

PLAINS TALK

A Publication of West Plains Engineering, Inc.

Casper WPE: Casper Events Center Completes Major Mechanical Upgrades for Energy Efficiency

• West Plains Engineering performed mechanical and electrical engineering for the recently completed chiller pump project and boiler replacement project for the Casper Events Center in Casper, Wyoming. The near 10,000 seat multi-purpose arena hosts a multitude of major concerts, sporting events, trade shows, conferences and conventions as well as the College National Finals Rodeo. With over 200 events and approximately 300,000 attendees coming through the doors each year, the Casper Events Center is the entertainment center of Wyoming.



With this Wyoming landmark reaching its 30th birthday, the City of Casper took advantage of some energy efficiency grants from the State of Wyoming plus some ARRA funding to upgrade the facility's twelve million BTU heating system. WPE designed a state of the art hybrid boiler system to meet the rigorous heating needs of the Events Center. The hybrid boiler system utilizes a combination of condensing and non-condensing boilers and allowed the Casper Events Center to realize the high efficiency of a fully condensing system, but at a 30% cost savings of installing all condensing boilers. With the budget savings on the project, the City of Casper was able to upgrade the domestic water heating system as

well. The original 2,500 gallon storage tank used to make hot water off the boiler system in the winter and from electric heating elements during the summer. The new domestic water heating system makes hot water off the high efficiency condensing boilers year round with less than 500 gallons of storage. The

reduced storage and elimination of electric water heating will compound the energy savings for the Events Center.

In addition to the hybrid boiler system and domestic water heating system, the project included several other engineering innovations as well. The system incorporated a 650 GPM dual arm smart pump for system distribution, smart circulators for the boiler pumps, and a sequence draft control system for the venting. An engineered stainless steel combined venting system was installed through an existing chase up to the roof, a mere 85 feet above the boiler room floor. The new boiler system has conquered the first heating season reducing gas usage for the Events Center.

Just prior to the heating system

About the Author:
Scott Isenock, P.E. is a Mechanical Engineer in the Casper Office.



Rapid City WPE: National American University, Rapid City, SD

• National American University (NAU) has completed a \$4 million design/build conversion of the old Sodak Gaming warehouse into its new Rapid City campus. The existing warehouse was approximately 25,000 sq. ft. with an addition of 3,725 sq. ft. of office and garage space. The renovation consisted of adding classrooms, lab space, a library, and computer labs. NAU moved from the old downtown Rapid City campus, where it had been based since the 1960's. The newly leased space is adjacent to NAU's national headquarters.

National American University has been expanding rapidly in the last few years and is now up to 37 campuses and online service centers. It is located mostly in the Great Plains area. NAU has an enrollment of approximately 11,000 students, and enrollment at the Rapid City campus is expected to be around 430 students. The new campus now feels like a campus and not the warehouse for which it started. The added office space, façade, and landscaping are designed to appeal to students and people passing by on their way to Mount Rushmore National Memorial.

The new Rapid City campus is a blend of office and teaching spaces. It includes new state-of-the-art science and nursing labs. The science lab contains fume hoods as well as a special snorkel system that will remove unwanted odors and gases from the lab space. The nursing lab contains computer-controlled



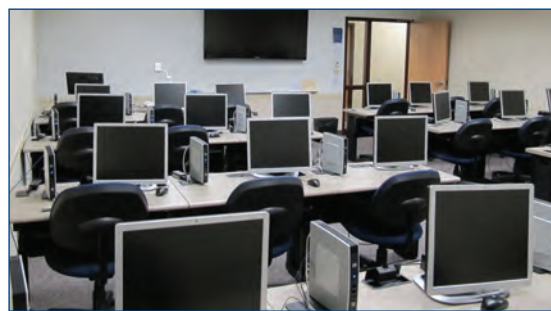
Exterior of the new \$4 million campus



Nursing Lab provides a realistic setting



Science Lab with snorkels and fume hood



State-of-the-art Computer Lab

simulated patient mannequins. The mannequins are used to mimic actual patient symptoms and responses for the nursing students. They are controlled by the instructors from a separate control room. Another part of the nursing program is a mobile nursing lab owned by and used in conjunction with Rapid City Regional Hospital. The remodel included adding a ventilated garage to the facility for the mobile lab. Additional office space was added outside the existing warehouse along the north and east walls.

In addition to the science labs, NAU has added three computer classrooms with new computers. A database administration classroom has an 80" flat-screen monitor for the instructors use. The facility also includes a library and cafeteria.

The design team included Inside Outside Architecture (Architects), Hermanson Egge Engineering (Structural), Fisk Land Surveying & Consulting Engineers (Civil). West Plains Engineering provided electrical and mechanical design services for the facility. The construction team was headed up by Westin Construction Company as the general contractor, Action Mechanical was the HVAC and

plumbing contractor and Conrad's Big C Electric was the electrical contractor.

About the Author:
John Huntley, P.E. is a Mechanical Engineer in the Rapid City Office.



Sioux Falls WPE: Dell Rapids Elementary Quarriers - The Stone is Set

• The students of Dell Rapids Elementary School of Dell Rapids, SD, were outgrowing their existing school. It was small, crowded and lacked proper storage for the teachers. After several bond votes, it was determined a new elementary school would be built. Architecture Incorporated designed the 82,000 square foot facility capable of providing education for over 400 students. The General Contractor, Hoogendoorn Construction Inc, began construction in the fall of 2010. Tessier's Inc, Hander Inc Plumbing & Heating and Dells Electric provided the mechanical and electrical services for the facility.

The new facility is composed of 3 classroom wings, lunch/commons area, administrative offices and a gymnasium. Each grade has 4 classrooms to allow for future growth. The gymnasium was designed to allow for competitive volleyball and basketball.

Each classroom boasts over 1,000 square feet with storage galore and has a Response to Intervention (RTI) Classroom attached to provide one-on-one teaching without removing children from the basic classroom group functions. Each wing has a "Commons" space to allow for each grade to perform group activities in a safe learning environment and not disrupt other classes.

The school desired a high level of technology to ensure that future Quarriers were given the best learn-



The gymnasium at Dell Rapids Elementary



A new hallway to serve young Quarriers

ing environment possible. A smart board located in each classroom will allow optimal teacher/student interaction. Each classroom has wireless capabilities allowing each student to be connected to the outside world via internet. Security cameras were placed in Commons and Playground areas, which connect back to the Administrative desk. These cameras are controlled by a joystick to allow the user to have full vision of all areas.

Each wing has a dedicated air handling unit along with fan-powered VAV boxes to allow each teacher to provide a comfortable learning environ-

ment for the children. Architecture Incorporated also strategically placed skylights and glass curtain walls in corridors and Commons areas to allow natural day lighting. The Commons had motorized shades, surround sound and a motorized screen to create a movie theater atmosphere during the day.

Hoogendoorn Construction worked diligently and was able to complete the school by Thanksgiving, which was well ahead of schedule. This allowed a smooth transition for the entire staff and permitted students to become familiar with their new surroundings before officially beginning school in the new facility on January 4, 2012.



About the Author:
Darlene Weber is an Electrical Designer in the Sioux Falls Office.

• 4609 S. Techlink Circle, Sioux Falls, SD 57106
Phone: (605) 362-3753
Fax: (605) 362-3759

• 1750 Rand Road, Rapid City, SD 57702
Phone: (605) 348-7455
Fax: (605) 348-9445

• 145 S. Durbin, Suite 205, Casper, WY 82601
Phone: (307) 234-9484
Fax: (307) 234-5494

• 215 2nd Ave. SE, Suite 200, Cedar Rapids, IA 52401
Phone: (319) 365-0030
Fax: (319) 365-4122

Casper WPE: Casper Events Center Completes Major Mechanical Upgrades, continued

upgrade, the 1400 GPM existing chilled water system was converted to a primary secondary pumping system. The Casper Events Center replaced 21 existing pumps with 3 new chiller pumps and 2 new variable speed smart pumps for system distribution. The heating and cooling pump upgrades combined with the recently completed lighting upgrades have also realized a significant reduction in electric energy usage as



Boiler system upgrades meet Events Center demands

well.

The Owner of this facility is the City of Casper. Others who worked with WPE to make this project a success were Mechanical Contractor (Heating Water System) – Davidson Mechanical; Sheet Metal Contractor (Boiler Flue/Intake) – Casper Tin Shop; Mechanical Contractor

(Chilled Water System) – Mechanical Systems, Inc.

WPE COMPANY NEWS ★ WPE COMPANY NEWS ★ WPE COMPANY NEWS

• Congratulations...to **Isaac Anderson** who recently passed his P.E. Test. He is a mechanical engineer in the Sioux Falls Office and has been with West Plains Engineering since 2007.

• WPE wishes to congratulate **Darlene Weber**, of the Sioux Falls office, for completing the Certified Lighting Efficiency Professional (CLEP) certification. She is just the second person in South Dakota to achieve this certification and one of 363 recipients in the country.

The Association of Energy Engineers is a membership of 16,000 professionals in 89 countries that provides information and networking in the fields of energy management, renewable and alternative fuels, power generation, energy services and sustainability. It is also widely recognized for its energy certification programs. One of these programs is the Certified Lighting Efficiency Professional (CLEP). CLEP is designed to provide recognition for professionals who have distinguished themselves as leaders

in the field of lighting efficiency. The designation CLEP identifies individuals who have demonstrated high levels of experience, competence, proficiency, and ethical fitness, bringing to their professional activities the full scope of knowledge requisite to the development and implementation of effective lighting efficiency solutions. Candidates for the CLEP certification must attend one of AEE's preparatory CLEP training seminars and pass the four-hour written CLEP examination.