

Ironworkers helped build iconic library dome

The new San Diego Central Library dome lights up the San Diego skyline like a jewel in the night. It wouldn't be the perfect piece of art, though, without the innovation and skills of 30 ironworkers from San Diego Local 229 and Las Vegas Local 433.

When construction began, SME Steel Contractors Superintendent Brandon Ott remembers all the materials didn't fit seamlessly – which isn't necessarily unusual on jobsites. Ironworkers on the job faced a challenge: They needed one of the library dome's distinguishing “sails,” with an incorrectly sized radius, to fit. However, when it connected at the top and bottom, it had a big belly in the middle of it.

“This project was as no other building...it took knowledge, trust and an open mind to ensure proper erection of the intricate structure,” recalls Ott.



The San Diego Central Library dome on Park Boulevard from a distance. Photo by Steve Simpson / Steve Simpson, Inc.



Ironworkers installed all the sails and ribs on the dome. Photo by ironworkers

The ironworkers needed to get the dome's sail fixed and fast. The eight rolled-steel sails, consisting of pipe, cables and rods, hold the structural integrity of the dome. The challenge was a big deal.

Thankfully, Ott says, they had a well-rounded group of ironworkers that could not only rig and weld, but also knew every aspect of the trade.

“We came up with an idea to heat the sail with big heavy rose buds (tools) in a pattern to where it would cool and draw itself into position,” says Ott.

This worked.

Ott emphasizes this project could not have been done without the expertise of union ironworkers, who spend hundreds of hours training unexpected jobsite situations.

For example, because it wasn't just structural welding they were doing, every welder working on the dome had to have a 6G welding certification, Ott says.

"It was not the average structural welding job," says Ott. "It was all out-of-position welding in very hard positions due to lack of access."

Without the 6G welding certification they could not weld on the dome. Skills differentiate these guys from the rest of the labor field.



Dome sail as it is being put in place. Photo by San Diego Public Library

San Diego Central Library Public Information Officer Marion Hubbard adds that the ironworkers' expertise certainly made the difference in getting the job done right.

"We are very pleased to have had so many professionals that contributed on both a large and small scale to this project."



San Diego Central Library dome shines in the sunlight. Photo by Steve Simpson / Steve Simpson, Inc.

Ott says that while they implemented and followed through with their safety program, they were not afraid to try different things.

"To be able to erect the dome, it was very important to have ironworkers with open minds," he says. "The training, past experience and sometimes just plain strength got this project done safely."

The dome structure rises 221 feet above the ground – that's about 20 stories up - to provide shade and accommodate the reading room. It's 143 feet in diameter, which is larger than the U.S. Capitol, and made up of eight steel ribs and eight rolled-steel sails that are tied together by cable and pipe. Each sail weighs 17 tons.

"We worked hand in hand with the engineers and the architect to make sure all the pieces of the puzzle fit together right," says Ott.

All of the dome's pipe pieces, also called members, were made in shops in Salt Lake City and in Phoenix and then shipped to the site.

Ott recalls that one of the biggest challenges was putting the pipe, known as ribs, and the sails of the dome in section.

“When we picked up the sails, they were picked up flat and then they were turned in the air and put in vertical position, then all the load went to the biggest crane we could fit on the job site,” Ott recalls. The larger of the cranes was a 1300 Libbehrr, assisted by a 300 Hydro to tip the sails in the vertical position.

“The biggest challenge was rigging and setting the large pieces after we had completed them on the temporary platforms,” he remembers, “We made changes to the pre-rigging plan and devised our own quicker and easier way to make our job easier.”

Meanwhile, the reinforcing contractor Gerdau Reinforcing Steel performed the installation of the reinforcing steel. Approximately 6,129 tons of rebar were installed by 15 men in about 40,000 hours. That's nearly 12.3 million pounds, which breaks down to 817,200 pounds per man that were installed, said Johnny Galvan Business Manager for Ironworkers Local 229.

“Our men do an amazing job. They are quicker, efficient but also precise. That's important to our signatory contractors – really any contractor wants that and we do it best. This was a lot of work,” says Galvan.

In addition to working on the stairs, rails and all the pop-out canopies on the Central Library building, the ironworkers installed, welded and fit every piece of iron on the dome.

And even though the library was 30 years in the making, Hubbard says the project was finished on budget and in the planned three-year time span.

“With a project of this magnitude there will always be a lot of challenges, but with a lot of good project management, it was very possible to keep the job focused and on track,” says Hubbard.



Part of a dome sail before being put in place.
Photo by Steve Simpson / Steve Simpson, Inc.

Galvan of Ironworkers Local 229 says this was one of the most challenging projects they've been a part of because of the intricacies of the dome, as well as the challenge of addressing issues that came up during construction.

“Thanks to our highly skilled and productive workforce, we were not only able to complete our part on time but also be part of creating something that will stand the test of time,” says Galvan.

The doors to the nine-story library opened in September 2013, giving the San Diego community access to a three-story domed reading room with incredible views of the San Diego Bay with the Coronado Bay Bridge.

“For me as an ironworker, one of the most rewarding parts of the project was being able to work with the high caliber of ironworkers that comprise Local 229 and Local 433,” says Ott.

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Library patrons can enjoy the Qualcomm Dome Terrace and rare books area with views of the San Diego bay in the background. Photo by Natalia Robert / Full Circle Images