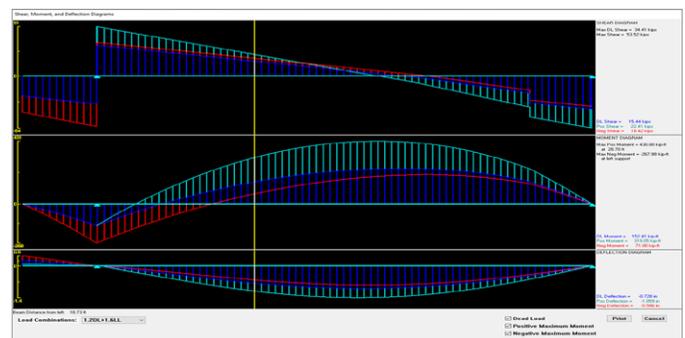- Automatic live load patterning on cantilevers

WEB OPENINGS

- Round and rectangular web openings
- AISC ASD and LRFD design per AISC Steel Design Guide 2, Steel and Composite Beams with Web Openings
- BS 5950 design per SCI Publication 068, Design of openings in the webs of composite beams
- Eurocode design per SCI Publication 355, Design of composite beams with large web openings, in accordance with Eurocode and the UK National Annexes

REPORTING FEATURES

- Interactive graphical display of shear, moment, and deflection diagrams with results available at any point along the span
- Load diagrams
- Detailed reports of design checks
- All reports can be viewed on screen, printed, or saved to spreadsheet file format

INTEROPERABILITY FEATURES

- Export beams from RAM Structural System, RAM Elements, or STAAD.Pro to RAM SBeam

Shear, moment, and deflection diagrams