

## **South Suburban Sports Complex**

Adolfson & Peterson Construction

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12. Best Building Project – General Contractor (\$40-\$70 Million)

### **Overview:**

For nearly 40 years, the South Suburban Park and Recreation District (SSPRD) has successfully provided recreational opportunities for approximately 160,000 residents in six cities and towns throughout Arapahoe, Douglas and Jefferson counties.

In 2017, SSPRD took on a ballot initiative to allow the District to increase its debt to repair and improve many indoor/outdoor recreation amenities and construct a new multi-generational facility. Recognizing the importance of community investment, the public passed the measure and the District worked to develop their newest facility in nearly 20 years – the South Suburban Sports Complex.

The 206,000-sf facility is an indoor sports and recreation venue, serving a wide range of community programs and interests. The complex is one of the few facilities in the region to include three sheets of ice – a main sheet with seating for 800, a second sheet with seating for 250 and a third sheet with minimal seating for practices and free-skating – allowing the District to expand its program offerings to residents and opportunities to host a variety of tournaments/events.

The facility also features two indoor turf fields, a sports performance training room, a gymnasium with two full-size courts, locker rooms, skate rental shop, proshop and snackbar. Visitors have access to a full-service bar/restaurant that overlooks the ice and a variety of multi-use meeting/party rooms. Additionally, the complex provided new District administrative offices.

As one of the largest indoor recreation venues in the region, the complex will continue to serve as a premier sports destination facility well into the future.

### **Solutions of Special Projects:**

The site posed challenges before construction could begin. With a 70-foot site elevation difference, extensive grading was required including moving over 80,000 cubic yards of dirt. Once building construction began, the site also proved to be a challenge to pour concrete for the third ice rink, which was situated towards the lower elevation of the site. A concrete pumping system was developed to bridge the distance between the truck and the ice sheet.

1,100 tons of steel was used to construct the fully pre-engineered facility. The entire structure for the roof was built on the ground, then hoisted with two cranes, followed by teams in boom lifts to secure them into place. The team faced structure-erection challenges when the PEMB structure was not designed to support the weight of essential support systems (such as the 160,000 pounds of ductwork required to circulate air amongst the large spaces). The team spent numerous hours calculating steel strength and loads, ultimately collaborating on a solution that added additional steel to the girders and beams to account for the weight of the duct.

Early in the project, the team faced a six-week delay for utility and site permits due to the COVID-19 pandemic. They reevaluated the schedule and sequencing to mitigate potential delays and worked with subcontractors to expedite materials and labor whenever possible; efforts resulting in a turnover within one week of the original planned finish date.

### **Excellence in Project Execution and Management/Team Approach:**

To ease vehicular access to the parking areas, the project required adding a street stoplight to the north of the facility, requiring different approvals from many entities including CDOT, Douglas County, Arapahoe County and the City of Centennial. The team proactively coordinated amongst all the jurisdictions to ensure the stoplight was added in time.

A bridge was also added onsite and required the coordination of three cranes for assembly/installation. The bridge was transitioned from one 500-ton unit to the next 500-ton unit with a 90-ton crane to transfer the bridge and slide it into place. Because this was considered a critical pick, extensive planning was required. Extra precautionary items and safety measures (weather, wind load, etc.) were implemented.

The facility also included a variety of high-end finishes and design features, requiring a high level of quality and craftsmanship from the floors to the ceiling. Over 100 miles of cabling was used just for the electrical system, including ten miles of cable for the fire alarm system and six miles of cabling dedicated to manipulating interior and exterior lighting features. In the main entry lobby, multiple moving lights were installed to illuminate the large public art mural, giving the imitation of grass moving through the breeze. For the ice sheets, special lighting features were installed to provide “clear” light for the users and spectators. A disco ball and figure skating performance lights were also installed so that the facility can host many types of tournaments and special events. At full force the facility needs 5,500 amps of electricity, which is enough to power 450 homes.

### **Construction Innovations/State-of-the-Art Advancement:**

As the project was under construction partially during the COVID-19 pandemic, the project team worked with the District to rough-in additional AV/ IT components at segmented increments to allow for socially distanced meetings. Using drone technology, AP also created a point cloud of the site. With this data, the team developed and validated site cut and fill quantities while providing the design team and their consultants a live environment to build and manipulate their models.

For the HVAC system, over five miles of ductwork was installed to recirculate the air between the ice, turf and gymnasium areas as well as the offices and support spaces. The three ice sheets alone required 33 miles of HDPE piping and their refrigeration power is the equivalent to the power of 213 home air-conditioning units or 340 home freezers. Multiple team members attended fusion welding classes for the HDPE piping (specific to ice rink construction) to be able to be certified to inspect every weld in each ice rink’s pipes. The pipe welds were certified by AP and a third party to make sure everything was up to the right standard, ensuring quality and longevity for each sheet.

To ensure that all three ice sheets were supported by an energy-efficient, durable and serviceable ice plant, the project team partnered with Ultimate Fabrication (UF). UF worked with the team to develop a 3D model of the ice plant. Thinking beyond installation, UF walked a 6-foot-tall computer-generated model through the 3D ice plant, looking at each component, making sure that the person was not constricted in movement and that they were able to assemble and disassemble components in place. The goal was to ensure all clearances were met so that if someone needed to perform maintenance on any component, they were able to work efficiently and safely.

### **Environmental/Safety:**

Safety was critical to the project's success and there were no safety incidents throughout construction. The team held daily hazard analysis, weekly toolbox, monthly site safety meetings and required an extensive jobsite safety orientation with each subcontractor before their work began.

With the onset COVID-19, the project team had to be nimble and adapt their safety protocols throughout the remainder of construction. AP implemented the highest levels of safety and precaution in line with all federal, state and local requirements.

The project site required stormwater and best management practice protection due to the overall extreme grade and a creek that wrapped the lower half of the site perimeter. Over the course of the project, 22 retaining walls were added to support the large building, surrounding parking areas and landscaping. Each retaining wall needed to be permitted individually with the county. A dry creek bed was also added onsite to ensure that stormwater appropriately flows away from the building's foundation.

### **Contribution to the Community:**

As one of the region's largest indoor recreation venues, the complex enabled the District to expand programming for ice sports and drop-in activities such as basketball, pickleball, soccer and lacrosse. Having three sheets of ice is an anomaly in the region and the configuration of the rinks allows for the ability to host national tournaments/events and provide ice access to more residents.

The third ice sheet was laid over concrete to allow for extra versatility of removing the ice and using the pad underneath for additional programming. Adjacent spectator areas also provide far greater access for people with disabilities than SSPRD's past ice arena, ensuring equitable access for all patrons.

SSPRD expects more than 300,000 participants and spectators will visit the facility annually. As the new SSPRD flagship, the South Suburban Sports Complex will continue to provide state-of-the-art recreation programs to District residents and visitors for many generations to come.

**Excellence in Client Service:**

“This project would not have been as successful without AP’s exemplary work. They provided a high level of transparency in their process and bidding information, which helped gain our team’s trust. They listened to input from our team and worked to customize their deliverables accordingly, which was very helpful for this highly visible community project. Throughout every phase of the project, AP provided the leadership and teamwork necessary to support the design and construction of a facility that has exceeded our expectations.”

- Melissa Reese-Thacker, Planning Manager, SSPRD









