

“RISA is our software of choice for projects with complicated geometries.

The simple interface and graphic display capabilities, in particular the ability to spin the model about any axis, are what make RISA most useful.”



Project

Art Museum of Western Virginia, Roanoke, Virginia

Challenges

- Coordinating the 3D construction documents made in Rhino with the geometry created in RISA-3D and RISAFloor
- Managing complex floor design and sophisticated roof geometry in a single model
- Highly irregular shape of the steel roof and exterior walls

Solutions

Derrick Roorda knew the challenge ahead when his firm, DeSimone Consulting Engineers, PLLC. of San Francisco, was commissioned to do a structural analysis and design of the Art Museum of Western Virginia.

The 75,000-sq.-ft., three-story building in Roanoke, Virginia, is designed by Randall Stout, a former designer for celebrated architect Frank O. Gehry.

Roorda worked previously on a Gehry project and was aware of the challenges

presented by the complicated geometries associated with similar structures.

The challenge was made easier by the only software Roorda uses on such multifaceted structures: RISA.

“For steel buildings with complicated 3D geometries, RISA is the only software to use,” Roorda proclaims.

The biggest challenge for Roorda, and the most time-consuming part of the

QUICK FACTS

Structural Engineer
DeSimone Consulting Engineers, PLLC.
San Francisco

Design Team
Derrick Roorda, S.E.
Lisa Minakami, P.E.

Size
75,000-sq.-feet

Completion Date
Late 2008

Cost
\$40 million

Software
RISA-3D
RISAFloor

“For steel buildings with complicated 3D geometries, RISA is the only software to use.”

Derrick Roorda, S.E., DeSimone Consulting Engineers

design and analysis process, was taking the architecture plans created in Rhino and converting them into files readable in RISAFloor and RISA-3D.

“We spend a lot of time on projects like these modeling the structure in Rhino,” Roorda explains. “You’re constantly thinking about member orientations and geometries. You have to make sure the pieces come together so they can be detailed.”

Because of the numerous loading conditions of the steel beams, columns and braces, Roorda choose to model the building in one model.

“This building was unusual,” Roorda says. “Because this thing has so many column transfers and cantilevers and multiple load path transitions running vertically down the building, it’s really

difficult to keep track of it one floor at a time.”

Roorda utilized the seamless integration between RISA-3D and RISAFloor for the first time on the Art Museum of Western Virginia.

The architectural design of the Art Museum of Western Virginia was inspired by the surrounding Blue Ridge Mountains, as well as the unique geological formations of the area.

Among the building’s notable features are undulating roofs and curving, angular exterior walls. The “metal skin” roof was the focal point of the design for Roorda.

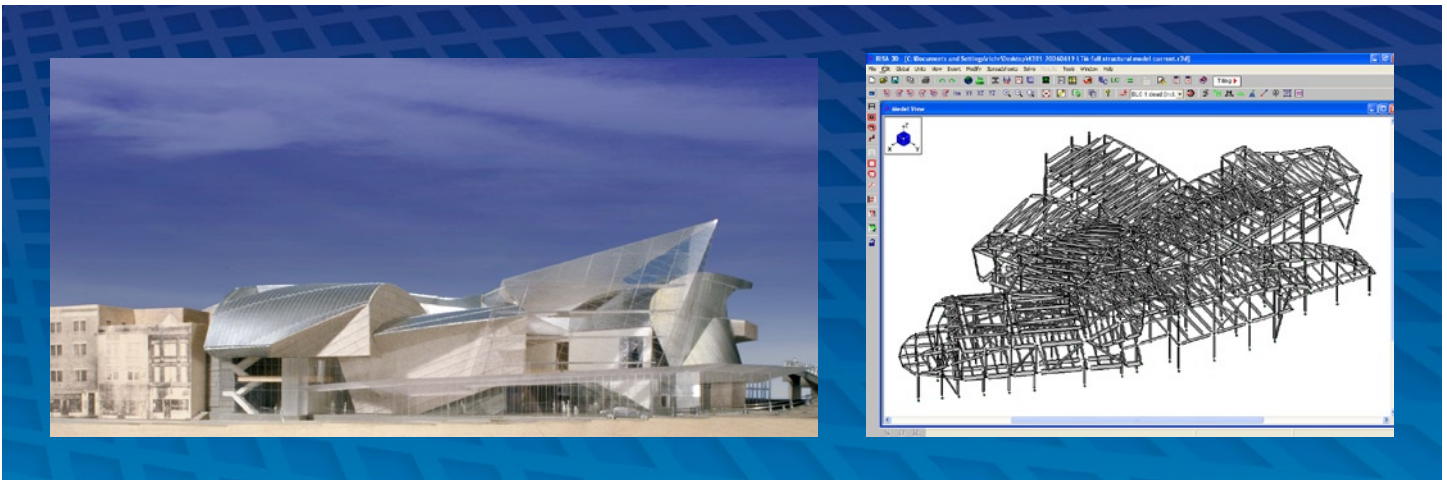
“The skin drives the roof framing,” Roorda says. “The hardest part (of the analysis) was finding column locations

that work with that geometry. You have to find straight lines in the geometry where you can put steel beams. Many times you want a column in a place where a column doesn’t want to be.”

The effortless interface of RISA-3D and RISAFloor, combined with powerful analysis and design features, enabled Roorda to make changes to his model quickly and easily.

“There’s a lot of software packages that will design steel beams and columns and perform analysis,” says Roorda, who has used RISA software primarily since 1995.

“With RISA, it’s the ease of use. The ability to be able to select and unselect members and focus on any part of the 3D model at one particular time is the reason why I choose RISA.”



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