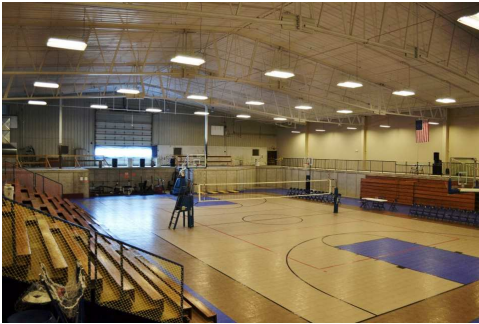


## Rapid City Christian High School



The relocation of the Rapid City Christian High School required an extensive remodel of the Hart Ranch Arena. The existing arena facility, located south of Rapid City, originally included office areas and meeting rooms, but was comprised mainly of a roping arena and stables along each side of the facility. During this multi-phased remodel, these areas have slowly given way to educational functions.

The new educational facility consists of 18 classrooms, a multi-purpose space also serving as a cafeteria, 1000 seat gymnasium with sunken floor, and a 500+ seat theater/chapel with a persimmon wood stage. A football stadium with track has also been developed on the premises.

### Project Data

#### Owner

Rapid City Christian High School

#### Location

Hart Ranch - Rapid City, SD

#### Building Type

Educational

#### Building Area

67,000 square feet

#### Mechanical Systems / Features

Classroom Geothermal Heating & Cooling  
Energy Recovery Ventilators  
Packaged DX Cooling / Gas Heat  
Air Handling Units  
Fabric Ductwork in Gym

#### Electrical Systems / Features

Re-purposed Classroom Lighting  
Fluorescent Gymnasium Lighting  
1800 Amp 208/120v Services  
Theatrical Sound/Lighting & Visual  
TV/Tele/Data Communications

#### Construction Cost

\$4,500,000 (Estimated Total)

#### Completion Date

Phase I – 2006  
Phase II – 2012

### Mechanical Engineering

The Theater/Chapel and Gymnasium systems consist of packaged ground mounted rooftop units with direct expansion cooling and gas fired heating. The Chapel area uses rigid ductwork delivering the heating and cooling air to the space, while the Gymnasium is served by fabric type supply ductwork.

The Classroom HVAC system is served by a geothermal borefield with individual vertical classroom heat pump units. The Chorus and Band areas are served with split-system air conditioning units. Energy Recovery Ventilators precondition the ventilation air serving the Chorus, Band and Locker areas. All systems have stand alone temperature controls.

Plumbing consists of fixtures with infrared sensors in new restrooms and high efficiency water heater.

### Electrical Engineering

The electrical remodel for the facility requires complete renovation of the main floor excluding a few offices. The existing power services are supplemented by a new 1200-amp service panel and new distribution panels for educational and theatrical needs.

Classrooms lighting re-purposed hundreds of gifted recessed lensed troffer fixtures, each re-ballasted and re-lamped. Gym lighting is provided from 8-lamp fluorescent high-bay fixtures. Theatrical lighting is comprised of incandescent cylinders for house and light-bar theatrical fixtures. High-efficiency troffer fixtures with T8 lamps are controlled with occupancy sensors in all other spaces.

Special systems for the facility include: security; theatrical sound, lighting and projection; addressable fire alarm; telephone/data communications; TV/video via Cat 5e cabling; Public Address and Intercom; and a synchronized clock system.