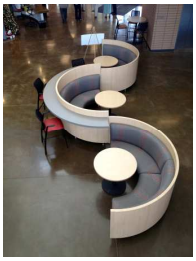

Western Dakota Technical Institute – Mickelson Addition

This 48,500 square foot addition centralized the technical school administration and student services into a single location by creating a one-stop student center. Another major focus of the addition was a new 14,000 square foot joint use city/county/institute library, which was years in the planning.

The project also included a large scale remodel and expansion of the automobile technical program and diesel shop area, as well as a 3,500 square foot addition to the welding program.

Project Data

Owner
State of South Dakota

Location
Rapid City, SD

Building Type
Educational/Technical Institute

Building Area
48,500 SF Addition
20,000 SF Remodel

Mechanical Systems / Features
Central Geothermal Plant
Rotary Screw Heater/Chiller
150 Ton Geothermal Bore Field
Supplemental Condensing Boiler
Interconnection with Existing Plant
Low Temperature Heating
Demand Control Ventilation
High Efficiency Radiant Tube Heat
Vehicle Exhaust System

Electrical Systems / Features
Lighting with Occupancy Controls
1600 Amps of 277/480v Services
Natural Gas Backup Generator
Interactive Learning Whiteboard
Access Security Extension
Addressable Fire Alarm Extension

Construction Cost
$11,400,000

Completion Date
Fall 2012

Mechanical Engineering

The new central geothermal plant serves the new addition and will also be interconnected with the existing boiler and chilled water plant. The interconnection serves a dual purpose as an energy buffer for the new system allowing a reduction in the size of the geothermal bore field, and also increases the efficiency of the existing system.

Energy efficient variable primary pumping systems and a supplemental condensing boiler increase overall plant efficiency and operational savings. Multiple energy source provisions also serve as long term protection against increasing utility rates.

Technical program areas include high efficiency gas radiant tube heat, demand control ventilation, and state-of-the-art vehicle exhaust extraction systems. The welding shop features centralized specialty gas distribution and a 20 station fume exhaust extraction system.

Electrical Engineering

The lighting predominately utilizes efficient troffer fixtures in the classrooms and offices, while occupancy sensors coupled with wall switches offer excellent control and energy efficiency. The library space is illuminated with indirect round pendants to provide smooth and consistent area lighting.

New services include an additional 800 amp, 480v normal service and a 1000 amp 480v heat service entrance to capitalize on advantageous electric utility rates. The life safety and emergency power loads are met by a new 125 kW natural gas backup generator.

Special systems include the extension of paging, fire alarm, and security access systems; infrastructure for computer and overhead projector-based interactive learning board systems; wired and wireless communications; and a category 5e network wired with copper and fiber optic wiring systems.