SKYLINE ENGINEERING LLC

West River Electric

This new multi-phased facility included a 44,000 SF office space and a 42,000 SF indoor parking garage and warehouse area. The new facility design included ground source heat pumps with a 120-ton well field, energy recovery, dedicated outdoor air system, in-floor heat utilizing water-to-heat pumps, pressure wash system, site power re-distribution 1500 KW backup generator (whole-building) and other miscellaneous mechanical and electrical systems.

Project Data

Owner
West River Electric

Location
Rapid City, South Dakota

Building Type
Office Building
Garage/Warehouse

Project Features
44,000 Sq. Ft. Office Building
42,000 Sq. Ft. Indoor Parking Garage and Warehouse

Mechanical Systems
120 ton Ground Source Heat Exchanger
Radiant Floor Served by WWHP
Dedicated Outdoor Air System
Demand Control Ventilation
Energy Recovery

Electrical Systems
Power Service – 2000 amp 277/480v
1500 KW Diesel Backup Generator
Addressable Fire Alarm
Data/Tele Wiring and Connectivity Infrastructure - Building/Site Security
SCADA System Infrastructure

Construction Cost
$10,000,000

Completion Date
2010

Mechanical Engineering

The mechanical system is based on ground source heat pumps to conserve energy. Water-to-air heat pumps provide space heating and cooling for the office areas and water-to-water heat pumps supply heat to the in-floor radiant heating system in the warehouse. Environmentally friendly refrigerants were used throughout the facility.

Ventilation in the office area was provided directly to the heat pumps through a dedicated outdoor air system served by a variable volume air handler incorporating a total energy recovery wheel. Occupancy sensors in conference rooms and other transient occupancy spaces allow the ventilation to be reduced for these areas during unoccupied times.

A demand control ventilation system was utilized in the parking garage and warehouse area. This system conserves energy by incorporating a CO/NOx detection system to start the system only when higher ventilation rates are required.

The facility is served by a wet fire suppression system and includes gaseous fire suppression systems for the server and SCADA rooms.

Electrical Engineering

Project lighting included new site, and access road lighting including site signage and warehouse lighting.

Power distribution was revised to serve 3 new facilities on this project site. The main building power systems for the project included a 2000 amp, 480/277v, service with ground fault protection and step-down to a 1200 amp, 120/208v switchboard. In addition, the entire facility is backed up by a 1500KW diesel generator set with integral 3000 gallon belly tank. The power design also integrated two UPS's to safeguard critical operating systems.

Systems included addressable fire alarm, data and telecommunication wiring and connectivity, infrastructure for future overhead paging, Infrastructure to integrate WRE SCADA systems into new facility, and infrastructure for security CCTV and access for the building and the site access.