ACEC

American Council of Engineering Companies
of North Dakota

The North Dakota Engineer

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Table of Contents

Articles & Awards

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From The President

By Eric J. Michel, PE

Welcome Readers!

On behalf of the executive committee, our members, and the staff here at ACEC-ND, I am proud to introduce the first edition of the North Dakota Engineer magazine.

We are solutions providers first. This inaugural edition showcases just a sample of the work we do for our clients in the great state of North Dakota. Each member firm has the annual opportunity to submit projects that demonstrate what they do to add value to the clients we serve and the communities we impact.

We hope this magazine also serves as a repository for those seeking professional services. We strongly encourage all engineering companies licensed to do business in the state to actively participate, and we believe you'll find a trusted advisor in the pages to follow.

We take tremendous pride in our vocation as engineers. We focus on public safety and economic and sustainable solutions while maintaining form and function. Ask an engineer about a favorite project or even what they are currently working on and be prepared for the room to be lit up with purpose from an unlikely story teller. Inside are just a few of those stories.

Finally, I'd like to thank you for reading this magazine and gaining some familiarity with what we do and what we can do together. I encourage you to keep it available as a reference to match up registered engineering business partners with your future needs.

From The Executive Office

By Bonnie Staiger, Hon. AIA

As I look through the remarkable projects featured in this our inaugural issue, I can't help think about the committed members—the people--of this organization who made these projects happen. For all the technology, steel, mortar, asphalt and concrete in these pages, these design elements begin in the minds of talented individuals and teams. Our member firms are the best in the business--dedicated to both the profession and the clients they serve.

This is today. But in the future, who will be creating the engineering projects and serving you—the private owners, agencies, and political subdivisions in North Dakota and the region? Who will be those talented professional project managers and technical experts? Whoa . . . stop right there! These are not rhetorical questions. Turns out, the pursuit of answers has taken some serious unpacking and led to deeper questions and inquiry.

A big step happened five years ago. ACEC|ND's Executive Committee recognized the need to better equip the next generation with desired skills to guide the firms and competencies critical to their success. In a leap of faith and determination, the Emerging Leadership Institute (ELI) was launched, a curriculum was developed, participants were selected, and nationally recognized leaders in each core element were invited to present that topic. Fast forward and we can boast our first ELI graduating class has moved onward to test what they've learned and the next 2 classes will graduate this fall.

Meanwhile, over the past year, ACEC|ND also began to explore another area of concern: a prequel of sorts to the ELI program. We began an inquiry into the pipeline of new professionals entering the engineering fields. We quickly found we needed to look beyond our two 4-year engineering programs at NDSU and UND to learn who enrolls in both degree and technical programs. When does she or he make that career decision, and what influences that decision.

Armed with an ever-changing knowledge base, ACEC will develop strategies that continue to support our emerging professionals plus direct additional resources for emerging students. These projects help shape current and future needs of our members and you, the owners, agencies, and political subdivisions who have come to depend on our engineers being the best we can be. Yes, together!

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Collaboration Equals Success

By Russ Hanson – Executive Vice President,
Associated General Contractors of North Dakota

Thanks for the opportunity to participate in this inaugural publication. The AGC of North Dakota wishes ACECND much success with this edition of this publication and for those in future years.

There is an old adage which consistently rings true to me and it's "one cannot do it all alone." That is especially true when I reflect upon the collaborative efforts of the AGC of ND and ACECND during the 12 years of my tenure at AGC of ND. And when I do reflect, there's a huge sense of pride in the success our groups have had with our collaborative legislative efforts. While the specific duties of our respective professions are inherently different, they are both critical elements to the overall process. Each brings a unique perspective, and when melded together, contributes to a comprehensive industry perspective to the legislators/regulators on a regular basis. One of the common threads we have when speaking with ACECND representatives is the more we work together, the more we realize we are more alike than we are different. We both seek sound legislative/regulatory policy which benefits not only our membership but also the health and welfare of the public.

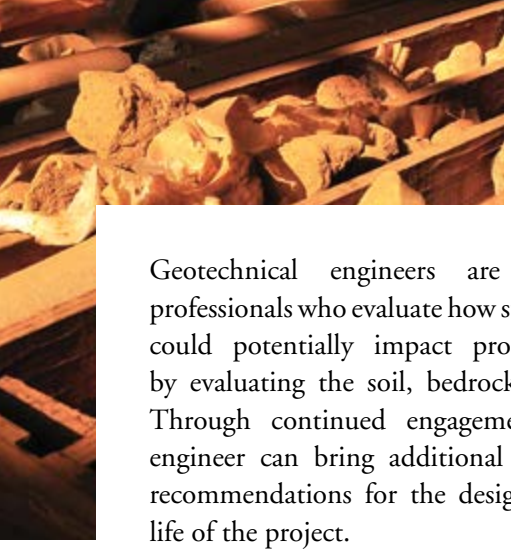
Since 2005, we have worked collectively on all issues including rewriting North Dakota Century Code Chapter 48. It was a complete revision of the public improvement statute which also added a new delivery method. It passed the 2007 Legislature after 18 months of exhausting industry coalition work without a single dissenting vote. Jerry Backes of Bartlett & West was ACECND's coalition representative and he provided key contributions to this effort. To illustrate this success, this chapter of the code hasn't been amended in any major way since.

For many years (and legislative sessions) we have collaborated consistently and successfully on proposed new delivery methods, public bid thresholds for both design/construction facets of the procurement process, and a countless number of other legislative issues which affect the two associations. With every collaborative effort, I learn something new or a perspective I would not have if not for the conversations with the design professionals.

As we look to the future, it appears many of the issues we've seemingly always addressed will remain. However, I foresee indemnification as a key issue for important industry discussion. It is a complicated issue, but one that both of our groups have on our radars.

As I pen this article, the 2017 Legislature is at its mid-session "Crossover Recess." There's hardly a day that goes by without at least a passing conversation with one of your volunteer leadership or ACECND representatives. Speaking of them, you should be very proud of the professionalism and effectiveness Bonnie Staiger, Stacy Krumwiede, and Mike Krumwiede provide ACECND on a daily basis. They are top notch and first class.

Again, congratulations on the first edition of this publication. The AGC of North Dakota looks forward to our continued efforts with ACECND.



Leveraging the Value of Geotechnical Engineering

By Wes Dickut, PE, Braun Intertec

Geotechnical engineers are civil engineering professionals who evaluate how subsurface conditions could potentially impact proposed development by evaluating the soil, bedrock, and groundwater. Through continued engagement, a geotechnical engineer can bring additional value by providing recommendations for the designer throughout the life of the project.

Soil characteristics will influence the development of a construction project. A geotechnical evaluation should be part of the site assessment to reduce potential unidentified site conditions. A geotechnical evaluation is an investigation process and is frequently one of the first documents prepared for a project. The information gathered includes the footprint of the building, proposed construction elevations, proposed grade changes at the site, configuration of parking and drives, and any unusual design conditions that must be considered. This information is then used to prepare an exploration plan with appropriate depths and locations. In order to effectively evaluate all the potential pitfalls, explorations could identify unfavorable conditions that may require a design modification, or they may confirm the relatively good conditions assumed.

Three phases where geotechnical engineering services add value to the design process:

1. **Engage a geotechnical engineer early to evaluate the proposed construction and assist in the scope preparation.** Conduct a review of the proposed design elements in order to gain a general idea of the site requirements. Obtain a quality geotechnical evaluation since this can save a project considerable time and expense by providing the design team and contractors with subsurface information and design parameters during the initial design and planning stages.
2. **Include the geotechnical engineer during design development and send a copy of the design to them.** Since many changes can happen during this stage, it is critical that changes are communicated with the geotechnical engineer who initially prepared the evaluation so they can determine if any alterations need to be made to the design. If a change is discovered during construction, an expensive and time consuming solution can be implemented to keep the project moving, but it is rarely efficient. It is true that additional evaluations will require additional time and fees, but the potential cost savings during construction by using appropriate recommendations are likely to offset these costs.
3. **Keep the geotechnical engineer engaged during the construction process.** By keeping them engaged during the construction process, they can observe both excavations and earthwork. Since very little material is actually observed during the exploration phase, the subsurface conditions can be more readily evaluated once the ground is broken and exposed. By keeping the same team engaged throughout the project, this can also help prevent unfortunate oversights.

One challenge with a geotechnical evaluation is that few are aware of all the necessary steps when initially approached to provide a proposal. Typically, a request for a proposal will contain a list of design parameters along with specific boring locations that need to be drilled to a specified depth. Too often geotechnical assumptions are required to be made, and the proposal is generally evaluated predominately on price and schedule. Because of the need for an "apples-to-apples" comparison between submitted proposals, it rarely will include an alternate scope such as a phased approach, additional and/or deeper soil borings, or a different exploration strategy. Alternate scopes are usually not considered since it could provide a competitive advantage of one firm over another.

It would be unthinkable to change the architect or structural engineer at the time of construction, so why replace the geotechnical engineer during this critical time? By keeping the same design team, changes and appropriate recommendations can easily be made during design development. They can also conduct observations during construction to confirm that the conditions are consistent. Leveraging the same geotechnical engineer throughout the duration of a project can bring additional value to the quality and final costs of the project.

Human Skills May Be The Most Vital Engineering Tool

By Gregory Wald, Communications Manager, Moore Engineering, Inc.

Planning, technical details, drawings, raw materials – all are vital to an engineering project's success. The human element, though, is more often what delivers a successful project.

Why? Because an engineering project often involves a multitude of stakeholders with diverse interests and concerns. For one landowner, an engineering solution to annual flooding might be a welcome relief. For another landowner, that same solution might bring unwelcome effects.

An engineer's value is often finding the sweet spot where the solution for the identified problem is acceptable to all. This requires continual communication and understanding, and it all starts with listening.

Building a Dam

The Upper Maple River Dam (UMRD) in Steele County is a great example. It's a unique and significant accomplishment in the water resources engineering world – and not just because of the technical details or the amount of material used to form this 5,000-foot earthen dam. The technical aspect is a story in itself.

The dam's truly remarkable story is the cooperation achieved between people who brought different – and sometimes conflicting – priorities to the table. Through communication, compromise and consensus building, in the end, they said "yes" to a structure that will reduce flood risk to over 22,000 acres of productive cropland and roadways.

Many stakeholders – landowners, cross-jurisdictional elected officials from counties, regulatory agencies and others – worked in the spirit of cooperation to approve and build something that benefits three townships.

It took meetings, trust building, time, patience, negotiation, more time and more meetings to see it through. An engineer led that process, using human skills like empathy, listening and understanding, in addition to technical skills like water modeling, CADD drawings and dam design.

Bridging Two Cities

When 40th Avenue South in Fargo and West Fargo, North Dakota, needed to be reconstructed, again it was human skills leading the way to a successful completion.

The rural two-lane roadway became a major urban thoroughfare when both cities grew exponentially and expanded their footprints. Elected officials and public works employees from both cities knew they had to add capacity and safety features for 40th Avenue to function as the urban arterial transportation route laid out in planning documents.

Planners knew, though, that homeowners, businesses, a school district and nonprofits were also along for the ride. Engineering decisions made to improve the street would dramatically affect them – financially, aesthetically and logistically during construction.

Again, the engineer was the common bond between all parties, guiding the design, planning, public input and education processes, as well as balancing the sometimes conflicting priorities.

People Projects

Engineering projects are not just technical exercises. In the end, they are all people projects, intended to improve the human condition and remove an obstacle to progress.

Engineers are trained to solve problems. The great ones put those skills to work not just in the physical world of concrete, pipes and plans, but in the human world of communication, emotions and vision.

America's only engineer president, Herbert Hoover, said it well: "Engineering is a great profession. There is the satisfaction of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal or energy. Then it brings homes to men or women. Then it elevates the standard of living and adds to the comforts of life. This is the engineer's high privilege."

A high privilege, indeed, enabled by the ability to identify interests, seek solutions and find common ground through listening, communication and compromise.

ACEC North Dakota Engineering Excellence Awards

The American Council of Engineering Companies (ACEC) of North Dakota's annual Engineering Excellence Awards (EEA) competition recognizes engineering firms for projects that demonstrate an exceptional degree of innovation, complexity, achievement, and value.

EEA entries are accepted into one of 12 project categories which follow the ACEC National awards program guidelines including: Studies, Research and Consulting Engineering Services; Building/Technology Systems; Structural Systems; Surveying and Mapping Technology; Environmental; Waste and Storm Water; Water Resources; Transportation; Special Projects; Small Projects; Energy; and Industrial and Manufacturing Processes and Facilities. Firms submitting at the state level have the option to submit at the ACEC National level.

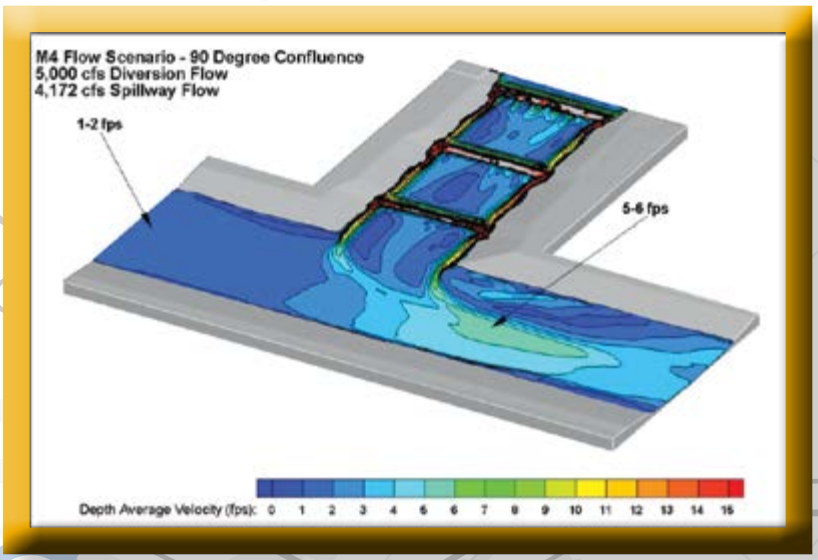
The jury scored projects on the following rating guidelines: uniqueness and/or innovative application of new or existing techniques; future value to the engineering profession and perception by the public; social, economic, and sustainable development considerations; complexity; and successful fulfillment of client and owner's needs, including schedule and budget.

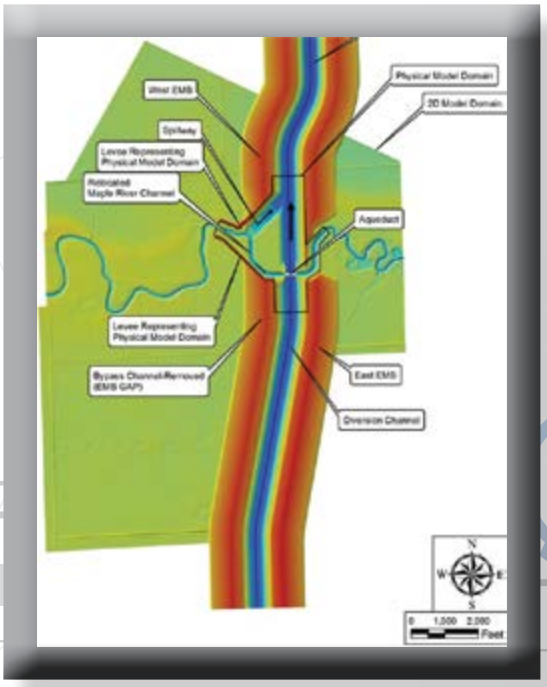
This year's awards jury was comprised of Lon Drevecky, Roger Fenstad, Gerry Floden, and Francis Ziegler. Their thoughtful and deliberate consideration of the exemplary submissions is appreciated.

Thank you to all the firms who submitted projects this year. The submissions represented a diverse group of excellent projects. On behalf of ACEC North Dakota and this year's awards jury, we would like to congratulate you!

Category A: Studies, Research and Consulting

Winning Firm: HDR Engineering





Project Name:

Fargo-Moorhead Maple River Aqueduct Modeling, Fargo, ND

As part of the Fargo-Moorhead (FM) Area Flood Risk Management Project, an aqueduct was proposed to carry flow and maintain aquatic and hydraulic connectivity in the Maple River as it crosses over the diversion channel. The configuration includes a spillway with a control weir located on the Maple River a short distance upstream from the proposed aqueduct. The spillway control weir diverts high flows from the river into the diversion channel reducing flow in the Maple River channel. The Maple and Sheyenne River aqueducts will be the first aqueducts constructed in North Dakota and are likely the first aqueducts in the United States constructed for the intended purpose of providing aquatic and hydraulic connectivity.

The aqueducts will provide fish passage and maintain the channel wetlands on the protected side of the FM Diversion channel, while also controlling the amount of flow entering the protected area during a flood event. A physical model and three numeric hydraulic models were used to model the Maple River Aqueduct. Results were used to inform and validate the models and provide recommendations on the following: hydraulic geometric requirements, hydraulic locations requirements, structure type definition, the suggested configuration and placement for the ice control structures, project features related to erosion protection, sediment control features, and fish passage features. Additionally, the results will be used to inform the design of the Sheyenne River Aqueduct.

The FM metro area experiences a regular threat of catastrophic flooding. These aqueducts represent a significant piece of the FM Diversion project, which significantly reduces the regular threat of catastrophic flooding of the Fargo-Moorhead metro area and maintains the fish passage and channel wetlands on the protected side of the Diversion Channel.

Jury Comments

The Fargo Moorhead Area Flood Risk Management Project diversion channel crosses the Maple and Sheyenne Rivers. The diversion will require aqueducts to carry normal river flow to provide fish passage and maintain the channel wetlands on the protected side of the diversion channel while diverting high flows into the diversion channel. A physical model and three numeric hydraulic models were used to model the Maple River Aqueduct with the results also used to inform the design of the Sheyenne River Aqueduct. The design team worked with the US Corps of Engineers to investigate the performance of the aqueduct crossing, verify assumptions made during the feasibility design, refine the final design and layout, and assess the potential ice problems associated with the structure. These aqueducts represent a significant piece of the FM Diversion Project and are likely the first to be built in the United States for the purpose of providing aquatic and hydraulic connectivity.

Category C: Structural Systems

Winning Firm: KLJ

Project Name:

4 Bears Event Center Addition, New Town, ND

4 Bears Casino and Lodge is one of the most well-known event venues in the state with more than 220 rooms and a 33,000-square foot event center. Due to the region's recent rise in population, the casino wanted to add larger events to their roster in order to gain more revenue. Their existing capacity of 2,000 prevented them from booking larger events. 4 Bears Casino and Lodge hired KLJ to renovate the event center and design a new event center.

KLJ utilized a multi-phase, Construction Manager At Risk (CMAR) delivery method to expedite the project schedule and maintain the owner's fixed budget. This allowed the owner to continue operations throughout construction and minimize revenue losses for the casino and surrounding community. During phase one, KLJ developed design plans for the renovation of the existing event center which included a 2,500 square foot slot room with an advanced ventilation system for smoking patrons. Phase two consisted of the new event center addition which includes two main levels and houses a majority of the concert seating and stage area.

Structural design included structural steel framing with open-web and structural steel joist systems, concrete floor over steel deck in the renovated arena and a pre-cast hollow-core floor system for the new event center framing. Precast beams allowed for construction of a tiered seating area on the upper level. The roofing consisted of steel roof deck over open-web steel joists. The main event center roof was constructed with 200-foot-long span trusses spanning the floor of the arena.

The completed project includes a renovated event center and an additional event center that doubles the casino's event capacity. The additional capacity, new rigging system and various updates will aid 4 Bears Casino and Lodge in booking larger events, making it the ultimate destination for regional events.

Jury Comments

KLJ was commissioned in 2014 to design a two-phase project to renovate the existing events center and design a new events center with double the seating. The new events center was 96,000 SF in size, seats 4,000 and features 18 box suites placed on tiered levels on the 28,500 SF upper level. The project was completed using the Construction Manager at Risk (CMAR) delivery method. Project challenges included accelerated design and construction, Long span truss requirement that was flexible to accommodate diverse rigging loads, complex lateral multi-level floor and roof system, lack of information on existing structural systems, confined construction space and need to maintain casino operations with minimum loss of revenue. Several software technologies including RIVET, RISA3D and RISAFloor were utilized to create the building plans in a manner to minimize construction phase problems and maintain an aggressive schedule. One of the structural design solutions was to prefabricate the 200 ft. long, 41,000-pound, steel trusses in two sections and assemble them on site during erection.

Category F: Water and Wastewater

Winning Firm: Apex Engineering Group

Inside the station: pumps, header and gauges

Control panel, set points

Temporary storage tank and forcemain set up near 116th Avenue SW and Highway 10, by MBI, an oil service company, for a one-time purchase of reuse water from the City of Dickinson. They then pumped the reuse water from the tank approximately 15 miles to their job site.

Project Name:

Dickinson Reuse Booster Station, Dickinson, ND

The City of Dickinson has experienced recent, extensive growth due to oil production in the surrounding Bakken Formation. The City realized it couldn't support the community with the existing infrastructure and with assistance from Apex, updated the infrastructure by expanding their wastewater systems to better serve residents and provide for future growth.

The Water Reclamation Facility (WRF) was designed to treat wastewater to a level of quality that could be discharged or sold for irrigation and industrial purposes. This generates revenue, and conserves the potable water supply. The design and construction of the Dickinson Reuse Booster Station was the first step in creating an area-wide reuse water distribution system. It offers access to a sustainable water supply for industrial uses while easing demands on the potable water supply. This system provides a secure water source allowing new industries to come to Dickinson. The station is capable of pumping 150 to 2,100 gallons per minute, and can be expanded. This solution is beneficial as industries have access to the quality and quantity of water needed for production and the City is able to recycle waste while generating revenue. Sales to date have paid for all construction costs.

Dickinson's system is planned to be the largest, area-wide reuse water system in North Dakota. The station was designed to operate under a wide variety of demands and conditions, allowing it to adapt as demands fluctuate. The distribution system will continue to grow, allowing for storage facilities, fill stations, and even individual service connections. Reuse water may be used for watering parks and golf courses, dust control at construction sites, and a multitude of industrial and agricultural uses.

Apex and the City agree that the completion of the Dickinson Reuse Booster is a job well done, both environmentally and economically.

Jury Comments

The Dickinson Reuse Booster Station and distribution system, as it was designed, is unique to the state of North Dakota. While some cities supply reuse water to one or two industries, this is an area-wide solution to a shortage of available water supplies. Southwestern North Dakota, where the City of Dickinson is located, has very limited water resources. Industries in southwestern North Dakota find it very difficult to obtain a guaranteed source of water for production, and have often turned to purchasing potable drinking water for their industrial needs or simply locate their businesses elsewhere. In addition to industrial uses, the Dickinson Reuse Booster Station can also be used for a wide variety of situations that currently use potable water; such as watering the grass in parks and golf courses, cleaning trucks and equipment, construction dust control and even the production of brine solutions to control road ice in the winter. The initial cost impacts have been nearly recovered in the first 18 months of operations.

Category G: Water Resources

Winning Firm: Houston Engineering Inc.

Project Name:

4th Street South Flood Protection, Fargo, ND

For years, the residents of Fargo faced grueling fights against floods—fights which involved sandbags, clay levees, and construction equipment throughout their backyards. While permanent flood protection existed along 4th Street South, it proved inadequate come the 2009 flood. Further investigations revealed instability in the existing levee, which led to its reconstruction. The City of Fargo retained Houston Engineering, Inc. (HEI) to design a solution.

A failure of the 4th Street South levee would prove a disaster, not only because of the dense residential population, but also the presence of Fargo's water treatment plant (WTP). The loss of clean drinking water—something most take for granted—would elevate a flood emergency to an outright disaster. The new levee and floodwalls provide more than adequate protection. The team ensured that the new flood protection's reliability would not be compromised by any above- or below-ground features.

Designs also accommodated the needs of the Fargo WTP, including a reverse osmosis discharge line vital to the WTP's operations. The project team went great distances during construction itself. For example, the project team avoided impacts to the Fargo WTP during construction. Construction was phased in a way that allowed approximately two dozen semi-trucks per week to make deliveries to the WTP, which are vital to the production of clean drinking water for more than 100,000 residents. The team also altered designs on the fly due to the impacts of construction on a nearby condominium. Because of this project, properties will stay out of the floodplain, and residents will not have to pay for mandatory flood insurance, saving them each hundreds of dollars per year. Furthermore, residents and the WTP can rely on the certified flood protection, reducing the likelihood for future emergency flood-fighting efforts. This will save both money and effort into the future.

Jury Comments

Residents of Fargo have been dealing with flooding issues for years. These flood fights included clay levees, sandbags, and destruction to their yards from construction equipment. During the 2009 flood, it became apparent that existing flood protection proved inadequate. The levee along 4th Street South needed to be fixed and upon further investigations it was determined it needed to be reconstructed. This was ultimately proved important not only to the residential population, but also to protect Fargo's water treatment plant. If the water treatment plant were compromised during a flood, the result would be disastrous. The team assembled did well in ensuring that the new flood protection would not be compromised by any above- or below-ground features. The team also altered designs on the fly due to the impacts of construction on a nearby condominium. The design should be commended for accommodating the reverse osmosis discharge line needed for the Fargo water treatment plant's operations. The residents and water treatment plant now have a certified levee taking them all out of the floodplain.

Category H: Transportation

Winning Firm: Apex Engineering Group

Completed Corridor; Looking East from 42nd Street

Work Zone Traffic Control: one lane of traffice maintained in each direction at all times.

Storm sewer improvements were often in conflict with other utilities such as the water main shown here.

Project Name:

13th Ave. South - 38th Street to 45th Street, Fargo, ND

Apex Engineering Group, with the City of Fargo, provided design and construction engineering services for the reconstruction of 13th Avenue South from 38th Street to 45th Street South. This major arterial is one of the busiest corridors in North Dakota, providing access to one of the largest shopping malls in the region and a thriving business and retail district. Reconstructing this corridor was necessary to improve safety, mobility and capacity for the traveling public.

The primary project objectives were to improve safety and traffic capacity on 13th Avenue South by reconstructing the existing four-lane arterial and creating a revitalized six-lane concrete street. The project featured storm sewer improvements, watermain improvements, new street lights, traffic signal improvements and new pedestrian facilities including an expanded shared use path on the south side.

The City of Fargo required at least one lane of traffic to be maintained in each direction on 13th Avenue South throughout construction. Apex developed a detailed phasing and work zone traffic control plan. This was especially difficult at the intersection of 42nd Street and 13th Avenue South where the contractor was required to excavate, remove and replace public utilities, and install the concrete pavement, while maintaining traffic in all four directions. In addition, Apex coordinated with the existing private utility companies along the corridor, many of which had to be relocated in order to avoid project delays.

Due to the high visibility of this project, the marketing and communications firm Flint Group was enlisted to serve as a public information coordinator. The public outreach program utilized bi-weekly meetings for businesses, a project specific website, social media and local news casts to keep the public informed.

Apex is honored to have worked with the City on this project, which has successfully improved travel and access through one of the busiest business districts in Fargo.

Jury Comments

This project is a complex urban project that needed to address the R/W constraints, upgrades to the sanitary and storm sewer systems and the water lines, all while maintaining one lane of traffic in each direction for up to 30,000 vehicles per day.

Significant planning was required both during design and construction on a project scale this large. Apex established a Project Review Committee from Apex's firm and the City of Fargo's staff, so as to minimize any major design changes late in the process. A public information plan as well as weekly public forums were established to facilitate public outreach to affected business's and the public during the construction phase.

Apex was also tasked with the responsibility of coordinating the private utility work on the project to ensure that the prime contractors schedule would not be impeded.

APEX's diligent efforts in all phases of the work on this very complex urban reconstruction project is recognized and they therefore won the Engineering Excellence Award in the Transportation Category.

Category I: Special Projects

Winning Firm: KLJ

Project Name:

Crooked Crane Trail, Dickinson, ND

The Crooked Crane Trail Exercise and Fitness Loop is a 1.8-mile trail situated along the north shoreline of Patterson Lake, near Dickinson, ND. KLJ was hired to provide design and assist with construction administrative services.

The trail now includes a cluster of fitness machines designed to allow multiple users to stretch their muscles at the beginning of their fitness trail experience. An additional three to four machines within the same cluster were designed to challenge the strength of fitness for path users and provide a solid conclusion to the path experience. Trail users may bypass the use of all fitness equipment and simply enjoy the path on a run or walk by themselves, in a group or with their children.

The 10-foot-wide concrete path can safely accommodate a variety of simultaneous users such as cyclists, rollerbladers and other non-motorized modes of traffic.

Two additional clusters with three to five pieces of fitness equipment were placed at regular intervals throughout the trail. Safety along the trail and at exercise areas is enhanced by strategically placed lighting.

Community support and excitement was encouraged through a logo and branding competition. Local artists were able to submit their designs for a chance to brand the trail, along with featuring the logo as a sculpture at the trailhead.

To promote and encourage family use and experience, each fitness equipment cluster includes a children's play feature and outdoor learning station so that family fitness, learning and play can be combined into the outdoor trail experience.

Jury Comments

This project is a very unique multi-user trail that surrounds Patterson Lake about two miles west of Dickinson, ND. What makes this project stand out from other trails is the location, adjacent to Patterson Lake, and the exercise and play equipment that was incorporated into the project. The exercise and play equipment was selected to achieve a well-rounded total body workout, while providing social and play activities for the children.

While face-to-face meetings with the owner and the public are becoming common, during the planning stages of most projects, the diversity of the various groups involved in this project makes this project unique. The designer had to incorporate the desires of walkers, bikers, joggers, and family use. This project did well in all these areas. As indicated in the letter of support from the City of Dickinson, this project is a "game changer" for the improved quality of life and recreation within the greater Dickinson community.

KLJ's outstanding efforts in coordination with the many stakeholders, incorporation of the adult and children's exercise equipment and utilization of the beautiful environment adjacent to the project, made this project the winner in the Special Projects Category.

Category J: Small Projects

Winning Firm: Mercer Engineering, PC

Project Name:

NDK Treehouse, Bismarck, ND

Mercer Engineering, PC of Minot, ND is the recipient of the ACECND 2016 Small Project award. The Kids Treehouse Gallery project is housed in the North Dako ta Heritage Center & Museum located in Bismarck, North Dakota.

Building Four Fabrications, LLC (B4F) from Georgia contacted Mercer Engineering, PC (MEPC) for structural engineering services to develop their Treehouse concept into a buildable project.

B4F constructed a papier mâché model identifying the allocated space for the project. The Treehouse had to fit into a wedge shaped space, cantilever over a floor supported HVAC/heating mechanical duct, and meet current building code requirements.

MEPC coordinated structural framing geometry using CAD for the Visual Analysis analytical model as well as the construction drawings. Light gage metal studs and joists were selected to provide the framing system and non-combustible sheathing provided the envelope for B4F to attach the papier mâché for imagery.

North Dakota created an asset in the Heritage Center & Museum that has attracted an estimated 125,000 children during 2016, who may return to learn more about the history of North Dakota, its settlement by both Native Americans and immigrants as well as the exciting times of the dinosaurs.

The Kids Treehouse Gallery is a child magnet that is FUN. It's a hands-on experience that stimulates a child's creativity. Making an adventurous experience for them is the mission of the project. It is exciting for a child to imagine being a fireman or an airplane pilot, and learning to make change at a grocery store or at a bank.

Every child can now have a Treehouse. Most important is the opportunity for them to get excited about math, science, and engineering.

Mercer Engineering, PC is privileged to have participated with Building Four Fabrications, LLC to create the Kids Treehouse that will stimulate the imaginations of children for decades.

Jury Comments

The ND Heritage Center and Museum provides the public, both young and old, with an extensive historical experience ranging from dinosaurs that roamed North Dakota, tribal villages and Native American life to settlement and defense of the state and nation. It's a lot to be absorbed by even the most attentive student of natural history. So much information can be overwhelming for most young children. To make the visit fun for the children, the Center added an "IMAGINEERING" room for the children to explore and have their creativity stimulated. Every child, at one time or another, has probably wished to have a treehouse in their own back yard, to escape to places in their dreams.

Mercer Engineering, PC provided the structural engineering for the designer's concept. The treehouse had to fit into an irregular trapezoidal shaped space in the horizontal plane, while cantilevering over an existing mechanical air duct and tucking under suspended facia in the vertical plane. The complex space challenged the framing geometry. Light gage steel covered by fire resistive sheathing provided the structural integrity to protect the health and welfare of the young visitors. Code compliant stairs were incorporated into the Tree Trunk to provide access to the Treehouse platform above, insuring that an adult could retrieve a timid child afraid to come down the slide or stair.

The Treehouse is reported to be the highlight of every child's visit to the ND Heritage Center.

Category K: Energy

Winning Firm: Ulteig Engineers Inc.

Project Name:

Veterans Boulevard T-Line Upgrade & Substation, Fargo, ND

The cities of Fargo and West Fargo have sustained a continuous growth that has increased electrical load in many areas. One of these areas was the Veterans Boulevard corridor between Fargo and West Fargo. A major part of that growth was driven by the construction of the new Sanford Medical Center. In order to help the local power cooperative, Cass County Electric, supply power to meet this growth, Minnkota Power Cooperative partnered with Ulteig to design its new 115/25 kV substation and associated transmission line upgrade.

The Veterans Boulevard project went beyond the basic design of supplying power to customers. New construction materials and design methodologies were incorporated while the team innovated new ways to allow for system expansions and upgrades. The team successfully reduced the impact on neighboring transmission and distribution lines, helping to minimize outages and costly system rework. New design elements were incorporated according to MPC and CCEC standards and have reliably supplied power to the greater Fargo community while quietly blending into the background of the neighborhood.

"Ulteig has continually met or exceeded all our expectations, and this project was no different," said a representative from Minnkota Power Cooperative who worked closely with Ulteig on the project. "The team was instrumental in helping us align our own design standards with the city's aesthetic requirements."

Between design and energization of the project, many new apartments, restaurants, housing developments and businesses were built. Additionally, the Sanford Medical Center had moved into its final stages of construction. This system, which is currently operated at 69 kV, has the ability to be switched over to 115 kV without major changes or construction. In addition, space was allocated for a future switchgear inside the substation fence. The Veterans Boulevard project is set to meet power demands for decades to come.

Jury Comments

The growth of Fargo and West Fargo and the new Sanford Medical Center is driving the additional power load in the Veterans Boulevard corridor. This growth required the increase in voltage of the transmission line system from 69kV to 115kV and a new substation in an urban environment made up of retail, single family and multi-family residential properties. In addition to the technical requirements, the goal of the design was to reduce the visual impact and to screen the electrical equipment. By working with Minnkota Power Cooperative and Cass County Rural Electric, an alternative metal-clad switchgear provided a compact design that could nearly be concealed by an innovative black mesh fence with brick columns and landscaping to meet the aesthetic requirements of West Fargo. The transmission line had unique structure configurations to eliminate the need to raise two foreign transmission lines, saving time and associated power outages. The project provides a reliable power system for the customers while quietly blending into the background in the neighborhood.

North Washington Street Watershed, Bismarck, ND

Apex Engineering Group

The City of Bismarck has continued to see population and physical growth over the last decade. As the city expands, the needs of the land must be taken into account, beginning with stormwater drainage and storage. To assist, the city completed a qualifications-based selection and chose the expertise of Apex Engineering Group to provide planning, modeling, design, and construction services for improvements to the North Washington Street Watershed.

The North Washington Street Watershed in north Bismarck is crucial for the development and expansion of the city. One of the many projects that have taken place within the watershed is the regional stormwater improvements, thus creating proper drainage and storage for the North Washington Street Watershed to meet stormwater ordinances and permitting requirements.

With proper preparation, the required regional stormwater improvements within the North Washington Street Watershed have been constructed and are functioning as intended. By designing the sanitary sewer system in conjunction with stormwater improvements, the city realized a time and cost savings.

The city views Apex as trusted advisors and recently awarded Apex the design of the next set of regional stormwater improvements within the watershed. The North Washington Street Watershed directly impacts the future growth for the city.

Leland Olds Station: Interim Ash Dewatering Structure
Stanton, ND

Braun Intertec

Braun Intertec was selected by Basin Electric Power Cooperative (BEPC) to provide geotechnical engineering evaluations and recommendations for the proposed Interim Ash Dewatering Structure at the Leland Olds Power Station in Stanton, North Dakota. The footprint of the structure was 220-by-240 feet and consisted of three settling tanks, a wet well, a fabric roof for winter operations, and a series of reinforced concrete basins that were heavily loaded and intended for a three-to-five year design life.

Braun Intertec began drilling soil borings within two days of being requested. After the first day of drilling, Braun Intertec contacted the designer with AMEC Foster Wheeler to describe the unfavorable conditions encountered. Normally these conditions would require expensive and time-consuming site improvement techniques to provide suitable support for the structure. However, by using the site's history as a bottom ash stockpile, Braun Intertec was able to recommend constructing the structure directly on the existing fill without extensive site improvement work or construction of deep foundations. Braun Intertec continued to provide construction materials testing services during construction for earthwork, reinforcing steel, concrete and installation of drilled shafts. The project was operational 34 hours before the regulatory six month deadline.

North Dakota Highway 23 Rehabilitation, Ward County, ND

Houston Engineering, Inc.

The oil boom in western North Dakota increased traffic and loads along ND 23. To address traffic flow and safety concerns, the North Dakota Department of Transportation (NDDOT) retained Houston Engineering, Inc. (HEI) to perform preliminary and design services and construction plans for 27 miles of ND 23.

This segment was to receive full-depth reclamation, improving ride quality and renewing the roadway's life. But safety and quality of life were not improved by simply repaving. Large semis and agricultural equipment stopped traffic along the two-lane highway when making left turns, causing traffic to come to a complete stop on the 65-mph roadway. New turn lanes were added to intersections to reduce this conflict. Furthermore, new passing lanes were added every 2-3 miles, allowing faster traffic safe opportunities to pass. Safety was also improved by widening the highway's shoulders from two to eight feet allowing motorists to safely pull off from the roadway during emergencies. One complication came during a 2011 flood in the area while the project was in preliminary planning. HEI explored several solutions with the NDDOT and completed two emergency grades. ND 23 is now a safer roadway with improved traffic flow that's also protected from flood events.

Stump Lake Park Bank Stabilization
Stump Lake, ND

KLJ

Stump Lake Park is a peninsula on the north shore of Stump Lake with more than 20,000 visitors annually. Over the past 30 years, increasing lake levels and waves eroded 500 feet of the park's western shoreline. The erosion contributed to the flooding of the park's original café, causing damage beyond repair. Flooding also threatened the park's historic pavilion, restrooms, event shelters and baseball field.

As a result, Nelson County commissioned KLJ to create a plan to protect and conserve Stump Lake Park's amenities. A secondary goal was to stop further loss of trees to erosion over approximately 1,800 feet of shoreline.

KLJ accomplished these goals in four key steps. First, dead trees were cleared out to make room for construction operations. Second, the shoreline was reshaped to replace eroded soils and re-establish a slope. Third, the newly sloped shoreline was armored with riprap in a layer that is approximately two feet thick. Finally, existing vegetation was restored in the areas disturbed by construction activities.

The park is now considerably more protected from future erosion and flooding. As a result, the fishing, baseball, skating, weddings and all other activities the park is known for will continue into the foreseeable future.

Upper Maple River Dam
Steele County, ND

Moore Engineering, Inc.

The Upper Maple River Dam (UMRD) in Steele County protects over 22,000 acres of productive farmland, miles of roads and the livelihoods of North Dakotans who depend on reliable water conditions.

Moore Engineering guided the project from conception to completion. As the engineer for the Maple-Steele Joint Water Resource District, Moore planned and conducted public input sessions, addressed landowner concerns, provided design and location options, facilitated decision making, managed construction and even hosted the dedication ceremony.

The UMRD is a dry dam featuring an earthen dam embankment with a principal spillway, accompanied by a concrete emergency spillway and tie-off levee construction. The embankment is 35 feet tall, 20 feet wide and 5,000 feet long. The dam can store 9,950 acre-feet of water in a 925 acre pool. Its average peak flood risk reduction is 86 percent for a 100-year, 24-hour rainfall and 58 percent for a 100-year snowmelt. The project also raised flood-prone roadways, improved culverts and removed an existing dam.

Moore was instrumental in putting together a workable funding package for the $9.2 million project, with funds coming from the North Dakota State Water Commission, the Red River Joint Water Resource District, Cass County and through assessments paid by downstream property owners benefiting from the dam.

NDDOT Project No. 3-052(042)198, Near Carrington, ND

Sambatek

US Highway 52 provides a high degree of mobility in supporting national and statewide economic activity. Significant increases in truck traffic had accelerated the asphalt pavement distress, as well as reduced operational efficiency of the intersection with US 281 and ND 200 in Carrington. A rehabilitation project was needed to fulfill NDDOT's mission to "Safely move people and goods."

In June 2014, NDDOT made an executive decision to increase the rehabilitation scope of the project due to the availability of federal highway funds. The revision to a Major Rehabilitation required improved shoulder width and intersection level of service. These desired improvements created several significant challenges, from minimizing wetland impacts to the Pipestem Creek, to intersection improvements in Carrington. Sambatek prepared a Documented CATEX (DCE) environmental document including roadway width and intersection improvement alternatives. NDDOT approved the project DCE and the Carrington roundabout on September 9, 2015 and successfully bid the project in April 2016.

The efficiency in this project's development and delivery is another great example of NDDOT and their engineering consultant's abilities to collaborate effectively and deliver a world-class transportation system within the challenge of transportation funding and significant statewide needs.

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FARGO – 2ND STREET IN-TOWN LEVEES

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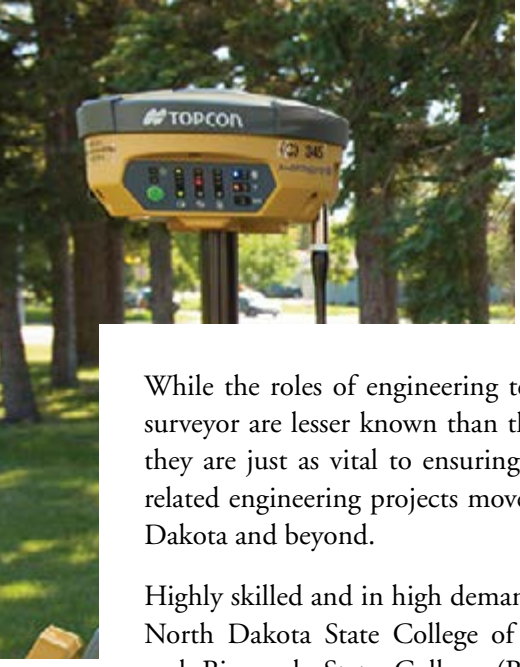
HoustonEngineering Inc.

houstoneng.com



The Vital Role that Engineering Technicians and Land Surveyors Play

Marnie Piehl, Director of College Relations, BSC

While the roles of engineering technician and land surveyor are lesser known than the role of engineer, they are just as vital to ensuring that construction-related engineering projects move forward in North Dakota and beyond.

Highly skilled and in high demand, graduates of the North Dakota State College of Science (NDSCS) and Bismarck State College (BSC) programs are snapped up even before they graduate.

"We've had many years where we see more open positions than graduates of the program," says Dave Sagsveen, BSC associate professor of Civil Engineering Technology.

Working closely with industry, both colleges are focused on training students to meet that need. BSC President Larry C. Skogen says industry support is vital when it comes to access to equipment and industry knowledge.

Dr. Larry C. Skogen

"Our students really benefit from the relationships created through BSC's Engineering Technology Advisory Team. We get a diverse group representing local engineering and surveying firms, government agencies, and power cooperatives guiding our curriculum and making sure that our graduates are ready with the most current skills when they graduate," Skogen says.

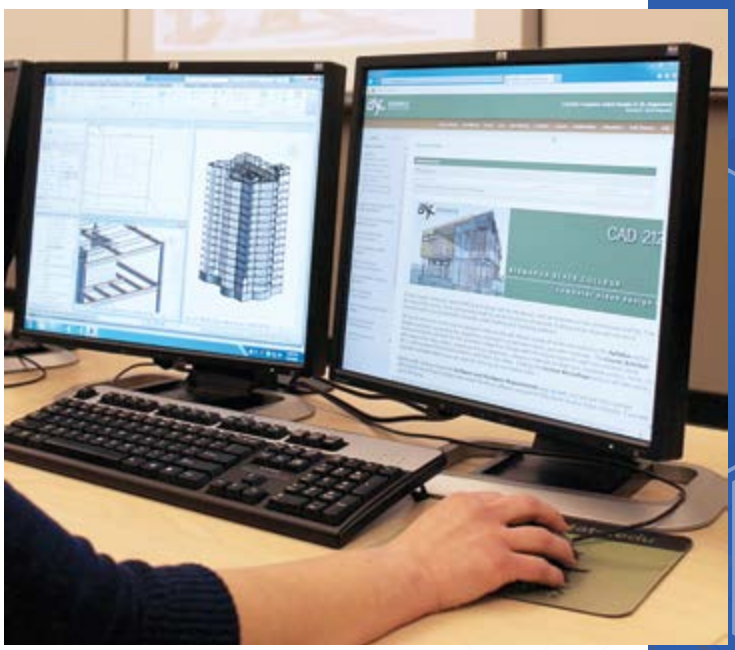
Industry partnerships are strong at NDSCS as well. Donations from RDO Integrated Controls, RDO Equipment Co.'s positioning division, provide land surveying and civil engineering technology students the opportunity to train on state-of-the-art equipment.

Every fall, RDO Integrated Controls provides the College with the latest field equipment for the academic year free of cost. RDO also provides free faculty training, support and equipment setup. The equipment is returned each May and replaced each August with updated equipment.

"NDSCS students are learning their craft on the highest caliber land surveying and civil engineering technology equipment available today," said NDSCS President John Richman. "Partnerships, like that of RDO Integrated Controls, are invaluable in the classroom and ultimately to the state's workforce."

Dr. John Richman

Tyler Paul is the CADD and GIS Manager at Houston Engineering in Bismarck. He earned two 2-year degrees from BSC. First, he received an engineering transfer degree that took him to NDSU to pursue a four-year degree in electrical engineering. There, he



BSC student working on 3D building model using CADD.

Right: NDSCS students experience hands-on learning using the leading industry equipment in land surveying, quality assurance and design drafting.

had a change of heart and returned to BSC to pursue an engineering technician degree.

"I didn't want to be an engineer," Paul says, "I wanted to be engaged in software and technology, troubleshooting."

He says the versatility of his degree means he's involved in every discipline of engineering, but not limited to any of them. "With a technician degree you can move around in response to the marketplace. It's different every day."

As part of the local Young Professional Network, Paul visits high schools, exposing students to some of the lesser known options within the world of engineering. "I want them to know there are a lot of two-year options that pay well and are fun."

NDSCS graduate Kevin Gunderson feels like he found one of those fun options. He's a CADD Technician at Moore Engineering.

"It's interesting to do something on a computer and then go out and see it built and see people using it," he says.

After an early stint studying pre-architecture, Gunderson transferred to NDSCS because it allowed him to focus on the technical elements he was drawn to. "I really liked working with CADD programs, so I looked around and found that NDSCS offered me that emphasis as part of the Land Surveying degree."

Gunderson had two job offers prior to graduation, and chose Moore, where's he been ever since.

"It's been great. And, I can see how, with this two-year degree, I can move up in my career."

For more information about Bismarck State College's engineering programs, go to bismarckstate.edu/academics.

For more information about engineering programs at North Dakota State College of Science, go to ndscs.edu/academics.

Below: Robotic Total Station provides hands-on industry experience for BSC engineering tech students.

Industrial Generation As A Driver Of Economic Growth

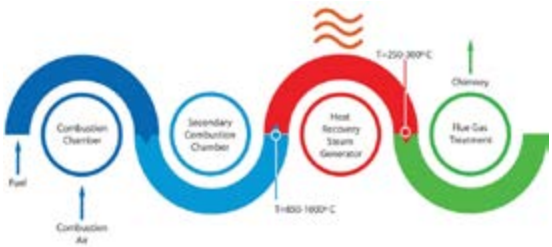
Christine Harley, Vice-President, Director of Marketing, Energy, U.S., WSP

The plunge in crude oil prices over the past two years has led to an associated contraction in economic growth in key U.S. oil and gas basins, particularly in North Dakota. With North Dakota's unique combination of natural beauty, low business costs, top agricultural production, and a relaxed and welcoming outdoor lifestyle, the state is actively looking for other ways to drive growth.

As reported by the state's Economic Development and Finance Division, North Dakota is the second largest oil producer in the nation and is ranked in the top 10 for wind capacity. A key focus of economic growth is the energy sector, which is now the third -largest industry in the state. A comprehensive energy policy (EmPower North Dakota) supports this growth.

A critical component for supporting growth of the state's energy sector is providing efficient and appropriately sized power plants to support energy and other projects. Industrial-scale generation or cogeneration is an obvious choice to meet these needs. Sometimes called combined heat and power, cogeneration allows for the use of waste heat created during the production of electricity to be used for facility or district heating, as shown in the process diagram (Figure 1). This excess heat capture boosts efficiency by consuming less fuel to produce the same amount of useful energy. Environmental benefits include the reduction of greenhouse gas and other air pollutants, by burning less fuel to produce each unit of energy output and avoiding transmission and distribution losses. Economic benefits include savings on owner energy bills as well as a potential hedge against electricity cost increases.

Figure 1



Cogeneration can be used to power refinery and pipeline, manufacturing, agricultural production, or other industrial facilities. It can also provide district heating and cooling for groups of buildings, such as office complexes, residential developments, schools and college campuses, or data center complexes. Cogeneration offers the stable, yet flexible, and highly reliable energy required by such facilities, particularly those that are islanded from the main grid.

North Dakota provides secure, proven natural gas resources that ensure a stable and low-cost energy supply, which can be used to provide an uninterrupted power supply for the range of facilities described. To be a qualifying cogeneration facility in North Dakota, a facility must be 80 megawatts or less, as defined by North Dakota Administrative Code, Chapter 69-09-07, Small Power Production and Cogeneration. The state offers a number of incentives that support the development of cogeneration, including net-metering and renewable and recycled energy objectives.

Smaller, more local generation facilities can be permitted and constructed more quickly than a full-scale power plant. A local cogeneration plant can also achieve greater reliability than the grid, provide a buffer from environmental events that disrupt grid power, and offer immunity from grid fluctuations caused by renewables. This benefit will become more important over time, with the state projecting wind power growth to 2,500 megawatts when all announced projects are realized.

As engineers continue to provide the critical analysis, design, and construction expertise to develop support infrastructure throughout the state, cogeneration facilities should be considered as an important part of that portfolio. Whether you call it industrial generation, cogeneration, or combined heat and power, the environmental, economic, efficiency and reliability benefits of these facilities are proven and clear. Using cogeneration advances a variety of engineering opportunities and moves projects forward – driving state economic development.

Get to Know Our Advertisers

Associated General Contractors of North Dakota

Russ Hanson
P.O. Box 1624,
Bismarck, ND 58502
701.223.2770
rhanson@agcnd.org
www.agcnd.org

Established

1951

Firm Description

AGC of ND is the largest commercial construction trade association in North Dakota representing contractors performing all facets of commercial construction. The association also has membership of subcontractors, equipment/material suppliers and related services.

Firm Personnel

Other Professional Personnel (5)

Total Personnel

5

Disciplines Offered

Trade Association

Braun Intertec

Steve Nagle
526 10th Street NE, Suite 300
West Fargo, ND 58078
701.214.7846
701.232.8701 (fax)
snagle@braunintertec.com
www.braunintertec.com

Established

1957

Firm Description

As an industry leader with a combined team of more than 700 engineers, scientists, managers and field personnel, Braun Intertec specializes in more than 50 technical disciplines that bring expertise, experience, passion, and commitment to our clients. We're the people you can rely on to be your partner and source of knowledge from start to finish on a project.

Firm Personnel

Professional Personnel (700+)

Total Personnel

700+

Disciplines Offered

Environmental
Structural
Geotechnical
Materials Testing
Nondestructive Examination (NDE)

Projects

4 Bears Bridge - New Town, ND

Fargo-Moorhead Area Diversion Project, ND

Dakota Prairie Refinery - Dickinson, ND

Watford City Event Center & Watford City High School - Watford City, ND

Get to Know Our Advertisers

Brosz Engineering, Inc.

Gary Brennan
P.O. Box 357
109 South Main
Bowman, ND 58623
701.523.3340
701.523.5243 (fax)
garyb@broszengineering.com
www.broszengineering.com

Established

1982

Firm Description

Brosz Engineering operates a general consulting engineering practice that specializes in civil engineering, with offices located in Bowman, Stanley and Watford City, ND and Pierre, Sturgis and Sioux Falls, SD. Brosz Engineering serves a client base made up of government and private clients located throughout North and South Dakota and Eastern Montana. We provide a full range of professional services from planning and development, survey and design engineering to construction inspection, materials testing and administration.

Firm Personnel

Engineers (31)
Engineering Technicians (24)
CADD (35)
Surveyors (14)
Other Professional Personnel (9)
Other Technical Personnel (1)

Total Personnel

79

Disciplines Offered

Architetural
Civil - General
Civil - Transportation
Surveying/GIS/Mapping
Water/Wastewater
Hydrological

Projects

Bowman Regional Airport, Bowman, ND

ND 23A/12th Street Roundabout, Watford City, ND

Baker Water Storage Tank, Baker, MT

Little Missouri Low Water Crossing, Slope County, ND

General Steel & Supply Company (A Division of Fisher Industries)

Curt Kittleson, General Manager
3020 Energy Dr.
Dickinson, ND 58601
701.456.9184
701.456.9193 (fax)
Sales@fisherind.com
www.fisherind.com

Established

1967

Firm Description

General Steel and Supply Company is the manufacturing division of Fisher Industries. We design and fabricate high-quality aggregate processing equipment for Fisher Sand and Gravel, the parent company of Fisher Industries, as well as for outside customers. We employ skilled engineers who work closely with field operations on a daily basis in order to get first-hand understanding of problems and solutions.

Firm Personnel

Engineers (2)
CADD (2)

Total Personnel

2

Projects

Patented Fisher Air Separator - Our signature piece of equipment. It is being used by customers worldwide.

Get to Know Our Advertisers

Holly Beck Surveying & Engineering, Inc.

Holly Beck
3120 E Broadway Avenue
Bismarck, ND 58501
701.223.3546
hollybeck@hollybecksurveying.com
www.hollybecksurveying.com

Established

2003

Firm Description

Holly Beck Surveying & Engineering is headquartered in Bismarck, ND and has grown from a one-person firm in 2004 to a staff of 10-15 permanent and seasonal employees during the construction season. We have the resources to staff 3 survey crews, as well as provide civil design, construction administration, inspection and material testing.

Firm Personnel

Engineers (3)
Surveyors (4)
Other Professional Personnel (1)

Total Personnel

8

Disciplines Offered

Civil - General
Civil - Transportation
Construction Management
Surveying/GIS/Mapping
Water/Wastewater

Projects

BNSF Grade Separation/Overpass Dickinson, ND

Keene Corner Roundabout, Intersection of ND Highway 23 & County Road 10

Civil Site Plan, Exxon Convenience Store, Bismarck, ND

Construction Management of Statewide Sign Replacement Project, ND

Houston Engineeing, Inc. (HEI)

Heidi Schuer
1401 21st Avenue N
Fargo, ND 58102
701.237.5065
hschuer@houstoneng.com
www.houstoneng.com

Established

1968

Firm Description

Houston Engineering, Inc. is a full-service, multidiscipline engineering firm. With seven offices throughout North Dakota and Minnesota, we offer a full range of services that covers water resources, environmental issues, water supply, municipal transportation, surveying, land and site development, waste management, GIS, and planning. We utilize the latest technology to complement our traditional experience, all to provide innovative solutions that produce results now and continue to provide value well into the future.

Firm Personnel

Professional Personnel (180)

Total Personnel

180

Disciplines Offered

Civil - General
Civil - Transportation
Environmental
Structural
Surveying/GIS/Mapping
Water/Wastewater
Hydrological

Projects

Downtown Infrastructure Improvements, Minot, ND

2nd Street In-Town Levees - Fargo, ND

Jackman Coulee - Bismarck, ND

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Interstate Engineering

Damon DeVillers, PE
P.O. Box 2035
1903 12th Avenue SW
Jamestown, ND 58402
701.252.0234
damon.devillers@interstateeng.com
www.interstateeng.com

Established

1976

Firm Description

Interstate Engineering provides civil engineering, surveying, and planning services to federal, state, local and tribal governments as well as to private individuals and corporations. With 14 offices and three satellite offices throughout North Dakota, Montana, South Dakota and Minnesota, we are positioned to serve our clients efficiently and effectively. From concept to completion, we have experienced staff ready to provide services for each phase of your project.

Firm Personnel

Engineers (34)
Engineering Technicians (29)
CADD (11)
Surveyors (14)
Other Professional Personnel (22)
Other Technical Personnel (20)

Total Personnel

130

Disciplines Offered

Civil - General
Civil - Transportation
Construction Management
Structural
Surveying/GIS/Mapping
Water/Wastewater
Hydrological

Projects

Ypsilanti Bridge - Stutsman County, ND
Chahinkapa Zoo - Wahpeton, ND
CIPP - Ray, ND
Aquatics Complex - Sidney, MT
BIA 14 - Fort Berthold Reservation, ND
Jamestown Regional Airport - Jamestown, ND
Point Bridge - Grand Forks, ND
ND200 Improvements - Hazen, ND
Pierre Flood Control - Pierre, SD
Strasburg Water System Improvements. Strasburg, ND

KLJ

4585 Coleman Street
Bismarck, ND 58502
701.355.8400
www.kljeng.com

Established

1938

Firm Description

Since 1938, KLJ has provided engineering-based services with local expertise to drive national, large-scale projects and deliver successful results. Our strong regional connections, responsive personal service and industry experience create strategic advantages for all clients. As an employee-owned firm, we invest in our futures through a commitment to creating sustainable environments. Through innovation and hard work, we develop lasting infrastructure that responds to the social, civic and economic needs of our communities.

Firm Personnel

Engineers (214)
Engineering Technicians (57)
CADD (49)
Surveyors (79)
Other Professional Personnel (99)
Other Technical Personnel (63)

Total Personnel

652

Disciplines Offered

Industrial
Civil - General
Mechanical
Civil - Transportation
Construction Management
Petroleum
Electrical
Power
Environmental
Process
Structural
Surveying/GIS/Mapping
Water/Wastewater

Projects

4 Bears Casino Expansion - New Town, ND
Williston Airport - Williston, ND
Highway 85 - Watford City Bypass - Watford City, ND
Shiloh Sports Complex - Bismarck, ND

Get to Know Our Advertisers

Mercer Engineering, PC

John Mercer
P.O Box 1185
111 11th Avenue SW Suite #2
Minot, ND 58702
701.839.1056
888.211.8370
engineer@minot.com
www.mercerusa.com

Established
1982

Firm Personnel
Engineers (1)
CADD (1)

Total Personnel
2

Disciplines Offered
Structural
Forensic

Structural Projects

Medical Park Mall - Grand Forks, ND

DeMers Avenue Store Front Renewal, East Grand Forks, MN

Pedestrian Bridge - Minot, ND

MW Industries Overhead Cranes, Kenmare, ND

Forensic & Expert Services:

Minard Hall Failure - NDSU - Fargo, ND

Eagle Rigid Span Farm Building Failure, Reeder, ND

Farmers Elevator Tipping Failure, Bottineau, ND

720,000 Bushel Grain Tank Failure - Minot, ND

Moore Engineering, Inc.

Gregory Wald
925 10th Avenue E
West Fargo, ND 58078
701.282.4692
701.282.4530 (fax)
gwald@mooreengineeringinc.com
www.mooreengineeringinc.com

Established
1960

Firm Description
Civil Engineers partnering with cities, counties, water resource districts, private developers, state and federal agencies, campuses and others to build a stronger region through municipal, transportation, water, GIS, survey and airport projects.

Firm Personnel
Engineers (78)
Engineering Technicians (22)
CADD (18)
Surveyors (18)
Other Professional Personnel (34)

Total Personnel
170

Disciplines Offered
Civil - General
Civil - Transportation
Construction Management
Surveying/GIS/Mapping
Water/Wastewater
Hydrological

Projects

Upper Maple River Dam - Steele County, ND

Shadow Wood Development - West Fargo, ND

Water & Sewer System Replacement, New England, ND

40th Avenue South Reconstruction, Fargo & West Fargo, ND

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Prairie Engineering, P.C.

Randy J. Axvig, P.E.
1905 17th Street SE
Minot, ND 587001
701.852.6363
619 Riverwood Drive
Bismarck, ND 58504
701.258-3493
raxvig@prengrbis.net
www.prairieengineeringpc.com

Established

1983

Firm Description

Prairie Engineering, P.C. is a mechanical and electrical consulting engineering firm founded in 1983 that serves the Upper Midwest States. Services are provided from offices in Minot and Bismarck, ND to meet the needs of area architects and facility owners. Staff members have many years of design experience with institutional, commercial, educational, governmental and industrial facilities.

Firm Personnel

Engineers (15)
Engineering Technicians (6)
Other Technical Personnel (2)

Total Personnel

23

Disciplines Offered

Mechanical
Electrical

Projects

Ward County Office Building & Jail Expansion, Minot, ND

Hoeven Elementary School - Minot, ND

Basin Electrical Power Cooperative Headquarters Expansion - Bismarck, ND

North Dakota Governor's Residence, Bismarck, ND

Ulteig

Craig Davies
3350 38th Avenue S
Fargo, ND 58104
701.280.8500
701.237.3191 (fax)
info@ulteig.com
www.ulteig.com

Established

1944

Firm Description

Ulteig Engineers, Inc. delivers comprehensive design engineering, program management and technical and field services that strengthen infrastructure vital to everyday life. Ulteig's footprint spans the nation and provides its expertise in multiple Lifeline Sectors™, including power (both electric utilities and renewables), transportation, water and oil and gas, to a wide range of public and private clients. For more information, visit www.ulteig.com and connect on LinkedIn, Twitter and Facebook.

Disciplines Offered

Civil - General
Civil - Transportation
Construction Management
Electrical
Power
Environmental
Surveying/GIS/Mapping
Water/Wastewater

Get to Know Our Advertisers

WSP | Parsons Brinckerhoff

Eric Michel
520 Nicollet Mall, Suite 800
Minneapolis, MN 55402
612.594.5496
michelej@pbworld.com
www.wsp-pb.com

Established

1933

Firm Description

WSP | Parsons Brinckerhoff, one of the world's leading engineering and professional services consulting firms, provides services designed to transform the built environment and restore the natural one. Our expertise ranges from environmental remediation and urban planning, to engineering iconic buildings and designing sustainable transport networks, to developing the energy sources of the future and enabling new ways of extracting essential resources. Approximately 36,500 employees work for this dynamic organization in 500+ offices across 40 countries worldwide.

Firm Personnel

Engineers (1,956)
Engineering Technicians (185)
CADD (220)
Surveyors (35)
Other Professional Personnel (540)
Other Technical Personnel (2,097)

Total Personnel

5,235

Disciplines Offered

Industrial
Architectural
Marine & Coastal
Civil - General
Mechanical
Civil - Transportation
Mining
Construction Management
Petroleum
Electrical
Power
Environmental
Process
Fire/Earthquake/Hazards/ Safety
Structural
Forensic
Surveying/GIS/Mapping
Geotechnical
Water/Wastewater
Hydrological
Planning, Economic/Financial Consulting
Operations & Maintenance

Projects

Coolidge Generating Station - Coolidge, AZ

E-470 Public Highway Authority Operations & Management - Denver, CO

Levi's Stadium - Santa Clara, CA

O'Hare International Airport Modernization Program - Chicago, IL

Ackerman-Estvold Engineering
1907 17th Street Southeast
Minot, ND 58701
701-857-9120
www.ackerman-estvold.com

American Engineering Testing, Inc.
99 26th St. East
Dickinson, ND 58602
701-483-4288
www.amengtest.com

Apex Engineering Group, Inc.
4733 Amber Valley Parkway South
Fargo, ND 58104
701-373-7980
www.apexenggroup.com

Barr Engineering Company
234 West Century Avenue
Bismarck, ND 58503
701-255-5472
www.barr.com

Bartlett & West Engineers, Inc.
3456 East Century Ave.
Bismarck, ND 58504
701-258-1110
www.bartwest.com

Bolton & Menk, Inc.
3168 41st Street South, Suite 2
Fargo, ND 58104
701-566-5339
www.bolton-menk.com

Braun Intertec Corporation
526 10th Street Northeast, Suite 300
West Fargo, ND 58078
701-232-8701
www.braunintertec.com

Brosz Engineering, Inc.
109 S. Main Street
Bowman, ND 58623
701-523-3340
www.broszeng.com

Communication Network Engineering, Inc.
210 27th Street North
Fargo, ND 58102
701-237-3433
www.cnefargo.com

DOWL
140 1st Street East
Dickinson, ND 58601
701-300-7014
www.dowl.com

HDR Engineering
4503 Coleman Street, Suite 105
Bismarck, ND 58503
701-557-9701
www.hdrinc.com

Holly Beck Surveying and Engineering
3120 East Broadway Ave
Bismarck, ND 58501
701-223-3546
www.hollybecksurveying.com

Houston Engineering, Inc.
1401 21st Ave North
Fargo, ND 58102
701-237-5065
www.houstoneng.com

Interstate Engineering, Inc.
1999 4th Street North, Suite A
Wahpeton, ND 58075
701-642-5521
www.interstateeng.com

KLJ
4585 Coleman Street
Bismarck, ND 58503
701-355-8400
www.kljeng.com

Mead & Hunt
8 Seventh Street N
Fargo, ND 58102
701-566-6450
www.meadhunt.com

Mercer Engineering, P.C.
111 11th Ave SW
Minot , ND 58701
701-839-1056
www.mercerusa.com

Moore Engineering, Inc.
925 10th Ave East
West Fargo, ND 58078
701-282-4692
www.mooreengineeringinc.com

Prairie Engineering, P.C.
619 Riverwood Drive Ste. 205
Bismarck, ND 58504
701-258-6857
www.prairieengineeringpc.com

Sambatek
2401 46th Avenue SE, Suite 202
Mandan, ND 58554
701-204-6845
www.sambatek.com

Short Elliott Hendrickson Inc. (SEH)
4719 Shelburne Street, Suite 6
Bismarck, ND 58503
701-354-7121
www.sehinc.com

SRF Consulting Group
One 2nd Street North Ste. 226
Fargo. ND 58102
701-237-0010
www.srfconsulting.com

Stanley Consultants, Inc.
600 South 2nd Street, Suite 120
Bismarck, ND 58504
701-751-4772
www.stanleyconsultants.com

Stantec
3453 Interstate Blvd South
Fargo, ND 58103
701-566-6010
www.stantec.com

Terracon Consultants
860 9th St NE, Unit K
West Fargo, ND 58078
701-282-9633
www.terracon.com

Ulteig Engineers, Inc.
3350 38th Ave South
Fargo, ND 58104
701-280-8500
www.ulteig.com

Wold Engineering, P.C.
316 Eastdale Drive
Bismarck, ND 58501
701-258-9227
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