Kiewit

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the magazine of kiewit corporation

KIEWAYS

Kiewit

Kiewit is one of North America's largest and most respected construction and engineering organizations. With its roots dating back to 1884, the employee-owned organization operates through a network of subsidiaries in the United States, Canada, and Mexico. Kiewit offers construction and engineering services in a variety of markets including transportation; oil, gas and chemical; power; building; water/wastewater; industrial; and mining. Kiewit had 2017 revenues of $8.7 billion and employs 22,000 staff and craft employees.

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KIEWAYS
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To contact us, visit kiewit.com.

BENEATH A PROJECT'S FEET
On Page 20, Kiewit Foundations Co. depends on intense technical details and a specialized equipment fleet to get the job done.

LOOKING TOWARD THE FUTURE

Our world is getting pretty complicated, and the construction and engineering industry has its work cut out for it. The projects Kiewit builds are growing in size and complexity, and there are far too many moving parts to track in spreadsheets and week-to-week number comparisons used in years past.

Here at Kiewit, our investment in technology has been one of our most important and game-changing commitments. On Page 14, we take you inside the Kiewit Management System, a modern set of data-driven technology tools and processes, integrated into the lifecycle of our projects for efficiency and productivity. It's designed to get better results, start to finish.

All of that technology is powerful, but it's not the only thing that helps Kiewit progress. Our people understand that "innovation" is more than the latest technology or sweeping change. Often it's a small shift in what we do or how we think that leads to smarter, faster and more effective results; take Kiewit Foundations Company for example. Years ago, we realized it was more efficient to self-perform our own geotechnical and deep foundations work. Today, that expertise has grown into a specialty subcontracting business that's a strong competitor for foundations work in a variety of markets (Page 20).

As our work evolves with the times, we're sometimes called to maneuver around the past. The Milwaukee Streetcar project (Page 6) is a fantastic example of creative thinking. Our team built a new streetcar system around some of the city's old, buried infrastructure, including tracks laid in the late 1800s, abandoned buildings and old coal-receiving basements.

From data-driven construction and engineering to the smaller, progressive steps we take toward productivity and efficiency, I'm confident that Kiewit people are ready to tackle the challenges of tomorrow — the proof is in their past performance.

BRUCE GREWCOCK
Chairman and CEO

AROUND THE CLOCK
Kiewit crews on the Milwaukee Streetcar project worked nights and weekends to minimize impacts through major intersections. More on their efforts on Page 6.

ON THE COVER

ALSO INSIDE

KIEWIT NEWS

What began in 1884 with two hard-working brothers has grown into a construction and engineering industry leader. As a multi-billion dollar organization, Kiewit can tackle projects of all sizes, in any market. Here's a brief collection of recent news and information from around the company.

OUR MARKETS

- BUILDING
- INDUSTRIAL
- MINING
- OIL, GAS & CHEMICAL
- POWER
- TRANSPORTATION
- WATER/WASTEWATER

OUR VALUES:

- PEOPLE
- INTEGRITY
- EXCELLENCE
- STEWARDSHIP

NEWSROOM.KIEWIT.COM
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HELPING HANDS FOR HABITAT

Volunteers from Kiewit's Central 70 and Brighton Boulevard project teams in Colorado recently spent a day with Habitat for Humanity in the Globeville and Elyria-Swansea neighborhoods, where they helped remove trees, paint, pour a sidewalk and build a fence.

EIGHT STRAIGHT

Great Place To Work. Best Workplaces™ CANADA 2018

Kiewit was recognized as a Best Workplace in Canada for the eighth year in a row. The list, published by The Globe and Mail and compiled by Great Place to Work Institute Canada, was announced in April. Salesforce, SAP and KFC were among other companies named to the list of 50 large/multinational organizations alongside Kiewit.

"This is an exciting accomplishment and reflective of the dedication our employees put into delivering some of the most critical engineering and construction projects in Canada, and into building, maintaining and continuously improving the company culture we are all very proud of," said John Shaw, vice president of Human Resources – Operations. "Our employees build landmark projects that provide all Canadians with the reliable transportation and energy infrastructure they depend on, with an unwavering commitment to safety, quality and environmental stewardship."

PLANS FOR PROPOSED PETROCHEMICAL PROJECT INCLUDE CHIYODA-KIEWIT JV

In May, a joint venture of ExxonMobil and Saudi Basic Industries Corp. announced it signed an engineering, procurement and construction contract with a Chiyoda-Kiewit joint venture for components of its $7.3 billion Gulf Coast Growth Ventures project. Located in San Patricio County, Texas, the proposed petrochemical project will include construction of a 1.8-million-ton ethane cracker facility. An ethane cracker processes ethane, which is found in natural gas, to create ethylene, which is used to produce plastic.

POWERING THE SUNSHINE STATE

Seminole Electric Cooperative, Inc. awarded TIC – The Industrial Company (TIC), a wholly owned Kiewit subsidiary, an engineering, procurement and construction (EPC) contract for a new natural gas plant in Florida.

Upon announcing the project award, Seminole Director of Engineering & Capital Development David Kezell said, "Seminole is confident that TIC is the right EPC contractor for this project. They have a great deal of experience on similar plants and have demonstrated that they are completely aligned with our shared vision for this important project."

Construction is anticipated to begin in late 2019. Upon completion, the plant will generate 1,050 megawatts of power.

safetyweek

SAFETY WEEK

Kiewit projects joined industry peers to reinforce and celebrate their commitment to safety during Safety Week, May 7-11. The event is coordinated by The Construction Industry Safety Initiative (CISI) group and the Incident and Injury Free CEO (IIF) Forum and is intended to inspire everyone to be leaders in safety. On the Midtown Express project in Texas, Kiewit Infrastructure Group President Scott Cassels joined crews for a field tour to talk about the work underway and safety planning.

WELCOME, INTERNS

In May, Kiewit welcomed more than 700 summer interns to the organization. The interns are assigned to Kiewit's project and office locations across North America. As an integral part of the Kiewit organization, they're working alongside employees to tackle important tasks that impact the bottom line and provide a hands-on look at what a career in the construction and engineering industry is like. Look for a feature on this year's Kiewit interns in the next issue of Kieways.

Keep up with Kiewit news and announcements and view Kieways articles digitally on the new Kiewit Newsroom at newsroom.kiewit.com.

GETTING MILWAUKEE READY TO RIDE THE RAILS

The downtown streetcar system will soon make its debut

1. Pedestrian control was a foremost concern during construction, particularly in areas such as the Historic Third Ward, a revitalized warehouse district filled with shops and restaurants. 2. Construction of a station platform is completed in the center of downtown Milwaukee. 3. Prepour checks are performed by Kiewit staff prior to every concrete pour.

You've likely heard the saying "everything old is new again."

That's never been more true than for Milwaukee, Wisconsin, where the downtown area is experiencing a type of déjà vu — but with a cleaner, quieter and more efficient twist.

This fall, residents, commuters and tourists alike will have the opportunity to get a ride via a new streetcar system.

A 2.5-mile Phase 1/Lakefront starter route will begin at the Milwaukee Intermodal Station, a hub for 1.4 million bus and train passengers annually. In total, there will be 20 sheltered stops on the north-south rectangular route that covers 40 city blocks and also loops by Lake Michigan.

The new streetcar system is a far cry from the one that carried passengers in the mid-19th century. Back then, horse-drawn cars on rails were the conveyance. In 1890, the system transitioned to electric trolley cars.

This fall, a fleet of five sleek, modern streetcars — powered by an overhead contact system (OCS) — will take its place on the rails and share the road with cars and buses. Each streetcar has a capacity of 150 passengers and has roll-on/roll-off access for wheelchairs, strollers and bikes.

A LEAP OF FAITH?

The streetcar system marks a couple of notable firsts for Kiewit Infrastructure Co., which won the $67 million CMGC (Construction Management-General Contractor) contract in 2016.

It's Kiewit's first-ever streetcar project and first project for the City of Milwaukee.

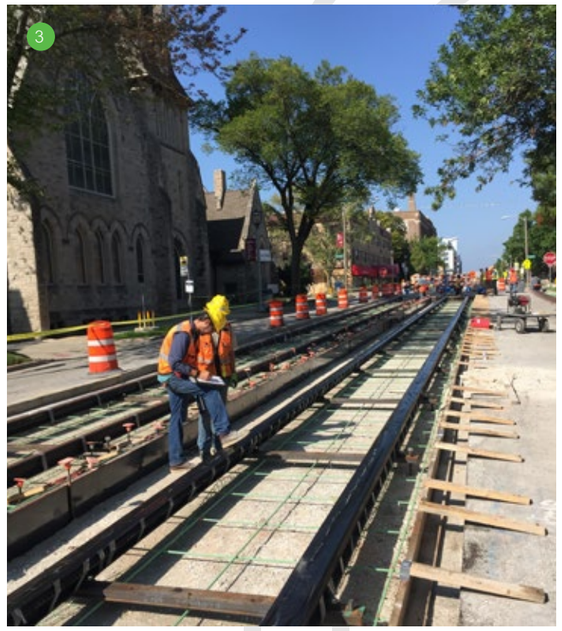
The scope of work includes laying over 500 pieces of 80-foot long rails, welded into long strings to construct embedded track into the existing roadway; constructing the OCS consisting of foundations, poles, wires and three substations that power the system; and building a 16,000-square-foot operations and maintenance facility to service and house the streetcars.

Entrusting Kiewit with the work may have been a leap of faith for the City of Milwaukee. But Kiewit's reputation, along with a prolific and successful track record with light rail and other transportation projects, gave city leaders confidence.

SHARING THE ROAD, SHARING INFORMATION

"This streetcar system, by its nature, is pretty interesting," said Project Manager Mike Ethier.

"You're literally building a track in the middle of downtown streets. It's not grade separated, it's not separated by traffic, so you're combining railroad construction and road construction all at once."



Milwaukee Streetcar starter route

The Milwaukee Streetcar's initial route connects riders to many downtown destinations including restaurants, parks and the Milwaukee Public Market, and links areas with high employment opportunities with the highest-density residential neighborhood in the state. Officials selected this route for its ability to provide alternative transportation to a large population of riders today, and the potential to spur more economic development in the future.

Source: TheMilwaukeeStreetcar.com

That concept of shared use — meaning that the streetcars operate in the same lanes as other vehicles — is unique to this mode of transportation. Kiewit understood the nuances involved with that and the need to create open communication among all stakeholders.

"There are a number of access points to thousands of units, condo buildings and driveways, and to major loading docks for grocery stores and all the major downtown employers," said Carolynn Gellings, the project's construction manager for the City of Milwaukee.

"Building tracks through those areas is extremely challenging. Having Kiewit be upfront with their information and willing to work with all these different entities really put a good face on the project."

DIGGING THROUGH HISTORY

Ethier says one of the more compelling parts of the project has involved a bit of construction archaeology.

"Working in old cities with old infrastructure, we've become very accustomed to working around unexpected, unknown utilities and finding things in the ground every day that are a big mystery," he said.

Building the local workforce

Terry Alexander has lived in Milwaukee about 20 years — about as long as he's worked in the construction trades.

Last year, he added streetcar rail construction to his list of experience, thanks to one of several workforce development initiatives set forth by the City of Milwaukee and supported by Kiewit.

The Residential Preference Program (RPP) promotes the use of city residents who are unemployed or underemployed. RPP requires that 40 percent of the hours worked in the field must be by people who are certified through the program.

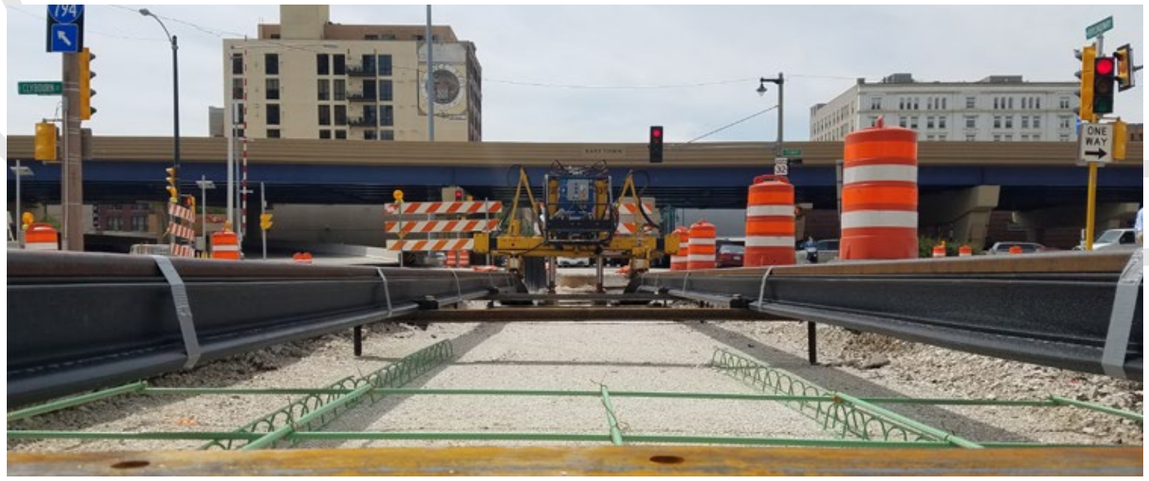
Kiewit has met or exceeded the goal — sometimes reaching 50 percent — throughout the duration of the contract. Equally important as reaching that number is the opportunity to provide new skills to program participants, said Project Sponsor Keith Rahe.

"These tradespeople are working on a project that is going to be there for a long time and that they're going to be able to use and see. If there are extensions to the routes, these people are trained on what streetcar construction is all about and they can continue to do that."

Alexander said he feels pride in knowing that his work will be used every day.

"I'll be able to bring my girls down here and show them what Daddy helped do. I'll actually be driving over the tracks and saying, 'I know how to put rail together.'

"I feel like if I wanted to continue working with these guys or even if I move to a different state, I know that I actually could apply and get hired. I've learned a lot from these guys."



Excavation through critical intersections was often performed on nights and weekends to minimize disruption to traffic.

And while Milwaukee doesn't necessarily bring to mind a New York or Chicago, he said, the underground infrastructure isn't actually that different.

As the team prepared to put in some 200 foundations to support the OCS in the sidewalk, they were frequently looking at drilling through old abandoned floors, ceilings and walls that had been filled in and were now part of the sidewalk. They were never quite sure what would be on the receiving end.

Basements that used to receive deliveries of coal, a parking garage on the site of an old power plant with three stories underground, and spaces now filled with dirt and rubble — all created uncertainties about what was once below.

Ties to Milwaukee's transportation history

Crews installing rails for the Milwaukee Streetcar unearthed a special find in June 2017 — old track from the original streetcar, laid in the late 1800s. More than 125 years later, Milwaukeeans and visitors alike will be riding the rails again this fall. Five sleek, three-piece articulated cars will each have the capacity to carry 150 passengers.

Partnering with Mass. Electric Construction Co.

Mass. Electric Construction Co. is responsible for anything electrical on the right-of-way for the streetcar system. The Kiewit subsidiary has played a critical role this year in frontline infrastructure work.

Mass. Electric is charged with everything involved with the overhead contact system that powers the streetcar, along with traction power, the signal system, street lighting and traffic signals.

They're one of the last stops for items that need to be completed before the system goes online — which includes getting the systems all working, energized, tested and commissioned.

Kiewit couldn't have had a better partner on this project, said Project Manager Mike Ethier. "This being a transit job, it's critical that the system team and civil team is meshed together and integrated really well.

"We need to know their business and they need to know ours. Mass. Electric works closely with the Kiewit team and with a lot of the City of Milwaukee folks who are responsible for the traffic signals and street lights on a day-to-day basis."

"We got to see 100-plus-year-old buildings and then worked backward to figure out how they built them," Ethier said. "That was an interesting technical challenge that we totally didn't foresee, but one that was pretty unique."

ACCEPTING THE RISK

By the time the streetcar goes online this fall, Kiewit will have an estimated 75,000 craft man-hours for its self-perform work, with another 100,000 man-hours worked by subcontractors — with a total of 25 staff and hundreds of craft involved on the project.

It's a prime example of how Kiewit has dug into a first-time endeavor, all the while bringing to bear the team's previous experiences and bank of knowledge. And knowing that this infrastructure isn't going away gives Ethier and others a sense of satisfaction.

"This is a great model reputation project for Kiewit and the city took a little bit of a risk by choosing us," he said. "We're sharing the same goal of delivering this the best possible way to show the state of Wisconsin that the city did right to go and build this system. In the big picture sense, we've all been working toward that."

Gellings said the local community has a lot of respect for Kiewit because "they know their stuff."

"They've got a great team. You can tell a lot of these people have worked together in the past and they're extremely dedicated to what they do. The time they put in, the extra effort they're willing to make to make sure the client's needs are met — it's really been a pleasure to work with them."

WAKING UP
THE INDUSTRY

Kiewit is in a new era — one where construction meets technology. And it's a match that was long overdue.

While other industries were making huge strides in increasing productivity with technology, the construction industry was showing little interest. Kiewit was no exception. The company was wildly successful but projects were getting bigger and more complex. They relied heavily on paper, spreadsheets and decisions based on gut instinct and the last month's numbers.

It all changed in 2009 when Chairman and CEO Bruce Grewcock visited the site of a billion-dollar project. He saw a 1,500-page, double-sided cost report sitting on the project manager's desk and decided then and there that there had to be a better way. Shortly thereafter, the technology transformation began.

Grewcock asked Kiewit's senior leaders to assign some of the best operations people they had to the technology initiative. He knew from the start that any technology, either bought or built, would be successful only if it could improve on how Kiewit builds work using its proven fundamentals.

Kiewit started by identifying the best estimating and enterprise resources planning (ERP) systems available.

It started as a technology initiative and quickly morphed into something much larger, with standard cost codes, consistent tools and common processes used across the business, said Project Director Tom Howell, now sponsoring various mega-projects for Kiewit Infrastructure Co.

Jake Macholtz worked with Howell almost from the beginning of the project. He now leads all corporate technology initiatives as vice president of Kiewit Technology.

"Our approach was to design what we needed, buy solutions that would meet our needs and build what wasn't commercially available," Macholtz said. "We kicked off the project in 2010 and five years later, we were running on the most advanced technology available — technology designed by and for the construction industry."

The technology continued to evolve with new applications that put electronic devices and productivity apps into the hands of employees out in the field. Kiewit developed apps to electronically share daily plans, inspect equipment and capture quantities and man-hours.

The system has since grown to include systems and tools to manage every part of Kiewit's business and the entire lifecycle of a project.

It's called the Kiewit Management System (KMS) and it's made up of a combination of third-party and home-grown applications. What makes KMS so special is that everything is integrated, from the estimate to project cost management, procurement, field execution and administration.

The transformation wasn't easy but it was worth it, according to Project Director Eric Thoendel, who was with the technology initiative from the beginning.

"In just a few years, we successfully transformed the company from spreadsheets and paper-based processes into a streamlined electronic capture and delivery machine capable of serving up the real-time data needed to make faster, better decisions," he said.

John Jennings, president of Kiewit Power Constructors Co., agreed, adding that in addition to the savings realized with the elimination of paper timecards, requisitions and documentation, Kiewit projects now have real-time access to data to help manage operations.

It's led to better reporting, said Jennings, and with better reporting, clients have more confidence that Kiewit can:

- Accurately know the status of projects
- Identify issues earlier
- Leverage lessons learned across Kiewit for the benefit of the project
- Improve processes as problems are solved

"We are doing collaborative information sharing with our clients, including design models, document transmittals, issue identification and tracking," Jennings said. "On EPC (engineer, procure, construct) projects, this has allowed us to shorten our design schedules."

Kiewit is also using technology to capture the education, experience, training and qualifications of staff. Having this information electronically available helps managers plan staff recruiting and career development and to fill roles on upcoming projects.

Technology solutions at Kiewit are all fully integrated, providing unprecedented access across the organization. That translates into an improved ability to consistently deliver projects on time and on budget.

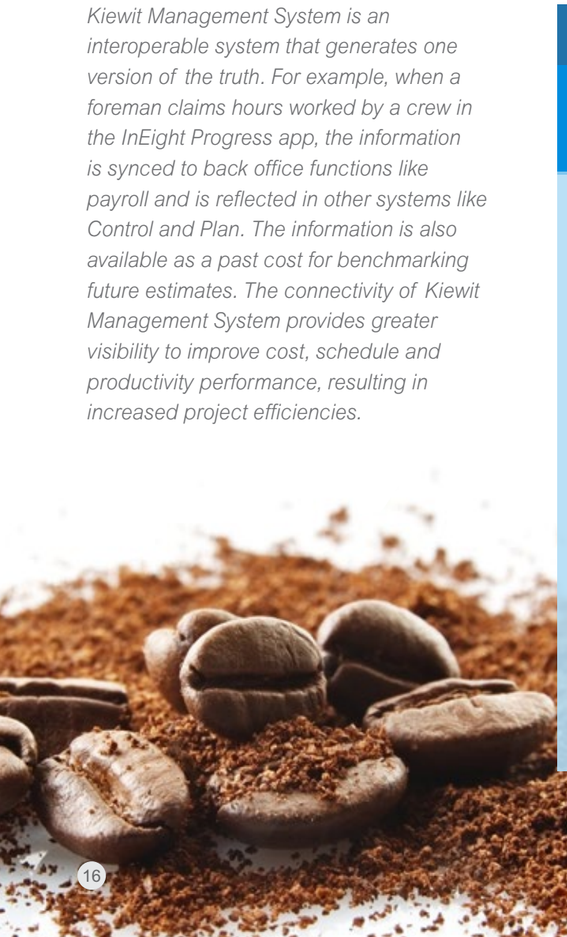
PROVEN RESULTS

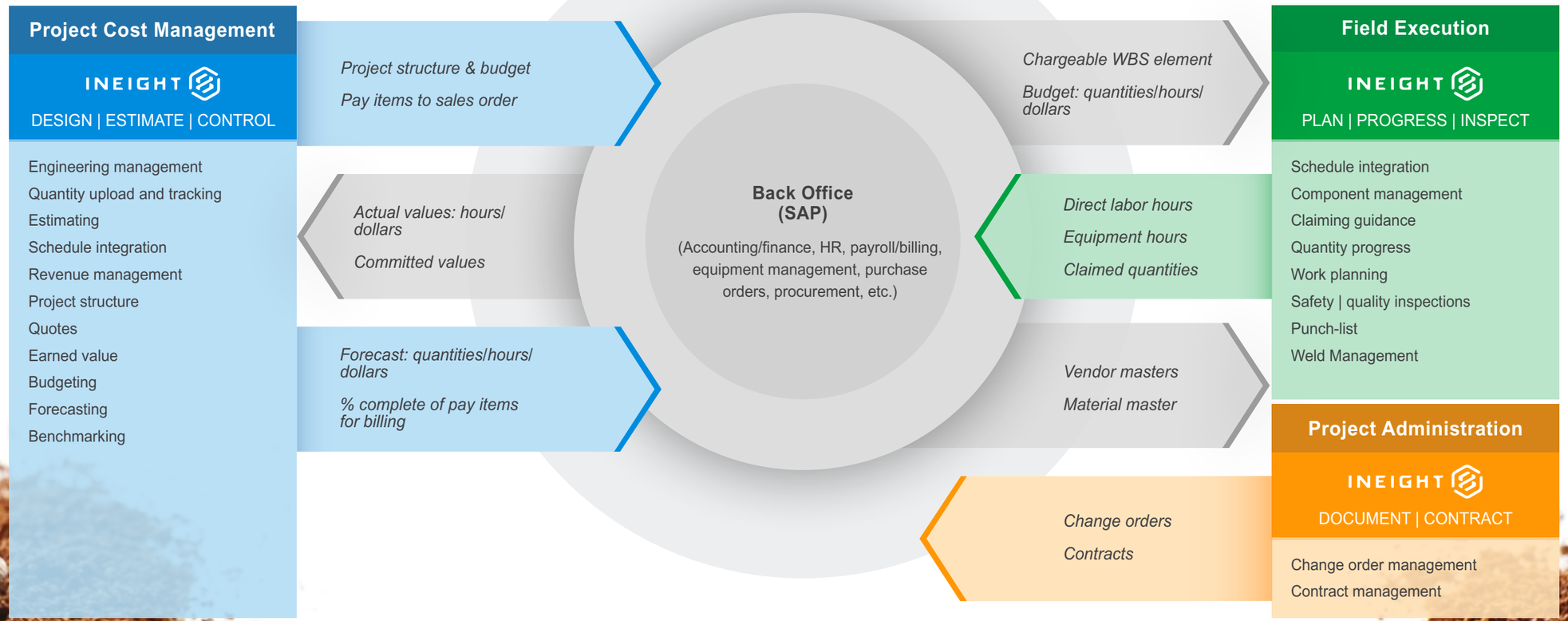
Kiewit project teams are now spending less time creating daily plans, claiming quantities and filling out reports and more time in the field where they are needed most. Management is spending less time crunching numbers and analyzing reams of outdated information.

Kiewit Management System

Powered by InEight

Kiewit Management System is an interoperable system that generates one version of the truth. For example, when a foreman claims hours worked by a crew in the InEight Progress app, the information is synced to back office functions like payroll and is reflected in other systems like Control and Plan. The information is also available as a past cost for benchmarking future estimates. The connectivity of Kiewit Management System provides greater visibility to improve cost, schedule and productivity performance, resulting in increased project efficiencies.





The estimating process is more efficient and accurate, leaving estimators more time to think about schemes than ever before.

"With quantity tracking, our ability to know where we're at on a project is leaps and bounds better," said Macholtz. "Our data gives us the ability to recognize projects in trouble earlier and do something about it before it results in job losses."

Consistency across all projects is another win. "We're all managing to the same account codes, which we didn't do in the past," Howell said. "It's more visible, more transparent to everyone what's happening on projects because of this one product, one approach from top to bottom."

Kiewit is still in the process of implementing the latest technology on all projects but is already seeing dramatic results, as shown below.

14% **improvement** in estimating costs

18% **improvement** in equipment utilization

7% **improvement** in field productivity

5% **improvement** in total company staff productivity

"Technology used to be viewed as a cost to be minimized, but now it's seen as an investment in our future, no different than our equipment fleet is an investment in our ability to build work," said Macholtz. "This is a wholesale mind shift."

WHAT'S NEXT

Kiewit is bringing these powerful, proven technologies to the construction industry through its InEight subsidiary. InEight is a commercial software company with more than 25,000 active users in 750 companies.

InEight is charged with continuously improving the software and works closely with Kiewit and other construction industry leaders to identify new solutions and improve on the existing technology.

"We have powerful, proven project management software that eliminates the guesswork in construction, providing real-time information and insights needed to minimize risks, improve operational efficiency, control project costs and collaborate with stakeholders," said Macholtz. "It's been transformational in helping Kiewit and other InEight clients deliver projects on time and on budget."

Technology today and tomorrow

A few examples of the gains that the company has made since deploying technology to the field in 2012 include:

Estimating costs have been improved by 14 percent *in terms of dollars estimated per estimator hour. Estimating teams have used the standard account codes and historical benchmarking data to improve estimate quality and support estimators spending more time brainstorming better solutions for Kiewit's projects. Standard estimating practices across the company have also enabled estimators to be trained in a streamlined fashion.*

Field productivity has improved by 7 percent *as measured by earned craft hours per spent craft hours. Kiewit teams have used the Plan app to create more than 1.5 million active work plans company-wide and the Progress app to record 81.5 million craft hours in the field. An internal challenge to achieve best costs ever has inspired Kiewit to use standard accounts and display at the project level how their performance stacks up to previous and current projects.*

Equipment utilization has improved by 18 percent. *Kiewit projects electronically submit an average of 20,000 equipment inspections and 21,000 equipment work orders each month. This active data capture, along with the consolidation of the equipment group to a shared service, has provided this gain.*

5%

Total company staff productivity has improved by 5 percent *as measured by company revenue per staff year. Payroll processing time has reduced by 50 percent and the time it takes to process accounts payable invoices for payment has dropped by 30 percent.*

Using the data it has captured, Kiewit is becoming increasingly data-driven. *Projects today have near real-time craft data needed on a weekly basis, which includes updates to productivity and quantities. Today data is becoming predictive data, allowing the organization to identify projects that will encounter schedule or budget concerns, and make more informed decisions about the right projects to pursue.*

As they continue to become more efficient using the Kiewit Management System solutions available to them today, Kiewit teams are becoming more and more savvy at understanding what technology can do for them. Employees are working with a mindset focused on how technology could help them do their job faster or better. As a result, the technology wish list continues to grow.

"We get a constant stream of ideas from Kiewit users and other InEight customers," said Macholtz. "The challenge is to prioritize and resource the new products and enhancements."

Below are just some of the new technologies planned for deployment at Kiewit:

Work packages that are integrated with turnover and quality documents and component quality management

Improved tracking and visibility into construction equipment utilization and cost control

A care and maintenance system for Engineered Equipment that is integrated with design tools and labor/ quantity tracking

Additional tools for virtual reality, 4D scheduling, design and modeling

FROM THE GROUND DOWN

Kiewit Foundations Co. specializes in constructing the parts of a project you'll often never see

When asked to describe what he does for a living in the most basic terms possible, Kiewit Foundations Co. Sponsor Mike Berry doesn't disappoint.

"I dig holes in the ground and fill them up. And that provides the base of everything else that's built."

As simple as it sounds, it's a distillation that helps those unfamiliar with Berry's work begin to understand it, especially since most of what Kiewit Foundations Co. does is never seen once all construction is complete.

"The things you put in the ground that are exposed are few and far between. I've had jobs I spent eight months on and put 10,000 cubic yards of concrete into it, and the job looked the same way the day I got there as the day I left," Berry said.

Out of sight and behind the elementary explanation is work that's dependent on intense technical details, includes a variety of methods and techniques, and requires an advanced and versatile equipment fleet.

ATTENTION TO DATA

Kiewit Foundations Co. segments its business into two types of work: drilled shafts and ground improvements. The drilled shafts team focuses on, of course, drilled shafts, as well as cut off and slurry walls. The ground improvements team performs operations that improve the soil that's already there to reduce settlement and increase bearing capacity, ground strength and liquefaction resistance.

Each requires gathering and analyzing the right technical data to understand what's beneath the project's feet.

"You need a detailed understanding of the geology," said Kiewit Foundations Co. manager Scott Wimmer. "Rock characteristics, soil types, groundwater tables and other geotechnical data help us determine the best solutions and proper equipment and tooling selection."

It's not just the type of data that is important for making decisions. The quantity of data points collected is critical, too.

"We need to have the right number of data points to understand what's there, what's in the ground and how it will behave," said Berry, who manages the drilled shafts side of Kiewit Foundations Co. "If we're working in an area that's 10 square feet, we only need a few data points. An area the size of a football field might require 100."

WHAT'S THE SOLUTION?

After analyzing the data, Kiewit Foundations Co. determines the right methods and equipment to get the job done.

"No one technique, solution, drill or tool is right for every project," Wimmer said. "It's critical that we thoroughly analyze and select the correct techniques, equipment and tooling during the estimate phase. We're always challenging ourselves to find a safer, cheaper and faster solution that meets all the design requirements. As an example, if it meets design parameters, CFA auger cast piles have proven to be cheaper and faster than drilled shafts, and in some cases driven pile."

Increasingly, new industry techniques are taking shape that are more efficient and cost-effective. For instance, Kiewit Foundations Co. is the first contractor in North America

to complete non-vibratory stone columns. Mark Ahrens manages Kiewit Foundations Co.'s ground improvements work and has more than 23 years of industry experience.

"This is very new to the industry. It originated in New Zealand and has been used in Europe for about the past seven years," said Ahrens. "When you get around sensitive utilities or existing buildings you don't have to worry about vibration with this technique. Traditional stone column techniques create vibration where this doesn't."

Another major benefit of non-vibratory stone columns is they don't generate drill spoils, which is cost-effective, especially on sites that may have contaminated soils.

Having the right equipment for every construction technique, old or new, is key.

"A lot of thought goes into what kind of tooling we need and the rig we want to use," Ahrens said.

STAYING ON THE CRITICAL PATH

With a plan in place and specialized equipment in tow, Kiewit Foundations Co. is onsite at the onset of construction. Foundations and ground improvements are the precursor for all of the rest of the work. If this scope isn't planned and executed well, it can disrupt the entire project schedule and its critical path.

To keep projects on time and on budget from the get-go, general contractors need foundations experts on the job who can not only develop a plan based on technical data collected and analyzed in advance, but who can adapt and modify that plan based on the conditions actually encountered once construction begins.

Kiewit Foundations Co.'s origin

Kiewit Foundations Co. builds upon a long history of geotechnical and deep foundations work within the Kiewit organization. A lot of that experience is within the company's underground construction group, which began completing tunneling and geotechnical projects more than 60 years ago. Kiewit Foundations Co.'s staff includes many tenured Kiewit employees, as well as experienced industry hires. As a specialty subcontractor, Kiewit Foundations Co. competes for foundations contracts on Kiewit projects and for other prime contractors across the U.S. in a variety of markets, including vertical building, transportation, wastewater, transmission and power. Within the Kiewit organization, the goal is to help teams realize an advantage from the start, getting involved early to brainstorm and determine the best procurement, design and constructability solutions for the project.

"We've been self-performing foundations for decades. Now we've started our own company and we're working for both Kiewit and other prime contractors," said Matt Swinton, who oversees all of Kiewit's underground construction operations, which includes foundations work as well as tunneling. "We've structured the business with two parts, drilled shafts and ground improvements, and every day we're adding new tools to our tool kit and expanding our capabilities. We're excited to be working on a lot of jobs and growing."

Specialized capabilities

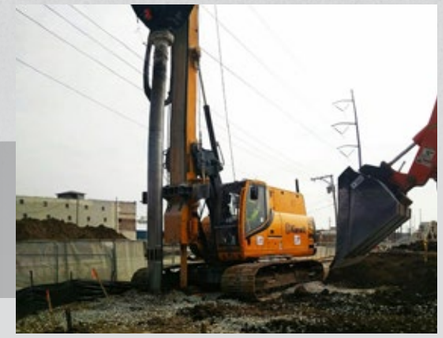
Kiewit Foundations Co. is experienced in many different foundations techniques.

DRILLED SHAFTS

- Drilled shafts for bridges, structures, transmission lines
- Deep drop/vent shafts for tunnels
- Secant pile shafts

GROUND IMPROVEMENTS

- Continuous Flight Augers (CFA) / Augered Cast-in-Place (ACIP) piles
- Displacement piles
- Grout/concrete columns
- Micropiles
- Non-vibratory stone columns
- Vibro compaction
- Grouting
- Soil mixing



CUT-OFF WALLS

- Cut-off walls
- Self-hardening seepage control for dams and levees
- Temporary and permanent water-tight enclosures

STRUCTURAL SLURRY WALL

- Tunnel shafts
- Building foundations
- Open-cut excavation support

The Kiewit Foundations Co. team can also perform load testing and verifications of design assumptions before construction begins, using O-Cell load testing, as well as other compression, lateral and tension testing methods.

A special equipment fleet

You can't compete for and complete specialty foundations projects without a robust equipment and tooling fleet. To deliver the best value to its clients, Kiewit Foundations Co. relies on high quality, versatile pieces of equipment in almost every size and capability, and is continuously improving and adding to its resources.

"We put a lot of thought into what drill rigs we choose to put in our fleet," said Mark Ahrens, who manages ground improvements work for Kiewit Foundations Co. "We want them to be very versatile so we can do anything from drilled shafts, to CFA, to grouted inclusions, to stone columns, to non-vibratory stone columns and soil mixing all with the same rig. A big thing is getting rig utilization out of our fleet."

"When you work in the ground, even with as much data as you've been given and all of the borings and everything else, there are still a lot of unknowns," said Berry. "Having the people who have the knowledge to make changes in the field regarding the way we're approaching a project — or to know what to do when the ground gives you something that you didn't expect — is key to keeping the work moving forward safely and efficiently."

Berry explains that Kiewit Foundations Co. has a natural advantage when the unexpected happens because it doesn't just specialize in one technique. The team has experience in a wide array of geotechnical construction methods and a $9 billion parent company with more than 130 years of construction experience to back it up.

"Because we've got a bunch of different techniques we look after and a bunch of different people with different knowledge bases, we're not thrown when something changes. We're very quick to adapt and overcome."

GETTING OUT OF THE GROUND

Once foundations and ground improvements are complete, above-ground work can begin. Out in the open with increased visibility, things theoretically get a little easier on construction crews.

"Once you get out of the ground, everything is in front of your face. There are very few unknowns left," Berry said. "The project is in your control and you have more ability to influence it."

Similar to how he describes what he does for a living, Berry has a pretty simple explanation for Kiewit Foundations Co.'s role in getting Kiewit and other prime contractors to this point in their projects.

"It's important to have a contractor or a part of your business that can make sure you get out of the ground in the quickest and most efficient manner possible."