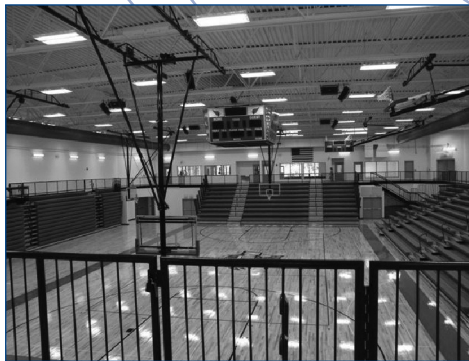


PLAINS TALK

Cedar Rapids WPE: Maquoketa High School Gym Addition, Maquoketa, Iowa

• When the Maquoketa Community School District decided to construct a new gymnasium, they went all out. The \$6.6 million, 49,000 square foot project consisted of a large addition to the front of the school and remodeling the existing cafeteria, kitchen, and office areas. The addition includes a new front entrance and lobby area featuring a large clerestory. The addition also included the gym, with its main entrance off the east end of the lobby. The gym is a “sunken” style, which means that people enter at the top of the gym. A walking track encircles the entire gym at this upper level to allow traffic flow to the bleachers below. The walking track also leads to a new two-story area on the far side of the gym. Rooms include a fitness room, multi-purpose room, wrestling room, locker rooms, coaches’ locker rooms, and mechanical/electrical room.

The gym has fixed seating for 1,640 people, but is capable of holding up to 1,900 people if needed. The original gymnasium, built in 1964, could seat only around 700 people. With the



Overlooking the new gymnasium from the walking track that encircles the gym.

bleachers retracted, there is room for two full basketball courts side by side. And, of course, a big red cardinal is located at the center of the main basketball court! This is an impressive facility for a community of under 6,000 people.

The HVAC system for the gym includes two large air handling units that distribute air via fabric ductwork high in the space. The ductwork was made part of the color scheme of the gym by finishing it in cardinal red, one of the school colors. The gym is also fully air conditioned.

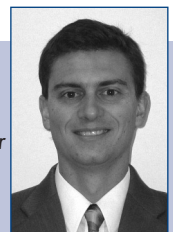
The lighting in the gym consists of fluorescent light fixtures with T5 high output lamps, which are controlled through a programmable lighting

control system. This system easily allows different lighting levels and different areas of the gym to be illuminated for the many functions that happen in the gym.

Other features in the gym include motorized bleachers, motorized basketball hoops, a large scoreboard suspended above center court, and a premium sound system with sub-woofers that get attention. All this and much more give this impressive facility a “wow” factor that is not found in most high school gyms.

Ament, Inc. of Cedar Rapids served as the project architect and civil engineer, M2B Structural Engineers of Cedar Rapids served as the structural engineer, and Septagon Construction of Cedar Rapids was the construction manager. West Plains Engineering provided mechanical and electrical design services. Construction was completed in 2008.

About the Author:
Jeff Reinhart is the Office Manager and an Electrical Engineer in the Cedar Rapids Office. Jeff has been with WPE for six years.



Did You Know?

• WPE has been using the REVIT design and drafting program for the past two years and to date 30 employees have been trained on REVIT MEP. WPE has worked on ten projects in the REVIT format. See the Winter 2009 issue for the article on REVIT.

Rapid City WPE: Reflections on “Change”

• Some welcome it, some dread it. Some run from it, some pursue it. Everywhere you look, something is changing.

As consulting engineers, we do our best to design systems that work well and can be maintained, modified and expanded. We advise our clients, based on what we know; however, we can't continually follow the same path because things change. Rules change, tax incentives and laws change.

James York said “The most successful people are those who are good at Plan B.” It is important to know what you can and need to do when the rules change. As the country tries to reduce its dependence on foreign oil, we affect the price on other energy sources. As the

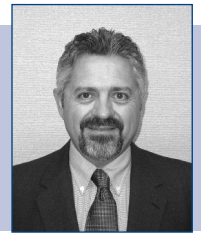
sustainability movement goes forward, new products are developed that challenge us to rethink the applications for our clients. LEED v3 is changing as it is being implemented.

As ‘Cap and Trade Legislation’ is being debated in Washington, many speculate on the affect, good and bad. Something will certainly be different as this type of legislation is passed and implemented.

Remember your Plan B, but don't be too rigid, you may need to change it.

About the Author:

Doug Feterl is a Mechanical Engineer/Office Manager for the Rapid City office and has been with West Plains Engineering for 17 years.



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NEW EMPLOYEE—Sioux Falls

Dewayne Larson rejoined the Sioux Falls Office staff in January 2009 as a CADD technician. Dewayne graduated from Black Hills State and previously worked at Miller Sellers Heroux Architects. He brings to West Plains Engineering five years of Revit experience along with 20 years working in the architectural field. In his spare time, Dewayne enjoys spending time with his family, engaging in church activities and riding his Harley.



NEW EMPLOYEE—Rapid City

Matt VonHaden joined the Rapid City office in June as an electrical designer. He graduated from the South Dakota School of Mines in 2004. After graduating, Matt worked for PE Group in Parker, South Dakota as an electrical engineer. Matt is married to Morgan and they have one son, Logan. Matt enjoys the outdoors and spending time with his family.



CONGRATULATIONS!

Congratulations to Todd Weidner who passed the LEED AP Exam on June 26, 2009.

CONGRATULATIONS!

To Chuck & Holly Hauck on the birth of their son Ethan Harry Hauck, born on August 6, 2009 weighing 8lbs, 13 oz. and was 20 1/2 inches long at birth.

Casper WPE: Lowe's Discovery Lab & Children's Village at Cheyenne Botanic Gardens

• The Cheyenne Botanic Gardens has been operating in Cheyenne, Wyoming for the past 32 years. It was founded in 1977 to provide low-income residents a place to grow food and create meaningful volunteer opportunities for senior citizens, the disabled, and at-risk youth. The Botanic Gardens started out as a two-acre lot and has grown to be nine acres. To this day the volunteer program still exists. Last year there were 154 volunteers donating a total of 5,373 hours of their time.

Since the founding of the Cheyenne Botanic Gardens in 1977, it has been practicing and teaching sustainable technologies. The Gardens use both low and high tech methods to reduce energy consumption and maximize efficiency. The greenhouse is equipped with water barrels lining both inner and outer walls to absorb solar energy and moderate greenhouse temperature. There are also photovoltaic cells that capture and store the sun's energy, resulting in a greenhouse that is 100 percent solar heated and 50 percent solar powered.

The latest project is also the largest to date. In 2009, Cheyenne Botanic Gardens will open its doors to a new science center and interactive garden for children. The mission of the Discovery Lab is to teach sustainable living to the next generation. This mission was the driving force for the building design, location, and curriculum. The architect for the project was The Design Studio, Inc., West Plains Engineering, Inc., provided mechanical and electrical design services, Colorado State University was the LEED consultant, and EDAW/AECOM engineered the landscape design. The project incorporates many different strategies, from wind and solar energy to water conservation techniques. These strategies were used to optimize energy performance by at least 18 percent above a standard office building this size, and recent calculations show that it's actually achieving 35 percent optimization.

The sustainable features used to achieve this

optimization rate on energy consumption included: day-lighting the classroom space, shading devices at south faced glazing in classroom, optimizing the level of insulation in walls and roofs that were previously



un-insulated while maintaining the aesthetic of the existing wood trussed roof and stone walls, using solar panels to run the in-floor radiant heating, natural ventilation, fluorescent lighting operated by occupancy sensors, photocell sensors and lighting controls, a vertical axis wind turbine suitable for urban applications, as well as EnergyStar appliances. In order to

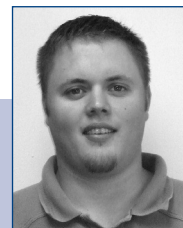
maximize water conservation, the irrigation system uses non-potable water at night but during the day utilizes potable water for safety purposes. Waterless urinals were also implemented along with low flow lavatories and toilets that were automatically controlled.

Not only is the building a science center, but the landscape around the building acts as an interactive garden. Landscape architect Herb Schaal of EDAW has put together a world class design that uses the three-quarter acre courtyard as a combination of natural wetland, garden crops, xeriscape, secret garden, living maze, craft area and picnic orchard. A walking path winds through all the different areas of the exterior design.

When completed, the Children's Village in Cheyenne, Wyoming will rival big city gardens, and actually end up being bigger than a recently completed children's garden in Cleveland. The Discovery Lab has applied for certification as a LEED Platinum building, and by the end of 2009 the process should be complete. As a LEED Certified building, it will raise the project's profile and allow others to learn from many years of low cost sustainable work.

About the Author:

Brian Ames is a Mechanical Engineer in the Casper Office and has been with West Plains Engineering for over a year.



• 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

Sioux Falls WPE: West Plains Engineering Focuses On Safety First at SDSU

• Over the past 18 months, South Dakota State University has been updating their fire alarm systems across the campus with funding from a Life Safety Grant. These upgrades are a series of phased events.

Phase I upgrades were completed last summer with updated fire alarm systems in the Agricultural Engineering building, the Intramural Building, Pierson Hall which is one of the dormitories and a new system for the Central Heating Plant. The most challenging building in this phase was the Central Heating Plant. Because of the coal fired boiler system the fire alarm system was susceptible to large quantities of coal dust. Through discussion with the local Fire Marshall it was determined since the building was continuously staffed, the majority of the building required just notification and annunciation devices with select areas such as the coal storage room and offices requiring detection. The combined square footage of these buildings was 173,738. The cost per square foot on these buildings averaged out to \$1.59. The contractor for Phase I was Englestad Electric of Watertown, SD.

Phase II consists of Harding Hall, the electrical engineering and math building, Lincoln Music Hall, Pugsley Continuing Education Center and the Rotunda for Arts & Sciences. These buildings are slated to be completed before school begins this fall. The most challenging building of this phase is Lincoln Music Hall. The building is approximately 100 years old and has many very nice finishes that we made every effort to maintain. Beam-style smoke detectors were used in the performance hall so devices would not compromise the beauty of the lofty, arched ceiling. The basement of Lincoln Music Hall presented another challenge. The music department has sound-proof booths for practice purposes. The sound proofing of the booths would make it difficult for the musician to hear the alarm so strobes were placed to allow visibility from each booth. The cost per square foot of these buildings averaged \$1.65. The contractor is Electric Construction of Sioux Falls, SD.



The Physical Education Center/Frost Arena and DePuy Military Hall comprise Phase III of this project. These buildings are also scheduled to be finished before classes resume this fall. The gymnasium area of the Physical Education Center has been the biggest challenge of this phase. The detection is accomplished by the use of beam detectors and duct detectors in the air

handling units. Placement of the duct detectors to provide the necessary coverage and ease of service for the user was a concern. The gross square footage of this phase is 162,813 and a cost of just \$.61 per square foot. We believe that the relatively low cost per square foot is attributed to three factors. The winning bidder was able to minimize his mobilization costs because he was already working in the Physical Education Center on another project, the openness of the space in these buildings, as well as a very competitive economy. The contractor is Brookings Electric of Brookings, SD.

Presently we are wrapping up Phase IV, which consists of: Briggs Library, the Facilities and Services Shop, Scobey Hall and Wenona Hall. Three other buildings will bid as alternates. If the bidding falls within the funds available in the Life Safety grant, the Agricultural Heritage Museum, the Animal Science Arena and the Nursing, Family & Consumer Sciences & Arts & Sciences Building will also be updated. This phase will bid in the Fall and has a total square footage of 325,657.

West Plains Engineering is also in preliminary design of a Fire Alarm Upgrade for the South Dakota State Penitentiary in Sioux Falls. The original buildings dating back to 1881 will receive the upgrades. The correctional aspect and age of the buildings of this project will add some new challenges.

About the Author:

Darlene Weber is an Electrical Design Staff in the Sioux Falls office and has been with West Plains Engineering for over five years.

