

*“RISA allows us to rapidly study multiple solutions to a given problem so that we can determine the optimum structural system that meets the clients’ objectives. With the current fast-track nature of the business, the ability to arrive at the best solution quickly is a definite strategic advantage.”*



### Project

Splash Lagoon Indoor Waterpark Resort  
Erie, Pa.

### Challenges

- The waterpark facility is one of the largest in the U.S. with more than 400,000 gallons of water spread across seven slides, a lazy river and several large pools
- All interferences between the structure and various rides and support systems had to be fully coordinated
- Typical of amusement parks, the 77,000-square foot structure had to fit around the attractions. The numerous rides and pools intermingle in a column-free, clear span of 80x120

### Solutions

Among locals, there’s purported to be only two seasons in Erie—August and winter. The cool climate that makes it a perfect locale for an indoor waterpark added to the challenge of completing construction of such a project on time.

Dave Steele, owner and lead engineer of Steele Structural Engineering (Erie, Pa.), faced this dilemma with the Splash

Lagoon Indoor Waterpark Resort, the largest such facility on the East Coast. His solution to the fast-track nature of the business is to use the software that saves him the most time: RISA-3D.

Steele used RISA-3D to model the gravity and lateral systems of the 77,000-square-foot water park and design the footings.

### QUICK FACTS

#### Location

Erie, Pa.

#### Structural Engineer

Steele Structural Engineering,  
Erie, Pa.

#### Lead Engineer

Dave Steele

#### Construction Manager

Bob Banks Project  
Management, Inc.

#### Size

77,000 sq. ft.

#### Cost

\$18,000,000

#### Software

RISA-3D

***“Physical Members and surface area loads dramatically improved the speed in which with we could model and look at the deflections. It was the difference between inputting the loads in an hour as opposed to a couple of days.”***

***Dave Steele, Steele Structural Engineering***

The feature that saved Steele the most time was RISA-3D’s Physical Members. A feature unique to RISA-3D, Physical Members provides fixity to all joints that occur along the length of the member, without breaking that member up into multiple smaller members.

Physical Members allow you to avoid having to define one field member with multiple members in your model. This saves time in building and editing your model and understanding your results.

The waterpark was the first project Steele utilized the Physical Members feature and he was impressed with the results.

“Physical Members and surface area loads dramatically improved the speed

in which with we could model and look at the deflections,” Steele says. “It was the difference between inputting the loads in an hour as opposed to a couple of days.”

To create the large clear span for the attractions, glulam timber columns were used to support the rugged, exposed framing system designed for the Splash Lagoon’s roof.

The 77,000-square-foot structure required only 10 interior columns because of the long-span capability of the 84-foot glulam girder beams.

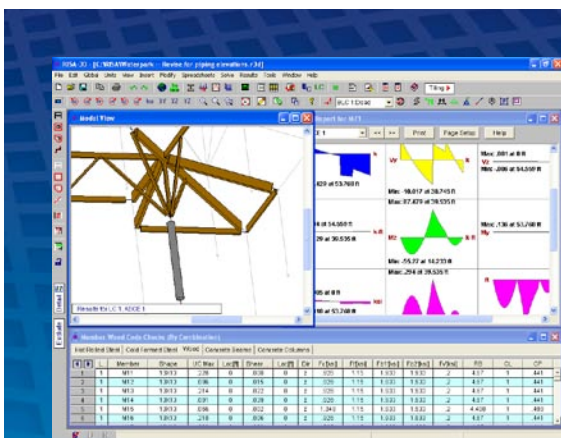
Steele says the unique tree-shaped columns made it possible to specify narrower size girders and trusses. The “Christmas tree” laminated timber columns and knee braces are 12 x 12

inches and connected to curved and tapered beams, rafters and purlins. The largest beam was 48 inches deep.

“There was a fairly large clear span required,” Steele says. “To say you’re going to be able to frame something in wood with that large of a column-free area is usual.”

It was such a complex structure that without RISA-3D’s Physical Member features Steele faced having to keep track of four to five times as many members.

“This is probably the most complex project we’ve done,” Steele explains. “There’s no way we would have done this type of structure by hand; it’s not in the realm of possibility.”



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