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# PLAINS TALK

A Publication of West Plains Engineering, Inc.

## Spring Issue 2016

Bringing Projects to Life with 3D Modeling  
 With Power Comes Risk: Shine Brothers/TJN Enterprises  
 Summers Are Meant to Shine: Downtown Laramie Lighting

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## NEW LOOK!

It's been our pleasure to bring you Plains Talk for more than a decade. We hope you enjoy the new look, which includes all the same engineer-authored articles, now with more photos and bonus online content.

MECHANICAL ELECTRICAL PLUMBING POWER

AN ENGINEERING SOLUTION CENTER



## Summers are Meant to Shine

Jeff Eidsness, Electrical Engineer | Casper, WY



### DOWNTOWN LARAMIE LIGHTING IMPROVEMENTS

Downtown Laramie is the picture of Wyoming culture. The city's identity stems from its origins as a railroad and cowboy town, but it also includes a vibrant progressive college community.

In 2012, West Plains Engineering was asked to help with downtown revitalization efforts by improving lighting function and form throughout the popular corridor. The project consisted of the replacement of select decorative and cobra head fixtures, as well as a completely new power distribution system to address grounding and overcurrent protection issues. Two new services were added, and new conduit and conductors were installed to the new and existing fixtures. Each new and existing pole was also equipped with a new GFI-protected receptacle, and fusing was coordinated with City personnel to allow for diverse loads at multiple locations.



Ultimately, by working closely with the City of Laramie, our team was able to conduct studies and progress through design and construction administration services to develop a completely new, more efficient power distribution system - while keeping with the historic look and feel of the space.

Today, citizens and tourists enjoy the century-old streets in modern day style.

#### ABOUT THE AUTHOR

Jeff Eidsness is an Electrical Engineer and Office Manager of our Casper branch. He is a graduate of the University of Wyoming and has been with West Plains Engineering more than 20 years.



## Bringing Projects to Life with 3D Modeling

Kevin Groves, PE, Electrical Engineer | Power Division



When it comes to substation improvements, there is no easy “off” switch. Usually the substations we upgrade are still energized and supplying power to thousands of customers. While necessary, this can make data gathering a challenge. In order to minimize down-time, and maintain reliability to customers, most of our clients want to avoid de-energizing a substation until the construction phase begins. We understand, and agree. However, this approach can lead to prolonged design, or even change-orders during construction, if not handled properly early in the project.

We have encountered numerous substations where the installation of new equipment can create clearance and spacing issues. Many older substations are lacking the necessary drawings to determine structural capacities or clearances within the substation. We have even encountered a few substations that have none of the original design drawings available at all.

The good news is, we can work with this. Even faced with a fully energized substation and very little data, our engineers and drafting staff can use on-site surveying and data rich REVIT® 3D modeling software to digitally recreate the substation. That means design work can happen without putting customers in the dark.

### OUR PROCESS

Depending on the substation, we typically start by measuring all of the foundations and structural components that can be safely reached from the ground. Next, we measure all of the necessary elevations within the substation by using a total station and surveying the existing material. This practice of surveying the substation enables us to begin the 3D modeling process within the REVIT® software. Using this approach to recreate the substation in three dimensions has eliminated many conflicts later in the project. For example, by determining interphase spacing and potential blade opening conflicts, we have saved both time and frustration during construction, which would otherwise have led to change-orders and additional expense. It has also allowed us to search out the best equipment, with the dimensions necessary, to fit within the space limitations of the existing structure. At other times we have

used this information to modify the existing structure in order to accommodate the required equipment.

We have been able to solve all of these problems by digitally re-creating an existing facility in three dimensions so everyone involved can visualize the design before any equipment is ordered. We have even used the 3D images to explain the future design to board members, management and other affected parties before any funds are allocated.

The ability to visualize and design substations using 3D modeling ultimately means three things: better design, lower costs and less customer downtime. For us, it means the ability to solve problems and seek out the best solutions for our clients.

For more information about our Power Division or to see a Portfolio of our work, visit [westplainsengineering.com](http://westplainsengineering.com). To speak with an engineer, call (605) 348-7455.



### ABOUT THE AUTHOR

Kevin Groves, PE is an Electrical Engineer with more than 19 years of experience in utility engineering. Since joining West Plains in 2006, he has led our Power Division in the design and planning of distribution, transmission and substation facilities.



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## SHINE BROTHERS/TJN ENTERPRISES, INC.

### Arc Flash Analysis

Iowa | Minnesota | South Dakota



When your business is crushing, shearing and shredding scrap metal for recycling, naturally it takes considerable power. But with such power comes great risk for electrical hazards. In 2015, we worked with Shine Brothers/TJN Enterprises to conduct arc flash studies and analyses. Distributed across three states, they have 34 separate service entrances that needed to be modeled in the Easy Power software WPE uses for the calculations. Step one was to visit each site and collect the data and create 1-line diagrams with

assistance from local electricians. Once the models were built and the calculations completed, WPE installed over 250 Arc Flash Labels.

None of the sites had existing 1-line diagrams, so a huge benefit to the owner was an accurate electrical distribution system diagram. WPE will maintain these and update them for any client as changes are made. As data is collected, a detailed inventory is also created and can be provided to the owner in a spreadsheet for their use.

Learn more about Arc Flash Studies at [westplainsengineering.com](http://westplainsengineering.com)



**ABOUT THE AUTHOR**  
Todd Weidner, PE, RCDD is a principal electrical engineer and manager of the Electrical Specialties Division. Todd has been with West Plains for more than 15 years and is based out of our Sioux Falls, SD office.

## Rickert Adds Decades of Experience to Power Division

We are excited to welcome John Rickert to our Power Division. John has more than 25 years of experience in utility engineering, including the design of thousands of miles of 12 kV through 500 kV wood and steel pole transmission and distribution lines, underground and raceway projects and industrial refinery work. His resumé features extensive experience in the area of transmission line design through 500 kV, including line location surveying, structure and conductor design, bid document preparation, construction contract preparation, sag and tension analysis and field support engineering with emphasis on project management. Many of these functions included environmental adaptations and unique solutions for specific operational or construction related issues. He is also experienced in the use of line optimization software including Pole-Cadd™ and PLS-CADD™.



John is located in our Rapid City office and can be reached at (605) 348-7455 or [john.rickert@westplainsengineering.com](mailto:john.rickert@westplainsengineering.com)

## Heinrich Earns BEMP Certification

Michael S. Heinrich, PE, LEED AP, recently passed his examination to earn the ASHRAE-Certified Building Energy Modeling Professional (BEMP) designation. The exam identifies engineers who understand modeling principles and can accurately apply building energy quotient standards during the construction process.



Heinrich, who has been a Mechanical Engineer with West Plains Engineering, Inc. since 2001, demonstrated his ability to model new and existing buildings and systems with their full range of physics, ensuring energy-efficient outcomes. Also a LEED-AP professional by the U.S. Green Building Council, Heinrich has a dedication to energy conservation and smart design.

## West Plains Quick News

- We're pleased to welcome two summer interns to the West Plains Engineering team. **Rapid City:** Jeremiah Sutton, SD School of Mines & Technology. **Cedar Rapids:** Parker Kraus, Iowa State University
- Our Cedar Rapids office was proud to sponsor the 4th Annual Shoot from the Heart Sporting Clay Shoot to benefit the American Heart Association Heart Walk in April.