SKYLINE
ENGINEERING LLC

Rushmore Plaza Civic Center Event Center

This new 133,000 SF spectator event center addition features a permanent ice floor for professional hockey and is adaptable with temporary flooring to accommodate concerts, trade shows, and other similar events. Skyboxes and permanent seating provides 5,127 seats for professional hockey, which can be augmented with temporary seating to provide 7,450 seats for concert events.

The project mechanical design coupled the ice chiller equipment with a thermal storage system to allow ice production to serve the space cooling needs. The electrical design features a computer controlled sports lighting package with full blackout capability.

Project Data

Owner
City of Rapid City, Civic Center

Location
Rapid City, SD

Building Type
Civic/Recreation

Building Area
113,000 square feet

Mechanical Systems / Features
160 Ton Chiller Plant
2400 Ton-hour Thermal Storage
Independent Suite HVAC
Custom Air Handling Equipment
Condensing Boilers

Electrical Systems / Features
Computer-controlled Sports Lighting
Dual Service Entrances – 208v & 480v
In-house ClearComm
Fire Alarm/Voice Evacuation
Hearing Assist
Suite Access Control
Lynx Broadband A/V Distribution
Data/Communications Cabling

Construction Cost
$23,700,000

Completion Date
2008

Mechanical Engineering

A 120,000 CFM ventilation system provides cooling, heating and ventilation for seating areas. Custom rooftop equipment serves an overhead air distribution loop with plenum fans equipped with variable speed drives for minimal sound transmission. Supply air can be directed to different portions of the facility as needed to match changing venues.

The mechanical design utilizes the significant standby capacity of the low temperature chiller to charge thermal storage ice tanks to provide HVAC cooling, eliminating the need for a secondary chiller for thermal comfort purposes. A sophisticated variable speed pumping system transfers energy throughout the system and allows simultaneous maintenance of a quality ice sheet while providing comfort conditioning for the facility.

The dual-purpose chiller allows the owner to save operating cost by shaving peak demand and utilizing an advantageous thermal storage electric rate available from the electric utility.

Electrical Engineering

The project features a low-voltage computer-controlled metal halide sports lighting package with full-blackout capability complimented with quartz floodlighting configured for potential future dimming. The control system includes remote touch screen controls/interfaces throughout the facility allowing control ad boards and nearly all the lighting in the facility.

The electrical services included a 3000 amp, 277/480v service and a separate 3000 amp, 120/208v service. The event space floor and perimeter is fully equipped with 5-wire power, communications, and controls for road shows, in-house productions and trade show floor events. Existing emergency power was tapped for emergency lighting and public address sound power.

The electrical design also included an in-house communications system, voice evacuation fire alarm, impaired hearing assist, electronic advertising boards infrastructure, suite access control system, Lynx broadband A/V distribution over CAT 5e cabling, and full communications connectivity.