

Pennington County Campus Expansion



This phased multi-structure project is situated on a single city block just east of the existing County campus. The initial phase of construction consisted of a new 22,000 SF Evidence Building with an energy plant sized to serve the campus expansion. Once the new Evidence Building was operational, the existing evidence building was removed from the site and a new 100,000 SF Administration Building was constructed in its place.

The Evidence Building includes evidence processing and storage as well as a new forensic evidence laboratory. The Administration building includes all departmental functions requiring public interface (row offices), as well as the critical mission functions of Emergency Management, 911 Dispatch, and Information Technology.

Project Data

Owner

Pennington County

Location

Rapid City, SD

Building Type

Commercial

Building Area

122,000 SF

Mechanical Systems / Features

- Central Geothermal Plant
- Low Temperature Heating
- Laboratory Ventilation
- VAV Air Handling Systems
- Energy Recovery Ventilators
- Variable Primary Pumping
- 300 Ton Geothermal Field

Electrical Systems / Features

- High Efficient FL and LED Lighting
- Occupancy Controls – A/V Integration
- 3 – 277/480v Services from 2 Substations
- 12 - Transfer Switches
- New and Existing Backup Generators
- CAT 6 Communications Connectivity
- 3 - Communications Rooms
- 4 - 30KVA UPS's
- Integration of Security/CCTV
- Integration of Dispatch Radio Comm
- Atomic Clock System
- Addressable Fire Alarm

Estimated Construction Cost

\$22,000,000

Completion Date

Fall 2014

Mechanical Engineering

Mechanical systems are based on low temperature heating water to improve boiler efficiency and allow recovery of condenser heat from the geothermal chiller. Heating and chilled water is provided from a hybrid geothermal central energy plant using a heat recovery chiller with a closed circuit fluid cooler and high efficiency gas boilers. Ventilation was accomplished by VAV air handling systems, demand control ventilation, and energy recovery ventilators.

VAV air handling equipment is housed in a single location for each building to allow centralized system maintenance and increase efficiency of the airside energy recovery equipment. Mechanical design for the Evidence Building includes precision airflow control to maintain space pressure relationships, laboratory gas piping, exhaust snorkels, and laboratory hoods.

Mission critical data rooms are provided with chilled water Computer Room Air Conditioners (CRAC) and a redundant Variable Refrigerant Flow (VRF) heat pump system. Temperature controls are provided by Honeywell.

Electrical Engineering

The project lighting is predominately high efficiency troffers and LED cans. Lighting controls have been integrated with A/V systems where specialized control was required. Outdoor illumination is provided by LED wallpacks and metal halide pole fixtures.

This phased project demands the highest of reliability. Power is provided from three 277/488v, 3-phase services (1 for heat/cool). The two buildings are served from two separate substations, with critical loads backup by a single 500 KVA diesel genset. In addition, the 911 center is equipped with a secondary back up using the existing diesel unit located at the adjacent Jail Annex. In addition, the 911, IT, and EOC Datacenter facilities are powered from redundant Uninterruptable Power Supplies (UPS).

Special systems included four data centers, served by four service providers, interconnected with each other and tied to the West campus, including the dispatch radio towers. Controls, CCTV and Access was integrated with Honeywell.