

# PLAINS TALK



## Rapid City WPE: SD Army National Guard, Mobridge

### Did You Know?

• The American Council of Engineering Companies (ACEC) of South Dakota has awarded both West Plains Engineering and the South Dakota Army National Guard with a Merit Award in recognition for entry in the 2008 Engineering Excellence Awards Program. Read more in the article to the right.

Plains Talk is a quarterly publication of West Plains Engineering, Inc. in which we highlight a few of our most interesting projects. Your comments are welcome at any of our locations listed on the back cover of this newsletter.

• The South Dakota Army National Guard (SDARNG) Readiness Center is a new facility located in Mobridge, South



Dakota. The new facility replaces an existing outdated armory that was constructed in 1965 serving the 200th Engineering Company. This new 18,000 square foot training center was once a landfill donated to the State, consisting of an assembly hall surrounded by administrative offices, classrooms, physical fitness area, kitchen, locker and unit storage areas. Not only does the facility better serve the South Dakota Army National Guard in providing a state-of-the-art training facility, but also provides community service to the City of Mobridge by providing space for additional State Offices.

Dedication and commitment of the community, the state legislature, Governors' Office, and the Federal Government contributed to the success of this new facility. Their goal was to replace the existing aging facility with a new modern, energy efficient building that included mechanical and electrical systems flexible enough to accommodate the diverse occupancy.

It was the South Dakota Department

of Military Affairs along with the National Guard Bureau's intent to design and construct this facility to meet the Military "Sustainable Project Rating Tool

("SPiRiT") requirements with a certification level of "silver." SPiRiT was the predecessor to the current US Green Building LEED rating system.

West Plains Engineering, Inc. worked closely with the Engineering Supervisor for the South Dakota Army National Guard, the Department of Military and Veterans Affairs, TSP Three, Inc., and the Project Architect, to design energy efficient mechanical and electrical systems. With the SPiRiT mandate in mind, West Plains Engineering evaluated and analyzed various mechanical heating and cooling systems through computer modeling to determine the best solution meeting life cycle cost, sustainability, and energy efficiency. An earth coupled geothermal heat pump system resulted in the best space heating and cooling system for this building with the added flexibility to accommodate the fluctuating occupancies therein.

The Readiness Center is served by a water-to-air heat pump system utilizing a ground source geothermal well field.

The well field consists

continued, p.3

# Cedar Rapids WPE: The Flood of 2008!

• Someone declared 2008 to be the “Year of the River” in Cedar Rapids. I guess you need to be careful what you ask for.

The Cedar River began to rise above flood stage on Sunday, June 8th. Things were starting to look bad for downtown Cedar Rapids by June 11th. In just a few days the river crested over 31 feet at with water retreating into the streets of downtown. Despite several days spent preparing for the approaching high water, Cedar Rapids couldn’t avoid being hit hard. Rescuers had to use boats to reach some of the residents stranded in 3,900 homes. Cedar Rapids experienced unprecedented flooding following near record snow fall and rain. With the West Plains Engineering, Inc. office located in the heart of downtown the experience was surreal.

The direct effect of the flood to the Cedar Rapids Office was on June 11th when we sealed off the front entrance and began sand-bagging. Within a few days 4 ½ feet of water filled our front lobby. Fortunately, the WPE office is on the second floor and office space was not directly impacted by the severe water damage. On Father’s Day, Jeff Reinhart and Justin Cooper were escorted by the Cedar Rapids Fire Department back to the office for the first time.

Thanks to Adfinity Marketing Group, we were able to set up a temporary office at our previous location at 800 – 1st Avenue. For five weeks, they provided us space in their upper level which previously served as their break room. Having very limited space, we were able to



set up our office using a ping pong table, folding chairs and whatever was around to continue business.

About 1,300 city blocks, which was most of the downtown area, was flooded. More than a thousand small businesses were affected and an estimated 9,000 workers were displaced. Restaurants, “mom and pop” stores, and many long-established family businesses had been left with lingering smells of stale sewage water, blown out windows and brown soiled walls and furniture.

A preliminary estimate of flood losses and rebuilding needs delivered by the City to Sen. Chuck Grassley’s office in July totaled more than \$2.4 billion; which included an estimate of \$336 million in business damages set apart from inventory, equipment losses or business interruption losses. When you consider these are only Cedar Rapids’ losses, it becomes easier to believe how

some officials predict the Eastern Iowa flood losses will amount to one of the Top Five natural disasters in U.S. History.

Progress continues in Cedar Rapids as residents rebuild their homes and businesses. More businesses are reopening though the recovery of Cedar Rapids and surrounding areas will continue for years to come.



*About the Author:*

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## WPE COMPANY NEWS ☆ WPE COMPANY NEWS ☆ WPE COMPANY NEWS

### NEW EMPLOYEES—Sioux Falls

West Plains Engineering welcomes Office Assistant Lenn George to the Sioux Falls Office. Lenn joined the Sioux Falls office in August 2008 bringing 16 years of corporate healthcare and marketing. She has a year towards her Masters in Mass Communications, minor Business Management. She and her husband, Orlando, have four children, 23 year old twin boys, 15 and 12 year old daughters. In her spare time, Lenn enjoys working at her local church as the Co-Pastor.

### CONGRATULATIONS!!!

—Justin & Emily Cooper celebrated the birth of their son Logan

Talen Cooper on November 7th at 5:02 pm. At birth, Logan weighed 9lbs. 6 oz and was 20” long.

—We congratulate Jeremy Goodroad and Brandon White for their accomplishment in becoming LEED Accredited Professionals. Becoming a LEED AP demonstrates they have a thorough understanding of green building practices and principles along with the LEED Rating System. West Plains has a total of seven LEED Accredited Professionals. Others include: Michael Heinrich, P.E., Mechanical Engineer; Marty Christensen, P.E., Mechanical Engineer; Daren Beckloff, P.E., Electrical Engineer; Doug Feterl, P.E., Mechanical Engineer; and Scott Isenock, P.E., Mechanical Engineer.

## Casper WPE: Sheridan Upgrades to Induction Lighting

• The City of Sheridan, Wyoming, is currently planning an enhancement to approximately 1.25 miles of the north portion of Main Street, from First Street to Fort Road.

Spearheaded by EnTech, Inc., a local engineering firm, the project includes a complete reconstruction of the roadway and pedestrian facilities, as well as the replacement of the underlying storm drain, sanitary sewer and water mains. Additionally, in an effort to revitalize the North Main corridor, the project includes amenities such as benches, trees, colored concrete and new decorative street lighting. West Plains Engineering Casper office, has been brought on board to assist with the design of the new street lights, which will include both traditional "cobra head" style fixtures at intersections, and decorative poles along the street. The project is in the design stage, with an expected bid date sometime in the late fall or early winter of 2009.

In an effort to reduce energy consumption and maintenance costs, the City of Sheridan has opted to utilize induction lamps for the decorative fixtures. Induction sources provide whiter light than traditional high pressure sodium fixtures. It also offers color rendering equal to that



of most fluorescent sources. More importantly, induction lamps use electrodeless technology which greatly increases their lifespan, averaging 100,000 hours of operation.

Operating eight hours a day, they should last for over 34 years! The generators (think "ballasts") for the lamps are also rated for 100,000 hours. They perform superbly in both the heat of summer and cold of winter, and output more light per watt than even LED sources.

In an effort to reduce light pollution, the City also ensured that the fixture they selected incorporated cutoff optics, which minimizes uplight and directs the light to the surfaces that need it.

West Plains Engineering is working closely with EnTech, the City of Sheridan, and Mountain States Lighting to ensure the finished product will provide functional and aesthetically pleasing lighting that will last for many years of low-maintenance

operation.

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## Rapid City WPE: SD Army National Guard, Mobridge (continued)

of 81 wells, approximately 200 feet deep and 25 feet apart (9 circuits of 9 wells/circuit) to support the facilities' heating and cooling load. The geothermal piping system is a closed loop water circulating system utilizing the well field as a heat sink. The water circulates through the well field and to the heat pumps. Heat is either absorbed or rejected to the water by the heat pumps, depending on whether they are providing heating or cooling to the building. The circulating water system then transfers this rejected heating or cooling energy to the earth through the well field. The relatively constant circulating water temperature provided by the well field, allows the water source heat pumps to operate in their most efficient manner. Other energy saving techniques such as variable speed pumping is incorporated into this system to increase electrical efficiency.

Maintaining indoor air quality in these types of randomly-occupied facilities can be a source of abnormally high energy consumptions. Indoor air quality is maintained by the introduction of fresh outdoor air. Heat recovery and state-of-the-art temperature control systems were utilized to provide the necessary ventilation to meet indoor air quality requirements and still maintain the National

Guard Bureau mandate for energy efficiency.

This energy efficient system achieves a reliable, environmental friendly, thermally efficient heating and cooling system proven to greatly reduce heating and cooling costs. The success, simplicity, and energy efficiency of this geothermal system has led to the consideration of using geothermal as a model in future buildings for the South Dakota Army National Guard.

The South Dakota Army National Guard is pleased with the outcome of the design, construction, and operation of the ground source geothermal water source heat pump system, and is currently completing the application for SPiRiT Certification. In addition, the American Council of Engineering Companies (ACEC) of South Dakota has awarded both West Plains Engineering and the South Dakota Army National Guard with a Merit Award in recognition for entry in the 2008 Engineering Excellence Awards Program.

*About the Author:*

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## West Plains Engineering, Inc. Prepares for Building Information Modeling

• Wikipedia has described Building Information Modeling as: “The process of generating and managing building data during its life cycle. Typically it uses three-dimensional, real-time, dynamic building modeling software to increase productivity in building design and construction. The process produces the Building Information Model (also abbreviated BIM), which encompasses building geometry, spatial relationships, geographic information, quantities and properties of building components.”

The National Building Information Modeling Standard (NBIMS) has stated its vision for “an improved planning, design, construction, operation, and maintenance process using a standardized machine-readable information model for each facility, new or old, which contains all appropriate information, created or gathered about that facility in a format useable by all throughout its lifecycle.”

The process of BIM involves all members of the design, construction and ownership team to provide an integrated approach to the project delivery system. Through the BIM process, team members will benefit from a collaborative approach to creating, sharing and implementing various aspects of the project information. All members involved with a project will share project data as frequently as desired – sometimes instantly – which will allow for a much more seamless integration between disciplines. All information entered into these models is tracked through the use of databases which enables better cost management through the design process. Added benefits of the software packages available include a decreased number of design or construction conflicts, and improved object collision avoidance. A key to the success to any model is the ability to capture, organize and transfer the information from that model to the end user and to create it to be machine-readable.

While many of the benefits will be noticed in the design and construction phases of a project, Owners will

also see benefits of a successful BIM project post move-in. Facility operators and owners are likely to create a collection of both as-built and as-maintained files to track all aspects of their project. These files will include information regarding various aspects of the project and may be updated as renovations or upgrades to existing facilities occur.

As noted in the Wikipedia description, BIM is a process which has become a very valuable tool for many participants in the capital facilities industry. BIM has often been incorrectly referenced as a software package. The various software packages which are on the market are useful tools in this process of BIM, but they are not BIM and BIM is not any one of these packages. West Plains Engineering, Inc. has opted to run Autodesk Revit as our software platform to deliver a BIM solution for our clients. As many firms before us have learned, the process of converting from a CAD package to a BIM solution is proving to be a larger jump than moving from hand-drafting to CAD was nearly two decades ago. There is a complex set of information and drawing detail to be entered in the BIM solution which must work together with all disciplines. Over one half of our employees have been through training on the Revit software package and we have worked on and completed several projects within Revit.

WPE, Inc. is excited about moving into this new realm of Building Information Modeling and providing our clients with a more detailed and better coordinated product. The move toward a BIM environment will complement our commitment to sustainable design along with our work on LEED registered and certified projects.

*About the Author:*

**Marten Christensen** is the Mechanical Department Head in the Sioux Falls Office. He has been with WPE for 14 years.

