

# MODULAR CONSTRUCTION PROVES EFFECTIVE FOR NAVAL REACTOR FACILITY

permanent foundation system, and the design of important site features such as the elevator shaft and pit, walkways and canopies. In addition, they

## A MODULAR PROJECT

Modular buildings are far from one size fits all. Each site and client requires the application of a unique design solution. It takes a design team with modular engineering experience and a deep understanding of the modular building industry to address all of the needs specific to a project, including the design, foundation, and state-specific structural requirements. A modular project needs a modular engineer.

## THE NAVAL REACTOR FACILITY

The facility, a government installation, wasn't your everyday design-build. The project—a two-story modular building slated for construction on the grounds of a nuclear reactor facility—presented challenges up and down the line. It took a unique blend of industry experience, out-of-the-box thinking, and the ability to respond to changing needs quickly and efficiently to pull it off on time.



Putting together a team for this project was the first task. Satellite Shelters, Inc. had received the contract to build a two-story commercial modular structure on a government-owned site in the Western states. The client wanted the building up fast, so Satellite brought Modtech on board, a well-known modular manufacturer. Modtech in turn hired Ralph Tavares of R&S Tavares as the structural engineer to ensure that the project was exactly as it should be.

R&S has the expertise to design for the complex needs of modular buildings. They provided the structural engineering and design of the two-story modular building, the specifications for the

designed the braced frames and open web trusses on both floors, and saw the project through construction on time and on budget.

"I've worked with Ralph since about 2000," says Rick Bartolotti, former Vice President of Modtech. "He's well known as somebody who understands modular—there aren't many engineers who do." This project was more complex than usual, and the design had to be "perfect" from an engineering standpoint to satisfy the client.

Experience was key to the success of this project. Two-story modular buildings for commercial use are not the norm. "Schools, apartments and hotels are more typical" of the kinds of modular projects that usually get built, says Bartolotti. With the Army Corps of Engineers (A.C.E.) reviewing every step of the process with their "very stringent specifications," the project had to be engineered correctly.

"The A.C.E. were pretty tough customers," Bartolotti admits, "so we really had to cross all our Ts and dot all our Is." Clients sometimes overreact to modular design procedures because they don't fully understand how modular works. Part of R&S Tavares' job was to reassure the client that the modular design-build process was not in any way inferior to a site build. It is, in fact, faster, more efficient, and less expensive assuming you have an experienced team behind you.

R&S Tavares came up with the structural plan and had it approved immediately, but when a subcontractor installed the building without performing the welding correctly, R&S was able to come up with a quick and efficient fix on the fly. When the second story over the entrance was changed mid-project to be site-built instead of part of the factory-built modular design, R&S was able to coordinate with everyone on site to integrate (continued on reverse)

the new entrance into the overall design. "Problems happen, and Ralph's a problem solver," Bartolotti says. "He gets things done right."

## WORKING WITH R&S

Though the two R&S offices are in California, they provide professional services to modular building manufacturers, modular building dealers and architectural firms in the United States and Canada with licenses in 41 U.S. states. That kind of scope can make a huge difference when deciding which company to employ. "R&S has the capability to execute multi-state projects," says Randy Rebers, Vice President of Sales at Satellite Shelters, Inc. "Many engineers can only stamp in their own states. Their ability to stamp the designs for the vast majority of states is very valuable to us because we work in many different regions."

R&S has specific and extensive experience in structural and building design for commercial and residential modular structures in all fifty states. New York state and the Gulf states have high wind design requirements and specific lateral force design challenges, thanks to the hurricane-force winds likely to hit those shores. The approvals in those states can be tough to achieve, but R&S has an excellent record with the design approval process in that area. California, with West Coast seismic issues, can be a difficult state to design in, but R&S has a good track record there as well. The success of the Idaho project led Modtech to hire R&S to design a standard structural package for two-story commercial buildings for use in California, Arizona, and Florida.

With so many years experience in the modular industry, it would be easy for R&S Tavares's engineers and staff members to sit back and rest on their combined sixty years staff experience in modular design, but the changing nature of the business keeps the firm learning and growing. They understand the customer's needs and know how to focus on the goal of creating a structure that works well within the client's specifications. "We're designing boxes," Tavares jokes, "but we always think outside of the box."

"The Idaho project was our first job with R&S," says Rebers at Satellite. "We found them more than willing to work with the specific needs of our client,

and very available to answer questions we had about the implementation of the design."

"Ralph understands the overall process, from beginning to end," says Bartolotti at Modtech. "Where other engineers get focused on the minutiae, he takes a broader view." Where others might tend to over-engineer a project, R&S has the experience to grasp the complexity while at the same time hold back a little and let the simplicity of the design come through.



"Not a lot of engineering companies are willing to work with modular," says Tavares. His company works with the knowledge that a complete understanding of modular design and construction can save the client time and money. "We look at modular as a challenge," he says. "Whether a project is big or small, we look at the whole building and make it all work together."

"Any time I have any kind of engineering problems, he's the one I go to," Bartolotti says. "He's always willing to help me out, even if my question relates to a project on which he is not the engineer. I really appreciate that kind of availability."

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