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CASE STUDY

GREAT PARK ICE AND FIVEPOINT ARENA

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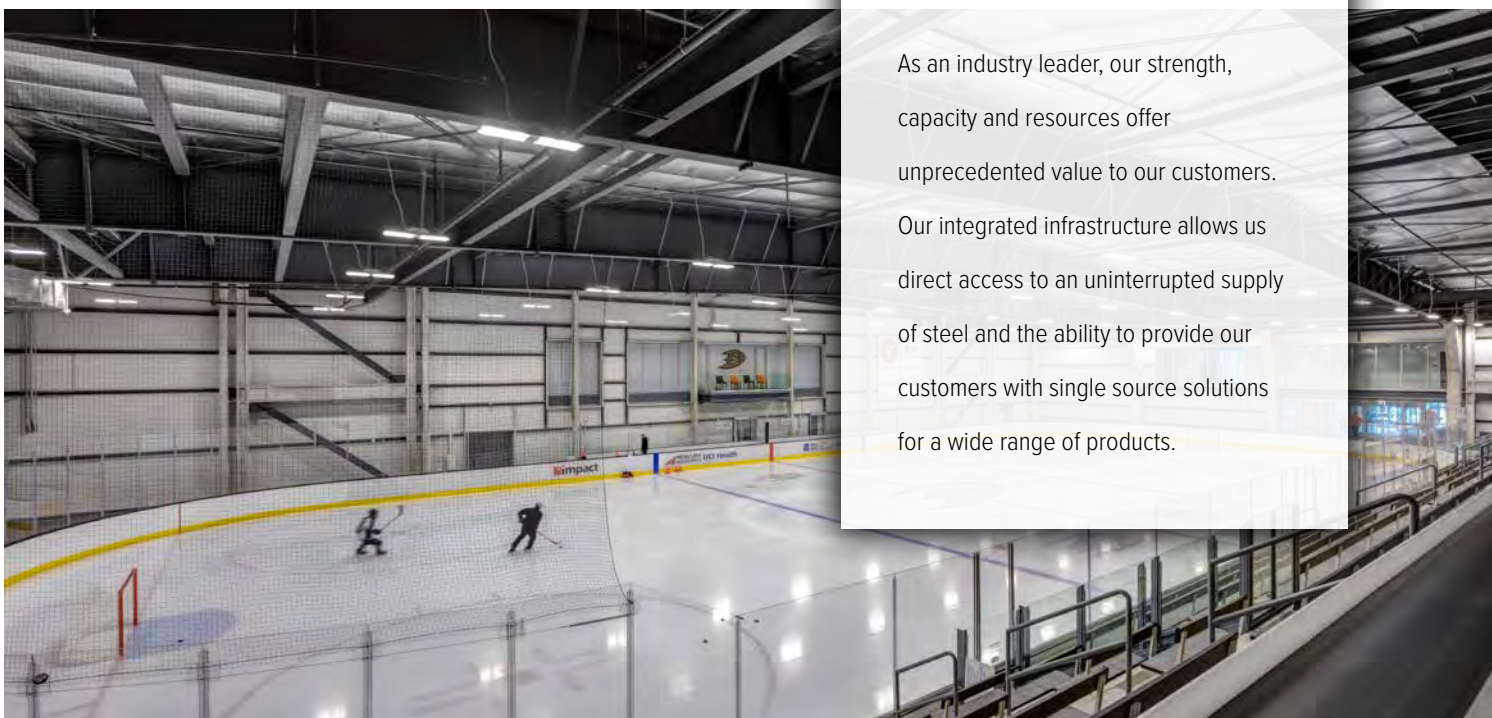
As a leader in innovation, Nucor Building Systems works continuously to develop products that are some of the most versatile, energy-efficient and cost-effective building solutions on the market today. We work closely with our customers to gain a deeper understanding of their needs then develop new solutions or improve existing ones that provide them with high-performance, competitive products. From our proprietary design products, such as TrussFrame, to our insulated metal panels with cool coating technology, our products allow our customers to increase efficiency and qualify for LEED® points.



As an industry leader, our strength, capacity and resources offer unprecedented value to our customers. Our integrated infrastructure allows us direct access to an uninterrupted supply of steel and the ability to provide our customers with single source solutions for a wide range of products.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FIVEPOINT
ARENA
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ARENA

With a total project area encompassing approximately 1,300 acres, Orange County Great Park, in Irvine, CA is transforming a former Marine Corps Air Station into a family friendly recreation area where visitors can spend the day, having fun in a variety of activities. The park has developed more than 200 acres and currently has just under 700 fully funded acres in the planning and design phases. The Great Park embraces recreation, competitive sports, parkland, and the environment.

One of the newest and most impressive facilities on the campus is Southern California's largest ice facility, Great Park Ice & FivePoint Arena. The over 212,000 square foot facility, completed in late summer of 2019, features three indoor NHL-regulation ice rinks and one Olympic regulation rink. The rinks serve as the training facility for the professional NHL team, the Anaheim Ducks®, and offer public skating, skate lessons, curling, youth and adult hockey. Additionally, there is an in-house pro shop, indoor gym, restaurant, and bar and café within the facility.

Construction of this massive facility was complex, yet a complete success. The project, built by Authorized Nucor Builder, Pre-Fab Builders, Inc., consists of two Nucor pre-engineered metal buildings, and a connecting building. One of the buildings, housing the Olympic-size rink and two NHL rinks, is a 221' x 423' x 35' clear span structure. Deciding how to span the three ice rinks brought design challenges that were successfully overcome by turning the building perpendicularly from the original designs. "The original conceptual design for the three rinks building was three gabled buildings side by side with the ridges center over each rink," explained Joe Mellody, senior district sales manager for Nucor Building Systems. "This placed interior columns and bracing in their locker room and second floor space. We rotated the ridge and made it one large clear span building eliminating the columns."

In addition, spanning the long distance of the rinks, rather than the short distance assisted in the functionality of the roof as well. "This allowed us to have better design in order to shed water off the roof correctly and not have leaks in the valley gutters," explained Jerry Hancock, vice president of Pre-Fab Builders.

The other, an arena with an NHL rink and 2,500 seat capacity, is also a clear span building measuring 168' x 282' x 38'. Coordination was key to the entire construction process, which involved coordinating the loads and tying in the various steel throughout the facility. "Integrating the structural steel into the pre-engineered steel, as well as coming through the steel for the concrete bleachers in the rink arena was a lot of tie in that needed to be coordinated. Everything came out really well." said Hancock.

Due to housing four ice rinks and keeping the building at a constant 55 degrees in Southern California, the facility was designed similar to a cold storage facility — functional, however still beautiful. "Building an ice rink comes with the unique challenge of properly insulating the structure to prevent vapor transfer and condensation," explained Gary Robinson, national accounts manager for All Weather Insulated Panels. "The team behind Great Park knew they needed a construction solution that would perform long-term and maintain the building's critical thermal requirements for years to come."

Utilizing Nucor ST40 and DM40 Insulated Metal Wall Panels to keep the interior temperature at that constant temperature was vital. Furthermore, the installation of the insulated metal panels was a comprehensive process as every nook and cranny had to be filled with foam insulation. Maximizing the length of the panels and setting them into place with cranes was also key. All these aspects of design allowed for the construction of a thermal envelope for the rinks.

The bay lift method was utilized for construction of the primary framing, secondary framing and bracing. Once the building columns and girts completed the frame of the building, the roof system, Nucor SR2 Insulated Metal Roof Panels, was created by building 111' x 30' sections on the ground. "All purlins and rods were built in place on the ground," said Hancock. "Two 35-ton cranes on each side then lifted each section over the building into the air and dropped down onto the columns. Months of prepping these sections on the ground, allowed for placement onto the columns and marrying them in the middle to put the roof together in a shorter period of time."

With Southern California placed in a high seismic geographic region and a building roughly 30' tall, standard bracing would not have supported this project. A steel buckling restrained brace system was utilized for this large of a facility. The braces are steel tubes that have a bar inside encased in concrete that create the brace. "It is very heavy and stout, a way better bracing system for large steel buildings due to seismic requirements," Hancock explained. "That bracing system can minimize or reduce the foundation design by a third and give a lot of advantage. It's more effort to put in, but once in place it's a solid platform."

Choosing a pre-engineered metal building was the ideal solution for the project, which came down to two straightforward reasons — span and cost. "Pre-engineered metal buildings are real cost effective, especially for big span buildings," said Hancock. "I like to say, 'we take a structural steel design and take the fat out'."

Pre-engineered metal buildings are ideal for all types of buildings, especially for sports and recreation areas. "Great Park is truly one of the finest sports complexes in the country, and it showcases the versatility and freedom of design one has with a modern metal building," Robinson said.

As a long-time Authorized Builder, Hancock praised how the partnership with Nucor supported the success of the Great Park Ice, "In this project, and every project, Nucor is such a partner. They make my job easier. They are supportive on every level, from pricing to design."

Building powerful partnerships was evident in gaining powerful results for this technically impressive and aesthetically beautiful facility. "I believe that one of the biggest factors in the success of this project was the amount of work done on the front end by the teams at Nucor Building Systems and Pre-Fab Builders, Inc.," said Robinson. "They worked hand-in-hand to ensure that the building was designed from the ground up to perform as intended and look good doing it. The end results speak for themselves — the Irvine community loves the facility, and everyone involved should be tremendously proud of the work they put into it."

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Nucor Building Systems has been a leader in the design and manufacture of custom-engineered metal building systems for over three decades. With four locations and a network of over 1,200 Authorized Builders serving all of North America, our focus is on customer service, price, and quality. We are also dedicated to providing sophisticated building solutions for our customers that are energy efficient and environmentally friendly.

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