

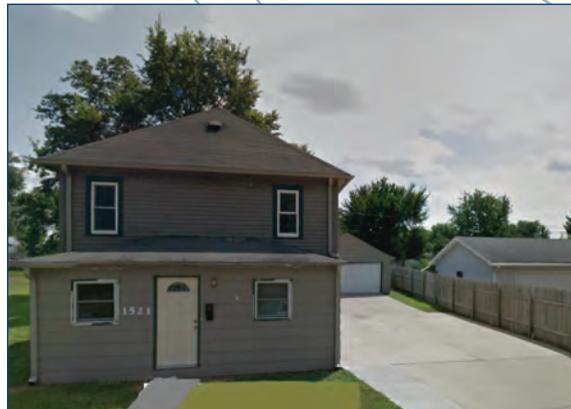
# PLAINS TALK

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## Sioux Falls WPE: Sioux Falls Affordable Housing – “Help for Those in Need”

• Sioux Falls Affordable Housing Solutions philosophy is that every family deserves a place to call home. To facilitate this philosophy, the organization purchases dilapidated properties in Sioux Falls and either rehabs them or tears them down and replaces them with new houses. The new houses are sold to households with an income of less than 80% of the area median income. They also provide multi-family housing to rent to individuals with an income less than 40% of the area median income.

On October 1, 2013 ground breaking was held for the newest of these projects, Highland Five Homes. This project was the result of a Design Competition presented by Architecture for Humanity – Sioux Falls and sponsored by the City of Sioux Falls Community Development Office and Affordable Housing Solutions. The objective of the contest was to design a functional, Energy Star 2009 attainable apartment complex with five to six units for under \$300,000 (including materials and construction costs) and no greater than 3,600 total interior square feet. The win-



*The original house*

ning entry was donated by Co-op Architecture, West Plains Engineering, Rise Incorporated and Confluence Landscape Architects. With funding from multiple sources, including Wesley United Methodist Church, First Congregational United Church of Christ, Federal, State and City entities, this project will become a reality.

Highland Five homes will consist of five one-bedroom townhomes featuring a clerestory in the living space, pergolas over the unit entries, patios on the back and raised planting beds for the residents to use for flowers and vegetables. The youth group from Wesley United Methodist Church will assist the residents in maintaining the planting beds. Completion of this



*The proposed new multi-family dwelling unit*

project is anticipated in the spring of 2014.

About the Author:  
**Darlene Weber** is an  
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# WPE Power Division: The NRPPD Rush Creek Substation

• The Rush Creek substation located four miles south of Rushville Nebraska is the newest substation belonging to Northwest Rural Public Power District (NRPPD) in Hay Springs, NE. Commissioned in May of 2013 the Rush Creek substation greatly enhances the reliability of the electrical services provided by NRPPD on the eastern half of their system.



in service and ensuring reliability into the future were just a few of the motivating factors for the modernized plan used in this design.

The 10/14 MVA transformer purchased by NRPPD was manufactured in Goldsboro, NC by SPX-Waukesha and delivered to the substation site nearly

For a number of years the Management of NRPPD knew that enhancing the eastern portion of the system with a new substation was in order. However, without a significant load increase it was difficult to justify construction of a new substation to support the heavily loaded Gordon facility. Management knew that the next substation should be located between the existing Flats, Gordon, and Hay Springs facilities to allow it to back up any one of the other three substations when required. In 2009 the general location for the new substation was identified and the preliminary design was started. In early 2011 NRPPD was contacted by a member with plans to add 2600 horse power of electric load south of Rushville. Suddenly, the need of a new substation became a priority.

The initial plan for the new substation was for it to resemble the existing Crow Butte substation near Crawford, NE built in 1993. However, with newer technology and a host of modern equipment to choose from, the resemblance is limited to physical layout and the material used to construct and support the bus. The climate controlled building is much more spacious than the one found at Crow Butte, and houses a robust battery backup system as well as modern electronic protective relays, metering equipment, and SCADA communications. The upgrades selected were relatively easy decisions based on the increase in reliability added to the design, and the protective features now available for a modern medium voltage substation. Considering the investment dollars necessary for the purchase of major substation equipment, along with the fact that replacement spares are not kept readily available, protecting this equipment was a paramount concern for the staff of NRPPD. Keeping this valuable equipment

three months ahead of schedule. The high-side protection scheme chosen for this facility incorporates a Siemens SDV7 breaker controlled by two SEL digital relays. The two-relay scheme may seem a bit redundant, but for around 2% of the cost of the transformer, this idea was implemented as a part of the increased reliability plan mentioned previously. In the unlikely event of a relay failure, the second relay would still provide NRPPD with a fully functioning substation until a replacement unit could be arranged.

Like many distribution substations, the transformer secondary voltage is regulated prior to the feeder reclosers. However, unique to NRPPD substations, the load-side of the three NOVA reclosers are all fed via 500 kcmil to an S&C PMH-10 switch before exiting the substation. With the addition of a three-phase overhead gang switch, and cleverly routing the 500 kcmil conductor from the PMH-10 back through the switch to the secondary bus, NRPPD has the ability to backfeed any one of the three circuits served by this configuration. This arrangement also enhances system reliability and increases maintenance flexibility for the feeder reclosers, should one happen to fail.

The design and construction schedule for this project was 24 months. The station was brought on line three months ahead of schedule. Without a doubt this project greatly enhances the ability of NRPPD to provide reliable and cost effective electricity to many of its members in western Nebraska.

About the Author:

**Kevin Groves** is an Electrical Engineer and the Power Engineering Division Manager located in the Rapid City Office.



# Rapid City WPE: The Michael J. Fitzmaurice State Veteran's Home

• The Dakota Territorial Legislature met in February of 1889. While in session, they passed a bill establishing the Dakota Soldiers' Home to be located in Hot Springs, South Dakota. The bill carried an appropriation of \$45,000 for construction. The objective of the Home was to provide the care and subsistence for Veterans and their spouses and widows who met eligibility requirements for admission to the Home. The cornerstone of the first building was placed on November 11, 1889. This building remains in service and houses the Home's administrative offices and recreational facilities. On October 3, 1998, Governor William J. Janklow and Major General Phillip Killey dedicated the South Dakota State Veterans Home to Congressional Medal of Honor Recipient "Michael J. Fitzmaurice." The Medal of Honor is the highest award for valor in action against an enemy force which can be bestowed upon an individual serving in the Armed Services of the United States.

Ever since its construction and opening the Veterans' Home and its staff have been recognized as a leader for the compassionate care of our Veterans. In 2010 the design was started for a long overdue replacement facility. The new state of the art facility will provide the staff with a much more efficient building for which to house and care for the Veterans.

The new facility consists of 100 residential rooms (52 skilled and 48 independent living). The two story facility will have eight neighborhoods/households arranged around



*Rendering of the new State Veteran's Home*



*The existing State Veteran's Home*

administrative and support amenities.

The facility has been designed to provide an energy efficiency that is anticipated to be 24% more efficient than the requirements set forth in ASHRAE 90.1. This means this facility will use nearly 25% less energy than a typical building.

The facility will be served by a new Biomass Boiler plant that will use waste shavings and other waste wood materials from sawmills as a fuel source. The Biomass Boiler plant will provide a very economical heating source for the facility using this renewable energy source.

The design for the new facility was lead by TSP, Inc. TSP provided Architectural, Structural and Civil Design. West Plains Engineering provided Mechanical and Electrical Design. Designworks, Inc. provided the Landscape Architecture. Scull Construction is the Contract Manager At Risk for the project. Major subcontractors and contributors to this project are Action Mechanical and Muth Electric.

The project is currently under construction with an anticipated opening for the new facility in the fall of 2015.



*About the Author:*  
**Mike Sigman** is an Electrical Engineer and Rapid City Office Manager

## WPE COMPANY NEWS • WPE COMPANY NEWS

• **Darrin Tille**...was recently elected Fire Chief of the Split Rock Volunteer Fire Department on October 3, 2013. Darrin has been a volunteer fireman since 2005. Previously, he has held the department elected positions of 2nd Assistant Chief, President of the Board of Directors, Member-at-Large on the Board of Directors, and Department Recorder. Darrin is a Mechanical Designer in the Sioux Falls Office.

• **Justin Henning**...received a warm welcome back to WPE. A welcome home ceremony was held for 124 soldiers of the SDARNG 235<sup>th</sup> Military Police Company in December 2013 from a tour of duty in Afghanistan. The unit returned to the United States on December 14<sup>th</sup>. The mission of 235<sup>th</sup>



overseas was to provide security for US Military personnel, installations and facilities. Justin is a CAD Technician in the Sioux Falls Office.

• **Isaac Anderson**...and wife Sue welcomed new baby boy Benjamin Thomas. Benjamin was born on January 24<sup>th</sup> at 4:22 am weighing 5 lbs, 12 oz. and 19" long. Isaac is a mechanical engineer in the Sioux Falls office.

• **Melanie Raap**...and husband Jeremy welcomed new baby girl Nevaeh Wilamena. Nevaeh was born on January 7th weighing 7 lbs, 5 oz. and 19" long. Melanie is an electrical engineer in the Sioux Falls office.

• **Brian Ames**...recently passed his P.E. Test. He is a mechanical engineer in the Casper, WY office and has been with West Plains Engineering since 2008.

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## West Plains Engineering Design Conference 2013

• West Plains Engineering believes it is important to provide educational opportunities for our employees to maintain a high standard of service to our clients. One venue we use is the West Plains Engineering Design Conference. The 2013 Design Conference was held at Cedar Shore Resort in Oacoma, South Dakota. The conference allows employees to share project and technical knowledge across the company, as well as some time to participate in some competitive team building, fun exercises. This past year's design competition once again proved that a random group of engineers can be very creative and competitive when designing and constructing an apparatus. The objective of each team was to create a simple or complex machines from a box of supplies provided to each team which was to move the round object with accuracy and distance (create a catapult to throw a ball the size of a golf ball). There were a total of nine teams who participated, with our top two teams finishing only one point apart from each other.



*Teams prepare to present their catapult to the company*



*Staff brainstorming over the contents of their team building exercise*



*Competition Line Up...Ready for Action!*



*Kevin Groves presents at the Design Conference*