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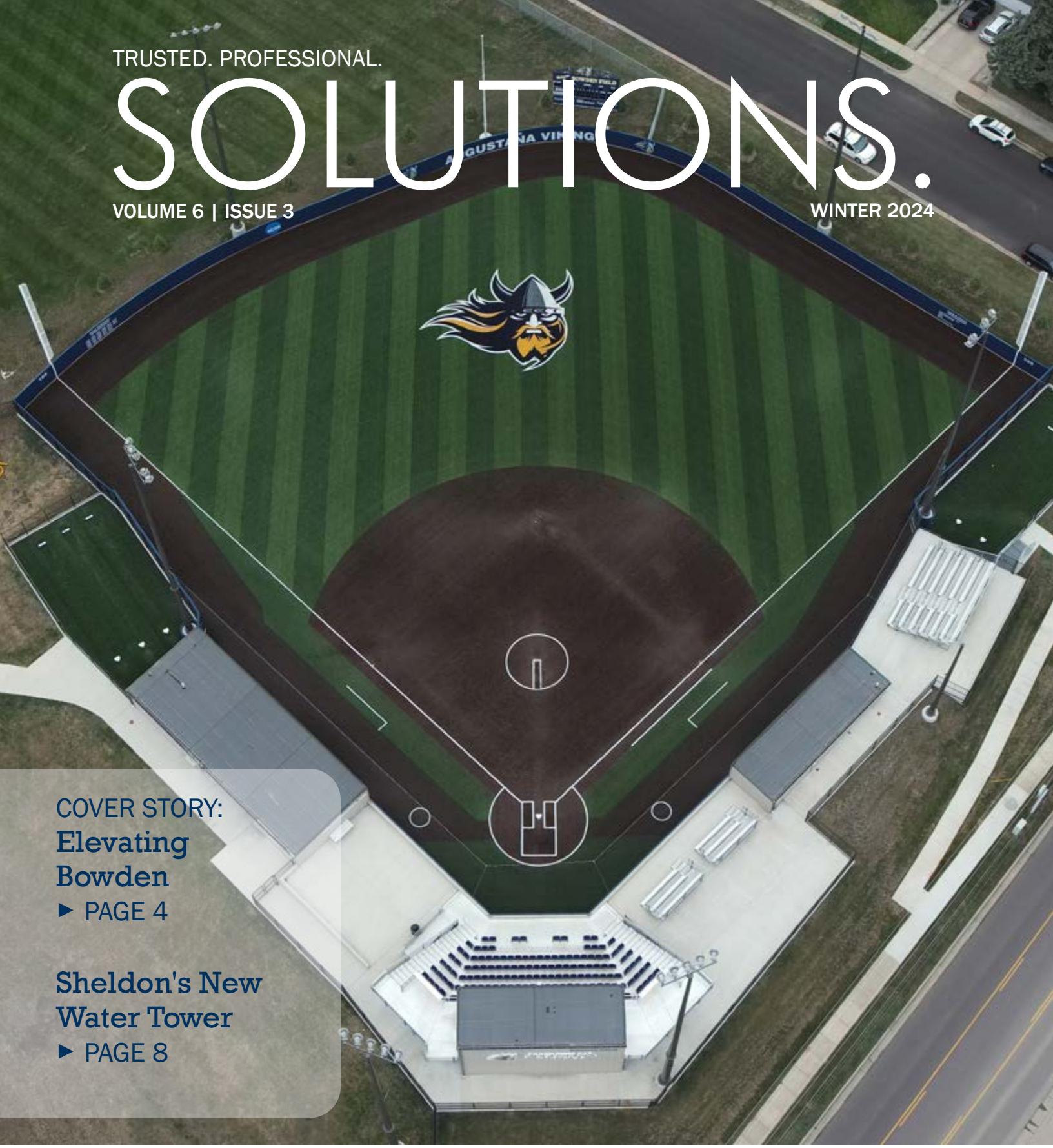
WINTER 2024



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Varied Challenges Call for Solutions

Happy New Year! All of us at DGR Engineering look forward to 2024 with great anticipation, as we continue to work as trusted advisors to our valued clients, providing solutions to the challenges that they face.

As we close out the year 2023, the more than 175 professionals that make up DGR Engineering look back on a year filled with a large range of projects across all of the disciplines and departments that make up our company. As I reflect on those projects, some of them are what could be termed as “high visibility”, while others would hardly be noticed but yet would have a big impact on the lives of those they touch. This issue of *Solutions* nicely covers projects in both categories.

In the category of high visibility, our work in providing a championship-level ballpark for the Augustana University (AU) softball program has resulted in a facility that has elevated the experience for both players and fans who attend games there. The upgraded Bowden Field complex on AU’s campus in Sioux Falls allows the successful softball program to showcase itself in a beautiful location that will serve for many years, and will be noticed by all who attend games there.

Also high visibility, but for a different reason, is the new water tower in Sheldon, Iowa. Located in the southeast part of the community, standing over 120 feet tall, and emblazoned with a unique design, it is hard to miss when driving through the Sheldon area. The article included in this newsletter does a nice job of explaining the planning and construction process for this tank, along with the less visible water mains that leverage the new tank’s ability to solve a number of challenges that previously existed in the City of Sheldon’s water system.

The third project featured in this issue is one that would likely be overlooked by nearly everyone who wasn’t already aware of the project, but that has significantly improved the lives of those who live adjacent to it. The project describes a relatively-short drainage channel in Sioux Falls that, over a number of years, was upgraded so that high-rainfall events no longer cause flooding to adjacent properties.

Finally, this newsletter shows off some of the exciting personnel-related aspects of our firm, including some service awards that were conveyed during a recent company event, several new employees who have been added to our firm, and recognition of some individuals who have become licensed as Professional Engineers.

Thanks to all who follow and are interested in DGR Engineering.
All of us wish all of you a blessed 2024! ■

By Blair Metzger, PE
President

Elevating Bowden Field

to a Championship Experience

By Dan Van Schepen, PE
Project Manager

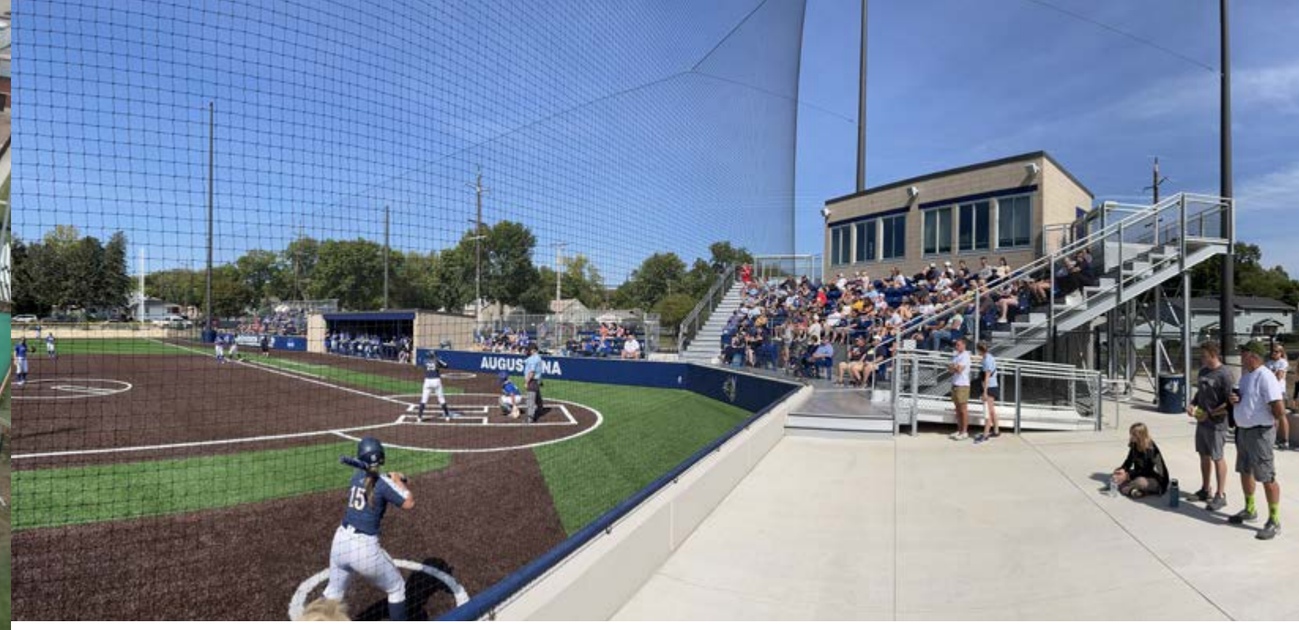
The Augustana University softball program has a long history of performing at a high level. (Including two national championships, six World Series appearances and 28 NCAA Regional appearances). Project planning by Augustana University and DGR Engineering (DGR) to upgrade Bowden Field to a championship level began in 2018, and eventually culminated in a new facility which opened for the 2023 season.

> The final project plan balances project features with the funding utilizing bid alternates for several project features

Unique Project Challenges

A variety of unique challenges presented themselves. The biggest challenge: fitting a new modern facility within the existing field's footprint (circa 1991). To achieve this, home plate was shifted approximately 12 feet south to maintain existing fencing dimensions and provide room for chair back seating and a fan suite/ press box behind home plate.

Also, an extended planning process was necessary to balance donation momentum with Augustana University's facility expectations for a championship-level facility.



Extensive project coordination was needed to arrange work tasks among the architect, engineer, general contractor, field contractor, netting contractor and lighting contractor.

Project Approach

The project approach included detailed preliminary project scope effort with Augustana University staff and coaches, the project architect, Architecture Inc. and DGR to design a championship facility while reflecting a budget based on fundraising momentum.

The final project plan balanced design goals with the funding while utilizing bid alternates for several features to allow the University flexibility in decision-making in the following areas:

- Lighting
- Outfield padding
- Dugout Cabinets
- Chairback seating - Potential future addition space
- Press box lift
- Home team dugout kitchenette

The final result is a state-of-the-art facility that all parties can be proud of and that will serve the needs of Augustana University's softball team and its fans for many years. ■

Project Owner:
Augustana University

Architect: Architecture Inc.

General Contractor:
Beck and Hofer Construction

Field Contractor:
Mammoth Construction

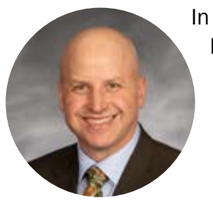
Key Experiences:

- ► Providing accessible path across a City storm water overflow area
- ► Meeting City detention requirements within the turf field drainage retention design
- ► Providing space for an enhanced player and fan experience within the old field footprint
- ► Coordinating between multiple Contracting entities during construction

Key Features:

- ► Air conditioned press box and fan suite
- ► Heated dugouts
- ► Dugout bathrooms
- ► ADA accessible facility
- ► Padded fencing
- ► Field lighting for night games
- ► Foul ball netting for improved sight lines and fan experience
- ► Ticketing booth
- ► Full facility security fencing

BIG TROUBLE in Little Channel



By Lance Mayer, PE
Project Engineer

In March of 2014, the City of Sioux Falls requested DGR Engineering's (DGR) services for improvements to a small drainage channel near Riverdale Road from 24th Street to 26th Street. The channel was undersized, and some adjacent properties and structures had previously sustained flood damage during large rain events.

During initial design, DGR sent out comment cards to property owners to gather input regarding the condition of the channel, along with their issues and concerns. From the responses, it was determined that the channel did not have the capacity needed, especially during the spring snow melt when the channel was full of ice and snow. In addition, the channel was extremely overgrown with weeds and trees, and there was an old fence on the west side of the channel, all of which impeded the natural flow.

To begin the process of improving the channel, DGR performed a hydraulic model to determine the maximum flow within the drainage basin. The model compiled information about the channel and helped determine when overtopping occurs. Based on the analysis, the City elected to construct a new channel in lieu of repairing the existing one.

DGR's next step was going door to door to meet individually with all property owners adjacent to the channel. The owners were informed that the proposed project would remove existing trees, vegetation, fence, etc., within the drainage easement and along the east side of the railroad tracks; replace the existing concrete channel with a new rectangular six-foot wide concrete channel; and would add crushed rock adjacent to the

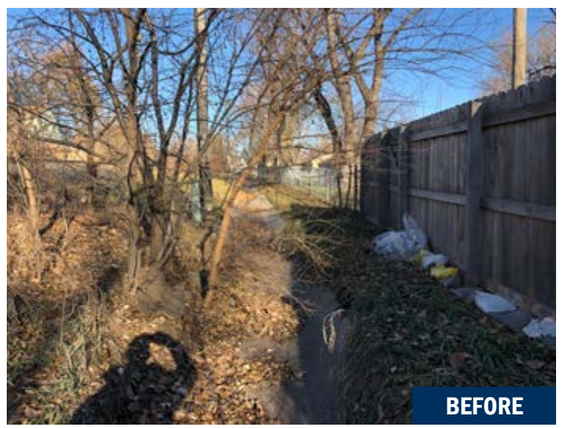
railroad tracks to replace the vegetation in that area. Upon completion of the work, disturbed areas on the east side of the channel would be re-vegetated. Property owners were excited to hear this project was happening, as the area had not been regularly maintained and previous flooding had occurred.

The project was advertised for bids in late June of 2014; however, due to unforeseen circumstances, the City of Sioux Falls had to postpone the bidding. DGR informed prospective bidders that any bids received would remain sealed and had to inform property owners that this project was not going to be constructed as anticipated that year. DGR advised property owners that the City would rebid this project as soon as it could be reprogrammed in the City's Capital Improvements Plan, which was expected to occur in 2015 or 2016.

In February of 2015, the City requested DGR notify property owners that construction would not take place in 2015, and that the City would review scheduling the project later that year to determine when they would be able to reprogram it into their Capital Improvement Plan.

A little over four years passed, and in August 2019, the City once again reached out to DGR to notify the property owners that they were putting this project in their 2020 construction schedule. The City asked DGR to redesign the channel to increase the size to get as much capacity as possible in the limited 10-foot easement. The ultimate goal was to minimize flooding impact to the greatest extent possible. Timing was such that the property owners were once again affected by flood events that had occurred earlier in 2019.

Expanding the project and designing the channel to handle more capacity required making the channel deeper and wider. ▶ Continued on Page 10



YEARS OF PREPARATION LAY THE GROUNDWORK

More Water for Sheldon

By Logan Smidt, PE
Project Manager

DGR Engineering (DGR) began working in 2015 with the City of Sheldon on a comprehensive study of the Sheldon's drinking water system. The first phase of the study was to develop a computerized hydraulic model of the drinking water supply system, including pumping facilities, water storage structures, and the network of underground pipelines. The goal of the first phase was to identify the condition of the underground pipelines.

A second phase of the comprehensive study was undertaken to review the adequacy of water storage by utilizing the newly developed hydraulic model. The study found that the City would soon be in need of additional volume of stored water to meet the regulatory requirement for fire protection. With the hydraulic model now built, DGR was able to easily simulate different designs and graphically interpret how the performance of the water supply system changed with the addition of a second water tower. It was determined that a new water tower, located in the southeast corner of the City, along with a looped pipeline, would meet the volume requirement and more. Not only would the water tower help to meet the volume requirement, but the looped pipeline would increase fire flow capacity and provide hydraulic balance. An equalized hydraulic balance allows the water level in the two towers to "float" together so that the full volume of both towers can be used, rather than having one tower overflowing when the other is not yet full.

> The water tower serves as both a critical piece of Sheldon's drinking water infrastructure and a welcome beacon for the City.

It was the City's desire to proceed with construction, however, due to funding limitations and the City having to pursue other projects, the project was put on hold. Fast forward to 2022, and the project was brought back to the forefront. Prior preliminary design work put the project in a position to move quickly to the final design phase, and the push for final design began in the spring. Bidding and contractor selection were completed by late summer, and the contractor broke ground in November 2022.

The water tower is 121-6" tall, pedestal design and holds 500,000 gallons of water. That's equivalent to 4,000,000 bottles of water or 8,000,000 cups of coffee!

The mural on the bowl of the tank includes an agricultural scene and recreational activities that are relevant in the Sheldon community (family, combine, dog, trails, bikes).

Hulstein Excavating was awarded a contract to construct the pipeline, and Maguire Iron was awarded the contract to construct the water tower. Hulstein completed its portion in only a little over a month's time, starting in November and finishing by mid-December. Maguire Iron broke ground on the water tower in November, completing the foundation for the water tower by the end of 2022, and setting the stage for the tower to be erected in 2023.

The water tower is lighted in accordance with FAA Standards because of its proximity to the Sheldon airport.

Work didn't stop in the winter months, as steel was purchased, rolled, fabricated, and primed in the Maguire Iron shop. Erection of the tower was complete by August of 2023, allowing enough time for the field painting work to take place before cold weather set in. Painting is now complete, and the water tower serves as both a critical piece of Sheldon's drinking water infrastructure and as a welcome beacon for the City. ■

Unique Challenges

- **The location and operation of a water tower** play a big factor in how often the water is "turned over". The looped pipeline leading to the water tower made water age a concern for this project. To solve this, DGR conducted an extended period simulation to estimate water age and ultimately recommended that the City manage water age by allowing the water level in the towers to fall farther before being refilled.
- **The water tower location** chosen lies directly in line with the flight path of the Sheldon Regional Airport runway. DGR's aviation department helped navigate through the Federal Aviation Administration's Obstruction Evaluation process, and ultimately receive a determination that the structure would not have an adverse affect on airspace safety, provided the water tower was constructed with a flashing beacon.

Solutions

- **Long range planning** from the mid 2000's anticipated growth to the east of Sheldon with the plan for completion of the Highway 60 bypass. Simultaneous to the construction of the bypass, DGR assisted the City with design and construction of a 12" pipeline to the east side of the community. The new water tower located in the southeast corner of the City will improve water service as the city continues to grow and develop along the Highway 60 corridor.
- **A second water tower** provides elevated storage redundancy. Maintenance to either of the water towers, such as repainting, can be accomplished without significant changes to operations. The new controls allow pumps at the water treatment plant to start based on the water level in either of the water towers.

  Prior to having the second water tower, if maintenance on the sole water tower was needed, pumps had to run non-stop to maintain water pressure in the community, and pressure relief valves were placed around the City to ensure that the pipeline network was not over-pressurized.

Big Trouble

► Continued from Page 7

Doing this created conflicts with existing utility poles that were encroaching in the easement and therefore needed to be relocated. Those challenges, along with Burlington Northern Santa Fe (BNSF) Railroad's permitting obstacles, added another two years of coordination. In mid-summer 2022, the City was finally given permission to construct the channel.

Due to the late season start, the contractor was unable to finish the drainage channel in the fall of 2022 and came back during the late spring of 2023 to complete the remaining landscaping and fence replacement. The patience of all parties was tested throughout this process; however, after almost ten years of coordination, design, and construction, this drainage channel project was finally completed in the summer of 2023. The contractor and subcontractors did an amazing job revitalizing an area that had been neglected and overgrown, and the property owners along Riverdale Road are now better protected against future flooding. ■

2023 DGR ENGINEERING SERVICE AWARDS

Congratulations to this year's DGR Engineering service award winners, who were honored at our fall gathering on October 21. Three 30-year service award recipients were recognized: **Gary Kurth** is a Project Manager and Department Head for the Rock Rapids Civil/Survey Department; **Marlin Overman** is Vice President-CFO and works in the Rock Rapids office; and **Sandy Wessels** is a technician for the Rock Rapids Electrical Power Department.

One 20-year service award recipient was also honored. **Patrick Deering** is a Project Manager in the Rock Rapids Water Services Department.

Other service award honorees include: **15-Year Awards:** Luke Grigg, Matt Kopp, Paul Messner, Chris Nordquist and Ryan Norman. **10-year Awards**: Nathan Brandenburg, Ryan Kleinjan, Matt Knips, Kevin Puhl, Alex Richter and Joshua Vanderwerf.

Gary Kurth

Marlin Overman

Sandy Wessels

Patrick Deering

5-year Awards: Brady Grafing, Krystal Hermanson, Lucas Larson, Craig Lauritzen, Derek Lee, Robert Legare, Michael Lundy, Andrew Nielson, Kevin Ranney, Matt Schar and Travis Zipf.

EARN P.E. LICENSES

Dylan Schueler, PE
Engineer
Electrical Power
Rock Rapids, IA Office

Brenton Thompson, PE
Engineer
Electrical Power
Rock Rapids, IA Office

NEW EMPLOYEES

Amber Ackerman
Business Support
Rock Rapids, IA Office

Heather Freese
Technician
Water Services
Rock Rapids, IA Office

Brian Metzger
Technician
Electrical Power
Rock Rapids, IA Office

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What Is It?

DO YOU KNOW WHAT THIS IS?

It's a bird flight diverter. Diverters are installed on overhead powerlines, typically around waterfowl areas, to increase the visibility of the wire and reduce the likelihood of birds flying into the wires.