



Pennington County Jail Annex

The Pennington County Jail project included construction of a new 4-story, 128 bed multi-level security facility with two floors of shelled space for future development. The building is situated on the Courthouse Complex campus, adjacent to the Public Safety Building and the existing Jail. A new connector from the central plant to the facility and a three level parking structure were also included in the project.

Project Data

Owner

Pennington County, South Dakota

Location

Rapid City, SD

Building Type

Institutional

Building Area

92,000 square feet

Mechanical Systems / Features

150 Ton Chiller Plant Addition
1,600 Ton-hours Ice Storage
Fire Pump
Smoke Control
Energy Recovery
Vacuum Waste

Electrical Systems / Features

Vandal Resistant Design
Emergency Generator
Fire Alarm
Fire Fighters Smoke Control
Data/Communications Cabling

Construction Cost

\$10,200,000

Completion Date

March 2006

Mechanical Engineering

The Jail Annex project involved expansion of an existing central plant serving the existing Courthouse, Jail and Public Safety Building. Additions to the central plant included a 150 ton chiller and ten ice storage tanks, resulting in an additional 1,600 ton-hours of capacity. Although the existing boiler plant had enough capacity for the expansion, a new shell-and-tube heat exchanger was required due to the increased pressure imposed on the plant by the height of the new jail annex building.

Plumbing systems included the addition of domestic water heaters, water softening systems and a vacuum waste system for the cells. Skyline Engineering also designed a new fire pump system and an extensive smoke control system for the Jail annex as is often required for institutional facilities.

Precast modular cells were used to accelerate the construction schedule and provide a higher-quality final product. This required intensive coordination between the plumbing, HVAC, fire sprinkler, and electrical systems provided with the cell module to facilitate the field-installed systems.

Electrical Engineering

The nature of the facility dictated the use of high-abuse and security lighting. American Correctional Association lighting levels were modeled and supplemented via the required natural light components. Life safety and egress lighting was supplied from emergency ballast fixtures powered from a 750 KVA diesel generator located on a plaza at ground level. Jail lighting control was integrated with relay panels controlled from the security system.

The electrical service included a 1200 amp, 277/480v service located in the lower-level parking. HVAC systems serving the Annex are powered from the generator life-safety branch to support Smoke Control functions. Skyline Engineering also specified the firefighters control and fire alarm systems, along with their interface with the security electronics and HVAC control systems, satisfying the 1997 UBC Section 905 for smoke control.