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Daren Beckloff, Senior Electrical Engineer | Power Division

Ĩ Q ROOSEVELT PUBLIC POWER DISTRICT

The way we create, distribute and use electricity continues to develop and change at an impressive pace. In turn, many utility services require upgrades to take advantage of these more efficient technologies.

Recently, our Power Division worked with Roosevelt Public Power District in Nebraska to modernize its Mitchell Substation.



Our engineers designed upgrades to equipment, system controls and facility infrastructure to make sure this important substation continued to reliably meet the needs of customers.

The conversion involved changing overhead "clothes-line" style bus to tubular aluminum bus, a new belowgrade spill containment system, three new single-phase voltage regulators with SCADA control,

specification for the purchase of a new 14 MVA 34.5/12.47kV transformer and four new triple-single feeder reclosers with Form 6 electronic controls. Other upgrades included new station LED lighting, ground grid improvements and new 48Vdc battery backup system.

The new SCADA system features remote monitoring and control of all transformer alarms, as well as intelligent electronic devices, radio telemetry and control house environmental upgrades. Finally, new concrete foundations were designed to support the larger transformer, regulators and static support steel poles.

ABOUT THE AUTHOR

Daren Beckloff, P.E. is a Senior Electrical Engineer in our Power Division. Daren has been with West Plains since 2006 and is based out of our Rapid City office. daren.beckloff@westplainsengineering.com



AN ENGINEERING SOLUTION CENTER

Designing a Smarter Classroom

Michael Heinrich, PE, Mechanical Engineer | Eric Fewson, PE, Electrical Engineer



New building construction accounts for only roughly | ELECTRICAL SYSTEMS two percent of the U.S. commercial building stock. With the average building lifespan currently well over 100

years – it's easy to see that the vast majority of buildings, including schools, will still be in use in 10, 15 or 20 years.

Armed with this knowledge, it's important for school boards and administrators to consider how their existing spaces perform and what designs they can consider to improve efficiency, reliability and cost.

MECHANICAL SYSTEMS

Michael Heinrich, P.E., LEED AP, BEMP

Imagine, in your own lifetime how things have changed. HVAC systems are not different. The typical lifespan of mechanical equipment, depending on the type, is just 15 to 30 years. Noticeably in recent years, electronic components in mechanical systems have become cheaper and more fully integrated. Variable frequency

drives (VFD's) are now a nobrainer on motors, with that old 15 horsepower fan or pump now normally using less than two horsepower of energy. In fact, an equal replacement air conditioner

The typical lifespan of mechanical equipment... is just 15 to 30 years.

for one purchased in 2001 would now use \$79 worth of electricity compared to the old one at \$100.

Other examples are found throughout any facility, whether it be motors, compressors, boilers - the list goes on. At some point, they will need to be replaced and it becomes simply a question of how. Using building energy audits, we identify ways to reduce energy use and clearly define the best replacement options for a building resulting in the best bang for the buck. School boards and administrators can make their decisions based on data knowing that their new system will serve their facility today and for decades to come.

Eric Fewson, P.E.

Think hard. Can you name a single system in a school that doesn't, to some degree, rely on electricity? A few maybe, but the reality of modern education is that chalkboards have been replaced by Smartboards and lunch money is online. Nearly every important system begins with the electrical distribution heating and cooling, fire alarms, lighting, computers, projectors and, of course, the staff room coffee pot.

Without an adequate electrical distribution system designed to the National Electric Code, every school is susceptible to sources of fire, overloaded circuit breakers and, at very least, disruptions to classes. In order to deliver the best learning environment possible for students and educators, schools must have an electrical system that meets the needs of their technology-driven world.

Believe it or not, lighting systems are a key component to the classroom experience. A well-lit, comfortable space makes it easier for teachers to teach and students to learn. Lighting and lighting control technologies have improved significantly in the last several years. LED fixtures have improved to the point where cost effective retrofits are feasible. There are also numerous grant programs (depending on state and electric utility provider) that provide funding for projects that save energy. In North Dakota, the Department of Commerce offers an Energy Conservation Grant. This program provides a 50 percent match toward energy savings projects that have a simple payback of 10 years or less. The grant application requires a qualified engineer to calculate and provide savings estimates. Recently, West Plains partnered with H.A. Thompson & Sons and Anamoose-Drake Elementary in central North Dakota on this grant – and our building modeling and calculations were key in helping the district apply for and receive the funds.

For more information on this and other Education projects, visit westplainsengineering.com.

ABOUT THE AUTHORS

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Eric Fewson, P.E., is an electrical engineer and Certified Energy Manager. He is the office manager of our Bismarck branch and has been with West Plains Engineering since 2014. eric.fewson@westplainsengineering.com



DELL RAPIDS MIDDLE & HIGH SCHOOLS

Addition & Remodel Dell Rapids, SD

It takes more than a classroom to educate students. In reality, spaces to support extracurricular activities like athletics, music and the arts are equally important to a well-rounded education. In 2011, West Plains Engineering teamed up with Architecture Incorporated out of Sioux Falls and the Dell Rapids School District for an addition to the community's middle and high schools. The 22,000 square foot space was to accommodate the art, industrial arts and band departments, as well as housing a gym, weight room, locker rooms and a wrestling room.

Bismarck Office Enjoys Warm Chamber Welcome



Office manager Eric Fewson, P.E. (left) and WPE President Doug Feterl, P.E. (right) cut the ribbon with the Bismarck-Mandan Chamber of Commerce.

Our Bismarck office received a very warm welcome from the Bismarck-Mandan business community on August 17 for our official ribbon cutting and open house.

The Bismarck-Mandan Chamber of Commerce ambassadors and staff helped do the honors, followed by an open house and networking social inside where some of our friends from JLG Architects, G&R Controls and the North Dakota National Guard (just to name a few) stopped by. Thank you to everyone who came out to wish us well. We look forward to working with you!

Each learning environment presented its own unique engineering features - from fluorescent high bay lighting in the sports areas to a welding exhaust and dust collection system in the shop. Our designs considered the needs of students and educators in each space down to the smallest details like programmable radiation in the wrestling room for optimal practice temperatures. The finished product was a success, and Dell Rapids school recently asked our engineers back for more work to the locker rooms. as well as administrative spaces and the addition of three science classrooms. The result is a facility that will support the success of Dell Rapids students in all areas of learning for decades to come.

ABOUT THE AUTHOR Darlene Weber has been an electrical design engineer with West Plains Engineering for 13 years. She is based out of our Sioux Falls office. darlene.weber@ westplainsengineering.com

Sioux Falls Office Brings Sustainability to Life

Our Sioux Falls office is bringing sustainability to life - quite literally. For the second consecutive year, the staff have rolled up their sleeves to join the urban gardening trend with their own office plots. The space is divided into sections with each employee cultivating his or her own produce. The bounty however typically shared.



Welcome Chris Haman!



We're pleased to welcome Chris Haman to our Cedar Rapids office. Chris is an electrical engineer and graduate of Iowa State University. He will work directly with office manager and electrical engineering project manager, Jeff Reinhart, P.E., as well as the Cedar Rapids mechanical engineering staff, in developing solutions in Iowa.