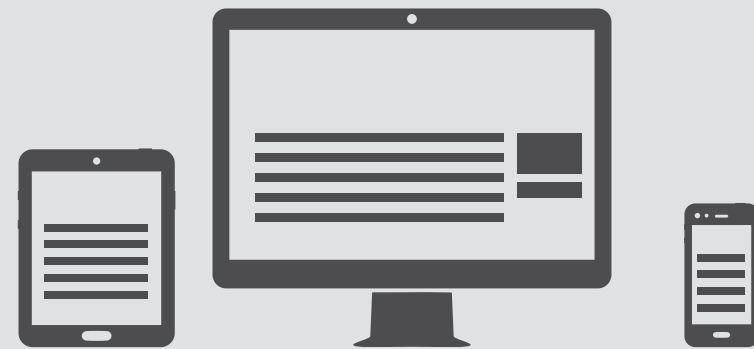




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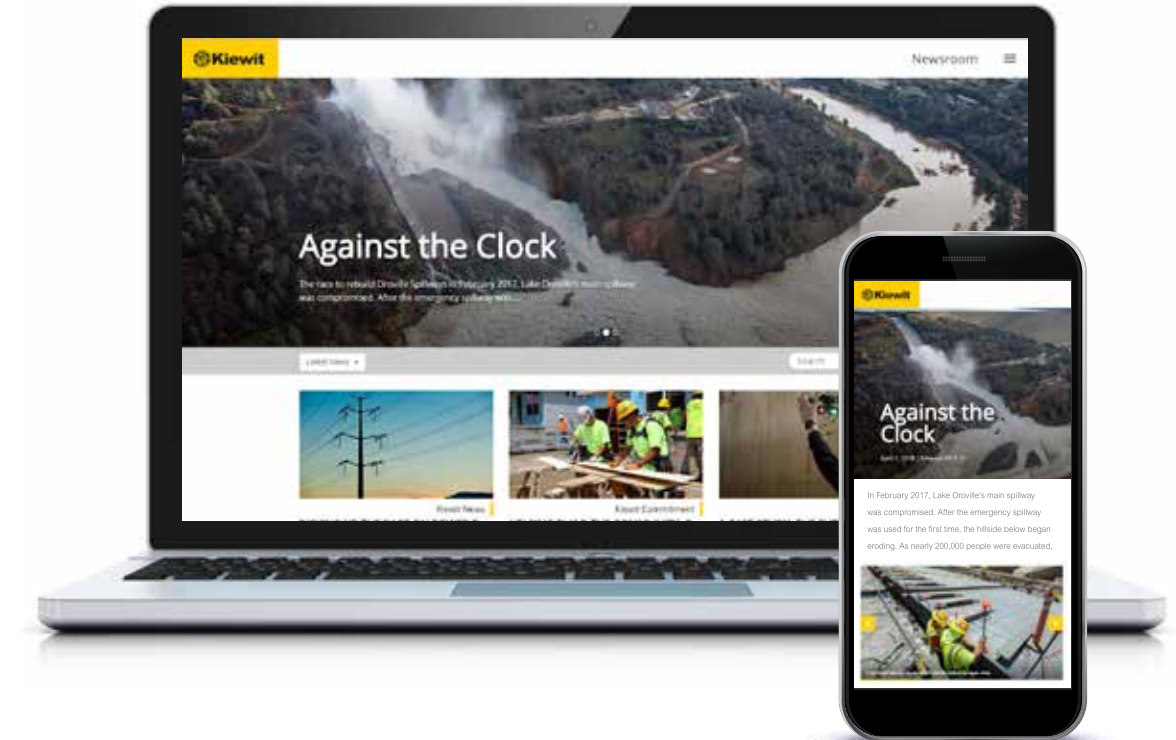
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KIEWAYS



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Special edition: double-cover issue

This special edition of Kieways includes two covers. The first features one of Kiewit's summer interns, Maddie Johnson, and the second, Lackawanna Energy Center, the largest natural gas-fired power plant Kiewit has ever built. Each represents something exciting about Kiewit worth sharing with readers. From the energy and vigor new generations of employees inject into the organization, to the scope and scale of work Kiewit people are able to accomplish. Read more from some of this year's interns on Page 10, and the accomplishments of the Lackawanna team on Page 18.

Fold over for Lackawanna Energy Center



KIEWAYS



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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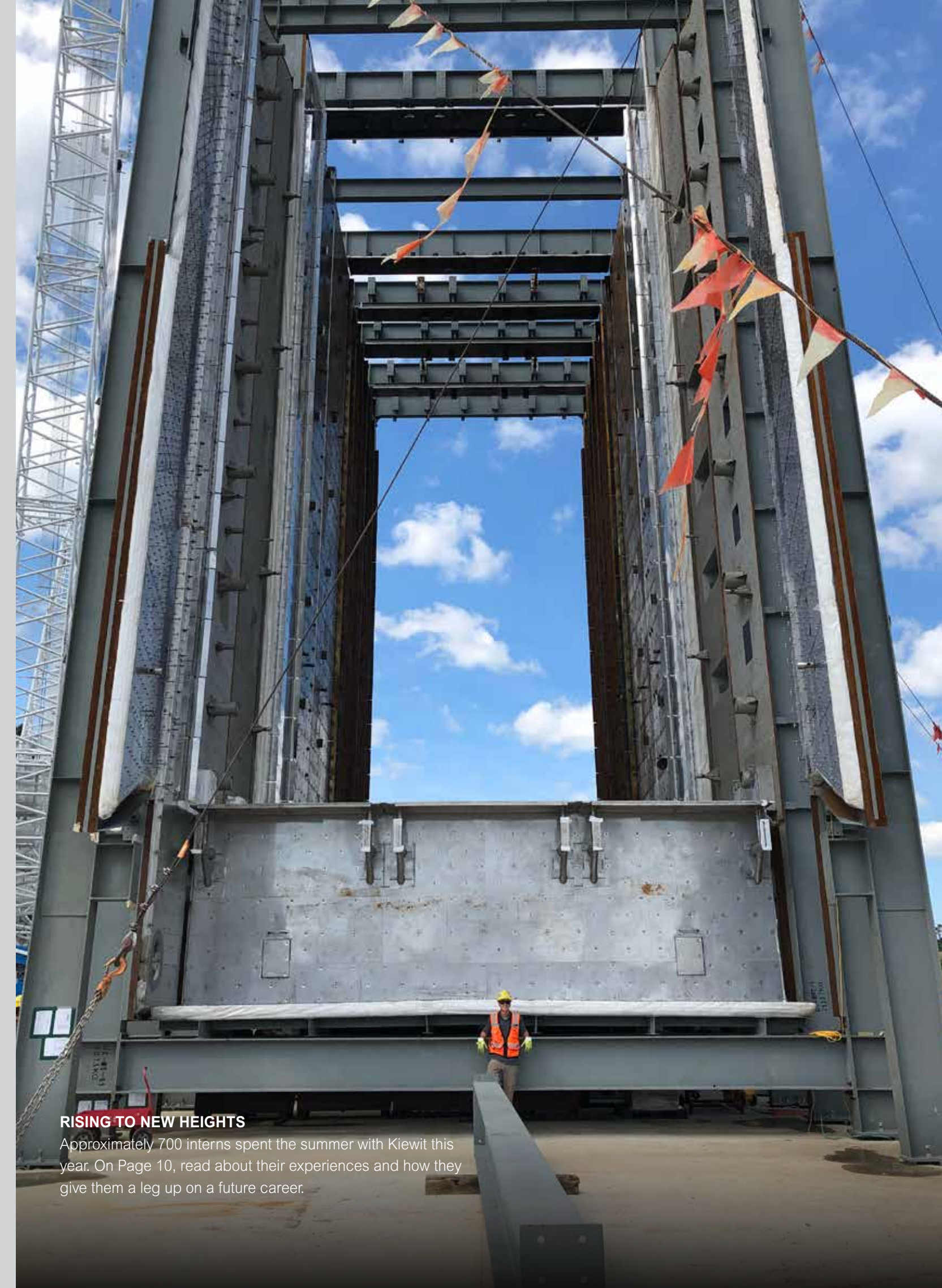
KIEWAYS

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RIISING TO NEW HEIGHTS

Approximately 700 interns spent the summer with Kiewit this year. On Page 10, read about their experiences and how they give them a leg up on a future career.



OUR NUMBER ONE RESOURCE

As you flip through these pages every quarter, you'll see lots of examples of the diverse and iconic projects Kiewit builds. There are plenty of reasons for our company's success — everything from our willingness to go where the work is to our fundamental best practices that have stood the test of time. But you'd be hard-pressed to find one Kiewit leader who would disagree on our most important resource — our people.

In this issue, you get a really good sense of Kiewit's commitment to developing people in the many quotes from some of our 2018 summer interns, beginning on Page 5. Kiewit's internship program puts future leaders right in the center of the action, from a \$1.2 billion highway reconstruction project outside of Dallas/Fort Worth International Airport (Page 6) to the Lackawanna Energy Center project in Pennsylvania (Page 18) — a huge, natural gas-fired generation station that is breaking new ground in technology.

On Page 12, you'll see how our people are also working to provide clean, dependable water supplies across North America, as well as keeping water out of communities like New Orleans, Louisiana, and Oroville, California.

There's a lot of institutional knowledge on our jobs, and the most important thing we can do is pass it on to future generations. We can show you photos and write about the impact these projects will have on our communities, but nothing showcases the enormity of Kiewit's work like the pride and excitement from those contributing to it for the first time. It's contagious.

BRUCE GREWCOCK
Chairman and CEO



WATER WORKS

Across the U.S., Kiewit crews are helping improve the country's aging and insufficient water and wastewater infrastructure. More on their efforts on Page 12.

ON THE COVERS

10 **INTERNS OF KIEWIT**
Many Kiewit careers start as internships. Meet a few of this year's interns.

18 **MAKING ELECTRIC HISTORY**
The Lackawanna Energy Center is set to become the largest natural gas-fired power plant ever built by Kiewit.

ALSO INSIDE

04 **KIEWIT NEWS**
Catch up on recent news from across Kiewit.








06 **CLEARED FOR COMPLETION**
Kiewit crews finished another phase of the DFW Connector project in Texas.

12 **WIDE WORLD OF WATER**
Kiewit teams are helping provide communities a clean and reliable water supply, and protecting them from water's devastating effects.

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

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LAYING A FOUNDATION FOR CONSTRUCTION CAREERS

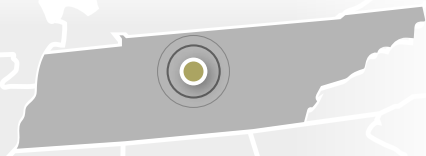
In New York City and Kansas City, Missouri, Kiewit employees joined local organizations to support summer programming aimed at introducing young women to careers in construction.

Employees volunteered for the first-ever Tools & Tiaras summer camp in New York City. Tools & Tiaras, founded by a local union plumber, was formed to expose young women to opportunities in the construction industry's skilled workforce. Several Kiewit projects donated tools and materials to help make the workshop possible, and employee volunteers enjoyed speaking with the attendees about their interests and possible careers.

The local National Association of Women in Construction (NAWIC) chapter held Camp NAWIC in Kansas City, a unique summer camp designed to introduce high school girls to the construction industry. Several Kiewit employees volunteered and helped develop the week's agenda, including a jobsite tour of a power plant constructed in part by Kiewit Power Constructors.

WATER WIN

Kiewit Infrastructure South crews will upgrade a water reclamation facility in Franklin, Tennessee, following the award of a \$133 million contract. The upgrades will increase the facility's capacity by 33 percent. This project is an example of Kiewit's continued growth in the water and wastewater infrastructure market, which you can read more about on Page 12.



OPENING DAY FOR COLORADO VETERANS

On July 27, the Rocky Mountain Regional VA Medical Center in Aurora, Colorado, opened for outpatient services, followed by the transfer of in-patient veterans from the former hospital on Aug. 4. Kiewit Building Group Inc. President Joe Lempka joined local veterans, representatives from the U.S. Army Corps of Engineers, U.S. Department of Veterans Affairs, and Turner Construction, and elected officials to celebrate the project's completion in a ceremony held in July.



A DAM GOOD SUCCESS

BC Hydro, First Nations groups and Kiewit joined to mark the completion of riprap upgrades to British Columbia's WAC Bennett Dam in August. Peter Kiewit Sons ULC Senior Vice President Ryan Tones and BC Hydro President and Chief Operating Officer Chris O'Riley each commented on the important role of early contractor involvement (ECI) in the project's success. O'Riley and Tones also recognized First Nations groups for their integral contributions to the project. You can read more about this milestone at Newsroom.Kiewit.com.



MIDTOWN MILESTONE

SouthGate Constructors, a joint venture of Kiewit Infrastructure South and Austin Bridge & Road, placed the last of 1,869 bridge beams on the Midtown Express project on June 25, bringing it closer to completion. The \$850 million Texas Department of Transportation (TxDOT) project spans more than 27 miles and includes reconstruction of frontage roads and general purpose lanes, and new construction of a toll-managed lane in each direction.

KIEWIT EMPLOYEE HONORED AS INDUSTRY LEADER

Suzanne Motica, director of product management in Kiewit's Technology Group, was recognized as a leader in the construction industry as part of Constructech's 2018 Women in Construction awards. The award honors successful women in construction leading projects and driving technology adoption at their companies. Motica has been influential in developing and delivering Kiewit's technology strategy to help teams complete construction and engineering projects on time and on budget.



INTERNS OF KIEWIT

Each year, the Kiewit organization hires nearly 700 interns for positions in offices and on projects across North America. They take on a variety of tasks and responsibilities and are important contributors to Kiewit's business. Here are a few snapshots of Kiewit intern experiences from this summer. Read more on Page 10.



Kaylyn Jorgensen (Northern Arizona University)
— Proposals, Arizona



Will Bodnar (University of Pittsburgh)
— Bay Bridge Suspension Span Rehab, Maryland



CLEARED FOR COMPLETION

No metropolitan area in the United States took on more new residents in 2017 than Dallas/Fort Worth. The area known as the Metroplex added 146,000 newcomers, according to the U.S. Census Bureau. A region that had slightly more than 7 million people in 2015 is expected to grow to more than 16 million by 2050.

This growth has meant the need for two things: more roads and the resources to pay for them. Texas voters made this statement clear when they overwhelmingly voted in favor of two ballot propositions to direct certain tax revenues to the state highway fund.

The state responded by setting up the Texas Clear Lanes initiative to allocate funding for needed highway improvements that would relieve traffic gridlock in the state's largest metropolitan areas.

And a Kiewit project was the first beneficiary of Texas Clear Lanes, with the first \$61 million of the funding tapped for reconstruction of the interchange of two major state highways, SH 121 and SH 360, in Grapevine.

The SH 121/SH 360 interchange was Kiewit's third extension related to the DFW Connector, a \$1.2 billion reconstruction of the network of highways on the north side of Dallas/Fort Worth International Airport. The new interchange will carry more than 168,000 cars per day.

A NEW CHALLENGE

"Once funding was identified for congestion relief, (the SH 121/SH 360 Interchange) was our first choice to add back into the project," said Joel Mallard, Project Manager for the Texas Department of Transportation (TxDOT) Fort Worth District. "By reconstructing this interchange, we are able to separate traffic movements, which in turn cuts down weaving and merging."

The new interchange was necessary because SH 114, SH 121 and SH 360 came together in a span of roadway of little more than a mile. State Highway 360 met its northern terminus at State Highway 121, with two lanes of traffic merging onto the highway from the right to go with the three lanes already coming north on SH 121.

And just ahead, those two merging lanes became exit lanes for a ramp connecting to State Highway 114. This meant motorists merging on and off SH 121 needed to cross in front of each other, and this "weaving" created a traffic hazard that TxDOT was eager to address.

EARNING THE WORK

The seeds for the SH 121/SH 360 Interchange project — and Kiewit receiving the work — were sown through a successful completion of the main DFW Connector construction and the first two additions to it. Those included the reconstruction of FM 2499 at the north of the DFW Connector and the construction of new ramps leading local traffic onto State Highways 121 and 360 on the southwest edge of the DFW Connector.

After four years of work on the main DFW Connector project, Kiewit completed these additional projects in less than two years.

"That gave TxDOT another occurrence where we could finish a project quickly, which was a key to some of the Texas Clear Lanes funding," said Tom Grim, Project Director for NorthGate Constructors, a joint venture of Kiewit and Zachry Construction that completed the Connector projects.

The new configuration allows motorists coming north on SH 360 to bypass SH 121 entirely to get on SH 114 via a new ramp, while another new ramp on northbound SH 121

Paving the way forward

The SH 121/SH 360 Interchange project team embraced the mentality of teamwork and serving Kiewit more broadly with the development of a mobile concrete paving crew. The Paving Division, as it calls itself, handled all the concrete paving work on the DFW Connector and sub-projects, and the team also handled paving work outside of North Texas on key projects. In addition, members of the Paving Division were sent to projects outside the region to share best practices with those teams.

“We are team players and we are willing to help across the company, no matter what is being built,” said Derek Arrant, paving superintendent. “We are all striving for the same goal: to make Kiewit the best.”

Here is a list of other projects the DFW Connector Paving Division assisted with during the life of the 121/360 Interchange project:

In Texas:

- DFW Connector (main project)
- FM 2499
- SH 121/SH 360 Ramps
- Midtown Express (SH 114/SH 183)

In Arkansas:

- I-540
- Razor Rock Ridge
- Hawg Wild Highway
- Porter Road
- Stagecoach Ramps
- Hwy 391 Interchange
- Bryant Ramps

Outside the region:

- Turcot (Montreal, Quebec)
- Project Neon (Las Vegas)
- Paseo Del Norte (Albuquerque, New Mexico)



takes motorists directly to SH 114 before the merger with SH 360. These two new ramps eliminate the weaving.

NorthGate broke ground on the project in August 2016 and completed the work seven months ahead of schedule in April 2018, thanks in part to including the project in its original design-build bid for the DFW Connector. The project was ready to begin once TxDOT secured the funding.

NorthGate maintained a strong working relationship with TxDOT through the DFW Connector project and the first two additional projects, and in addition was able to carry over most of the main subcontractors who supported the projects onto the SH 121/SH 360 interchange.

As a result, all of this work has been secured under one contract since October 2009. An additional project, for the \$371 million reconfiguration of the SH 121/Interstate 635 interchange north of the DFW Connector, is next on tap.

A WIN FOR THE PEOPLE

In addition to the efficient reconstruction of the SH 121/SH 360 Interchange, the story is also one of success for Kiewit’s employees.

Several craft employees on the interchange project have gone into Kiewit’s development program to become foremen or superintendents. In addition, four members of the team started as engineers or foremen and have since become project superintendents.

“One of the biggest things I’m proud of is the people development,” said Ryan Keller, deputy project director for NorthGate. “That development was a focus of the team. Even though it was just an extension project, we were able to bring new people onto the team and develop them.” 🙌

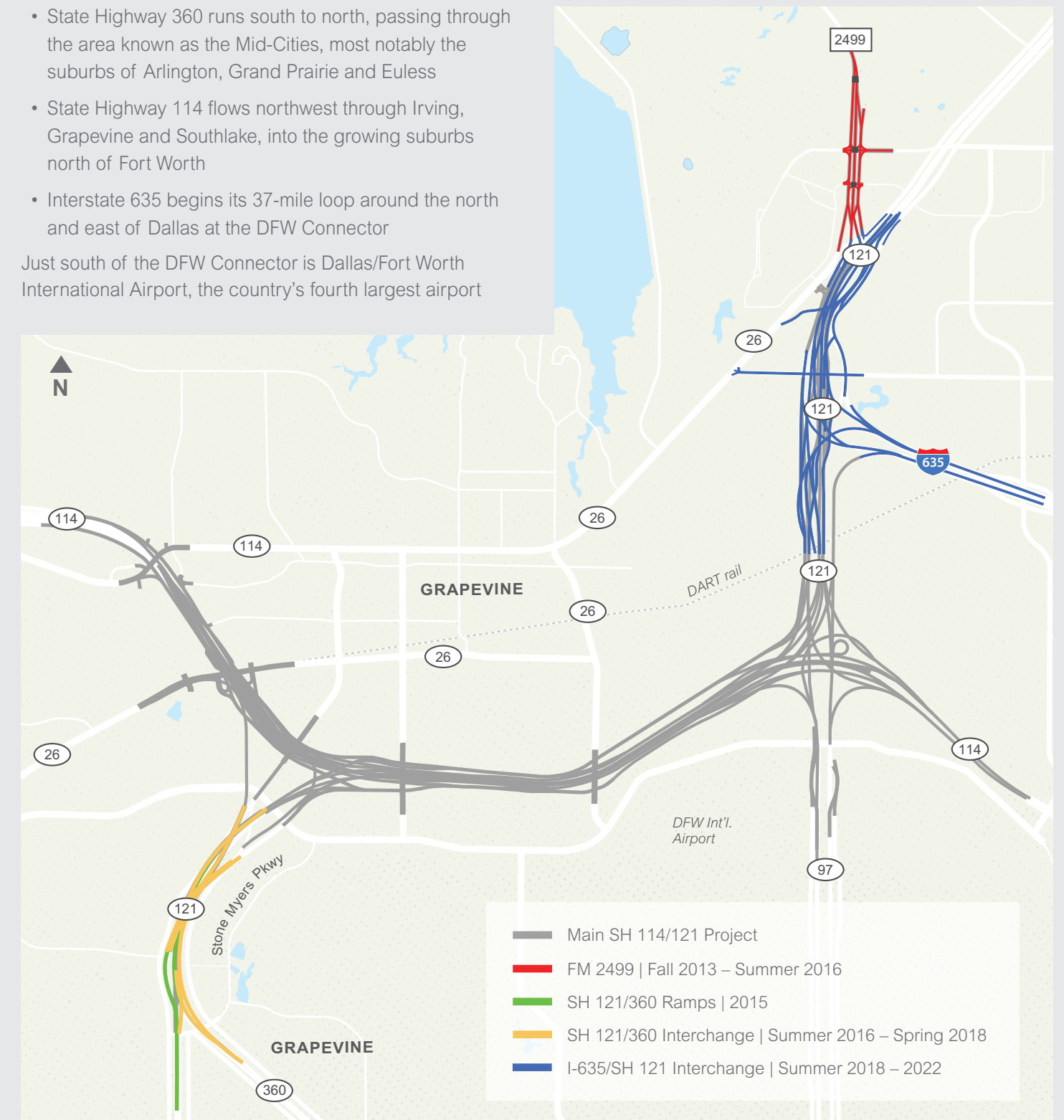
DFW Connector

The DFW Connector sits at the confluence of four major routes in the Metroplex.

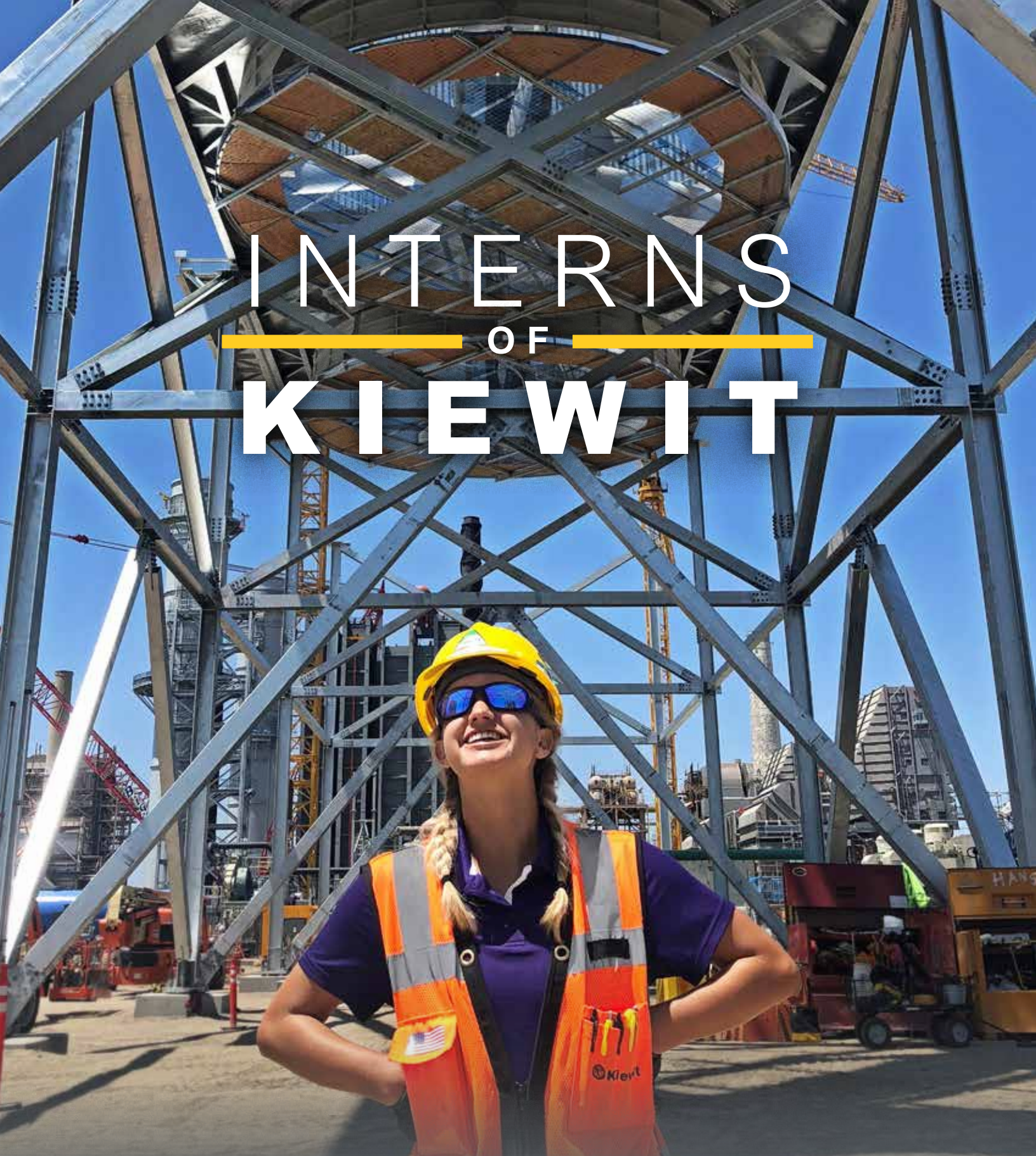
- State Highway 121 runs southwest to northeast to connect downtown Fort Worth with the fast-growing northern Dallas suburbs in Collin County
- State Highway 360 runs south to north, passing through the area known as the Mid-Cities, most notably the suburbs of Arlington, Grand Prairie and Euless
- State Highway 114 flows northwest through Irving, Grapevine and Southlake, into the growing suburbs north of Fort Worth
- Interstate 635 begins its 37-mile loop around the north and east of Dallas at the DFW Connector

Just south of the DFW Connector is Dallas/Fort Worth International Airport, the country’s fourth largest airport

by passenger boardings and the largest hub for American Airlines. And all around it lie major city streets that handle heavy daily volume, including Farm-to-Market (FM) 2499 in Grapevine and Flower Mound; State Highway 26 through Grapevine and Colleyville; and FM 1709 through Southlake.



INTERNS OF KIEWIT



Maddie Johnson — Alamos Energy Center, California
University of Nebraska–Lincoln

"Both of my internships with Kiewit have been led by female superintendents. Having a role model display the way women are empowered in a mostly male industry has inspired me to pursue and grow in my passion for engineering. These women, as well as the men on my team, have provided tons of support, encouragement and inspiration about how to be a strong woman in this field."



Jack Petersen — Buckskin Mine, Wyoming
University of Utah

"Right away, I was able to observe the commitment of Kiewit's employees at Buckskin to [our shared] core values, when a burrowing owl's nest was discovered near where we were going to remove topsoil for stockpiling ... With some creative thinking, we were able to adapt and change our mine plan such that the mine was able to continue making progress while leaving the owl undisturbed — a true win-win situation, and an excellent example of Kiewit stewardship, excellence and integrity in action."



Colton Meisinger — UHWO Creative Media Facility, Hawaii
University of Nebraska-Kearney

"Being a part of Kiewit and moving to Honolulu, Hawaii, to assist in the Creative Media Facility design-build project for the University of Hawaii West Oahu has come with nonstop challenges. Whether it's constantly tracking design changes, meetings with the owner, or taking Sunday phone calls from subcontractors while on a boat in the middle of the ocean, it has been a never-ending adventure this summer at work and outside of work."

Brian Cianciolo — OGC Engineering, Houston Energy Corridor
Texas A&M University

"Although office environments don't feature the grand machinery and materials that job sites do, they still contain Kiewit's most important element: people ... My submission illustrates Kiewit's need for collaboration to achieve a common goal. No set of hands in the photo is indicative of a department or job title to show that no matter the employee's responsibility, teamwork is essential."



WIDE WORLD OF WATER

Showering. Cooking. Flushing the toilet.

Pollution. Floods. Broken water mains.

Water. It enables life's most vital daily activities, but left untreated or uncontrolled, causes havoc.

The infrastructure Americans depend on to manage the flow of water into, out of, and away from their communities is in need of repair. On its 2017 Infrastructure Report Card, American Society of Civil Engineers (ASCE) graded American drinking water a D, dams a D and wastewater a D+.

Not only is existing water infrastructure missing the mark, new infrastructure is greatly needed due to population growth and stricter Environmental Protection Agency (EPA) regulations.

With decades of experience in the water infrastructure market, Kiewit companies are helping water municipalities and other state and federal agencies make the grade as the number of these projects climbs across the country. Kiewit employees are improving infrastructure and helping provide people a clean, dependable water supply, and protecting them from water's potentially devastating impacts.

DRINKING WATER

Clean drinking water is a basic human necessity. In the U.S. it's used for everything from cooking and bathing to manufacturing.

The U.S. uses **42 BILLION** gallons of water every day.

Drinking water is delivered to homes and businesses through **1 MILLION MILES** of pipe, many of which are nearing their lifespans of 75 to 100 years.

It is estimated that leaky, aging pipes are wasting **14 TO 18 PERCENT** of each day's treated water.

\$1 TRILLION is needed to maintain and expand water infrastructure to meet the water supply demands over the next 25 years.

More than 240,000 water main breaks occur each year, which waste a total of **2 TRILLION GALLONS** of treated drinking water.

The amount of clean drinking water lost every day could support **15 MILLION HOUSEHOLDS.**

By 2032 it is expected that 56 million more people will connect to centralized treatment plants, rather than private septic systems — a **23 PERCENT INCREASE** in demand.

95 PERCENT of spending on water infrastructure is made at the local level, and wastewater treatment is typically overseen by a community utility or public works department.

Wastewater enters the treatment system from households, businesses and industries through over **800,000 MILES** of public sewer lines and **500,000 MILES** of private lateral sewers that connect private property to public sewer lines.

\$271 BILLION is needed by 2032 to meet wastewater infrastructure demands of 532 new treatment systems.

76 PERCENT of Americans rely on the nation's **14,748 TREATMENT PLANTS** for wastewater sanitation, while the rest rely on private septic systems.

Wastewater removal and treatment is critical to protect public health. Processes reduce toxins that cause harm to humans and pollute water.

WASTEWATER

A REBOUNDED MARKET

When the recession settled in around 2008-2009, the water infrastructure market felt the hit.

"Many water infrastructure projects are often driven by capacity and new development," said Kiewit Infrastructure West Co. Senior Vice President Matt Scott, who has 25 years of experience working on water and wastewater projects with Kiewit. "Because of the recession, there were fewer new suburbs and houses built, so there wasn't a need to grow capacity. It also limits the tax base for funding, so a lot of wastewater upgrades were delayed."

As the economy recovered, so did the water and wastewater project market. According to the Water Design-Build Council (WDBC), "U.S. water and wastewater utilities spend \$40 to \$50 billion a year to upgrade, rehabilitate, replace and expand their water and wastewater infrastructure." WDBC anticipates spending will continue to increase, amounting to over \$60 billion annually by the end of the next decade.

For Kiewit, which has worked on more than 500 water infrastructure projects in the past 15 years, it's an exciting time.

Over the past 15 years,
Kiewit has worked
on more than

500

water and wastewater
infrastructure projects,
totaling more than

**\$8.3
BILLION.**

FROM SOURCE TO TAP AND BACK

A lot of infrastructure is needed to treat and deliver drinking water and treat wastewater so that it can be returned back into the ecosystem. When you turn on the tap at home, the water has traveled from a source — a river or even the ocean via a desalination plant — to a treatment facility. It's then held in a reservoir before it flows through water supply pipes and into your house.

Once the water is used — to wash clothes, brush your teeth or do the dishes — the wastewater travels through sewage pipes and makes its way to a treatment plant to be cleaned before it is put back into the ecosystem along with storm water runoff.

Kiewit people have the experience and skills to build all of the infrastructure involved in the process.

For example:

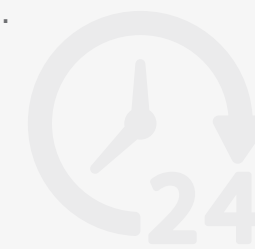
- In the past five years in California, crews have worked on two desalination plants, 50 miles of water supply pipe and 23 wastewater treatment plants.
- In New York, Kiewit Shea, AJV is working for the New York City Department of Environmental Protection to build a bypass tunnel for the leaking Delaware Aqueduct, which supplies nearly half of New York City's water.
- Across the Southeast and Mid-Atlantic, crews are focused on working with clients to upgrade water treatment facilities.

Tom Trimble, an area manager with Kiewit Water Facilities South Co., has worked for Kiewit for 26 years and on many water infrastructure projects. He helps manage efforts to pursue and build these projects, which require many different areas of expertise.

"Every treatment plant that we build, whether expansion, new or retrofit, you almost always have demolition, earthwork, concrete, underground pipe, above-ground pipe, mechanical equipment installation, electrical and startup and commissioning," Trimble said. "You need a staff that's knowledgeable about all of these types of work and a diverse craft workforce. What makes Kiewit positioned so well in this market is that we have that expertise within our company and can self-perform much of this work and control our own destiny."

An on-call crew

In Georgia, Kiewit Water Facilities South Co. has three on-call maintenance contracts. When an emergency happens at a water treatment facility, like a burst pipe, Kiewit crews answer the call to fix it. They also support the water agency's staff to conduct routine maintenance.



55,000+

According to the Water Design-Build Council, there are more than 16,000 water and wastewater entities and more than 55,000 water systems in the water and wastewater industry. Alternatively, Kiewit's transportation, power and oil, gas & chemical markets include fewer, larger owner and clients.



Water and wastewater interns of Kiewit



Jason Buechlein, Purdue University

"I got to learn a lot on this job, starting with our underdrains crew before moving on to the roller compacted concrete (RCC) batch plant. ... Working with the batch plant I got my first taste of plant work, which involved quantity tracking ... I also was able to learn how the plant operates and even how to run the plant from the driver's seat. After moving to the anchors crew, I dove deeper into cost and quantity tracking while also learning a lot about grout plants and pull tests."



Hiram Fernandez, Texas A&M University

"It's impossible to ignore how experienced and hardworking everyone on this team is. I get to work with superintendents, engineers, foremen and craft, and I really get to learn something new from them every day. I'm just glad and proud of being part of such a team!"

Nearly
60
PERCENT
of Kiewit's water
infrastructure projects
since 2002 have an average
contract value less than
\$10
MILLION

PREVENTING WATER'S FURY

While some Kiewit teams help bring water into and out of communities, others are making sure it doesn't harm them.

Residents of New Orleans, Louisiana, and Oroville, California, know all too well how much destruction water can cause when it's out of control. In 2005, Hurricane Katrina killed more than 1,400 people, many in New Orleans. In 2017, erosion was discovered on the lower chute of the main flood control spillway at Lake Oroville. With an onslaught of winter storms, releases down the damaged main spillway were unable to prevent the reservoir from overtopping the concrete weir. Water cascaded down the emergency spillway, triggering the evacuation of more than 180,000 people downstream of the lake.

After both of these natural disasters, Kiewit helped make repairs.


Partnering with other construction companies, Kiewit completed the Gulf Intracoastal Waterway (GIWW) West Closure Complex and Permanent Canal Closures & Pumps (PCCP) projects, each part of the U.S. Army Corps of Engineers \$14.5 billion Hurricane and Storm Damage Risk Reduction System (HSDRRS) following Hurricane Katrina. Collectively, HSDRRS will protect southeast Louisiana from a 100-year level storm surge.

In Oroville, work is ongoing to upgrade the main and emergency spillways. Crews are on schedule to complete the project on time later this year, and the new spillways will feature thicker slabs and walls, drain pipes, and slab anchors.

WORK THAT MATTERS

Even as Kiewit delivers more than 30 water infrastructure projects each year, the sense of pride felt by employees never wanes.

Carey Allen, senior vice president and business line manager for Kiewit Water Facilities South Co., has worked for the Kiewit organization for more than 15 years. Being a part of the nation's efforts to improve infrastructure, and to deliver and treat water safely, is something she takes great pride in.

"It's really an honor to be part of this work at Kiewit," Allen said. "To think about all of the tens of thousands of clients in the water industry and all of the populations that need clean drinking water and their wastewater treated, to be part of that process is pretty outstanding." 



RM Clayton

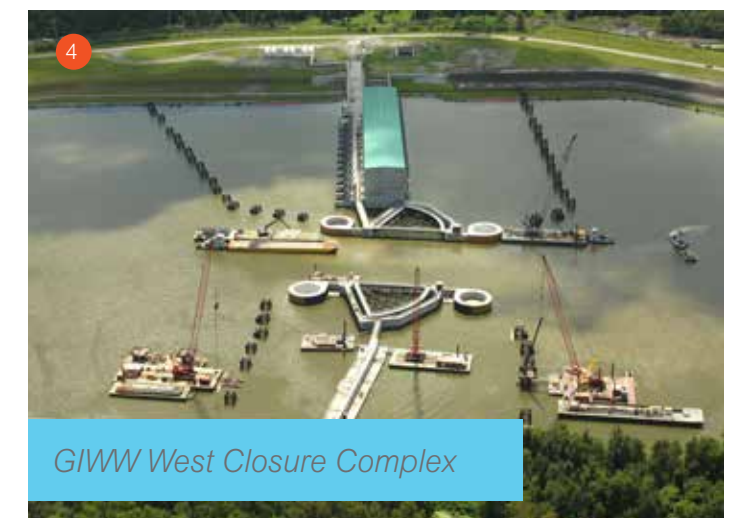


Upper Stone Canyon



Lahaina Wastewater Reclamation Facility Modifications Stage 1A

1. This design-build rehabilitation project on the City of Atlanta's largest wastewater treatment plant solved a grit-removal issue. The project was completed early and recognized with a National Award of Merit from the Design-Build Institute of America (DBIA). 2. The existing Upper Stone Canyon Reservoir is being modified to comply with water-quality regulations by placing a 700,000-square-foot floating cover over the reservoir. 3. Modifications to the Lahaina Wastewater Reclamation Facility in Hawaii must be completed without interrupting plant operations and will increase the facility's capacity. 4. Completed to protect the city of New Orleans and the surrounding area from hurricane storm surge, the Gulf Intracoastal Waterway West Closure Complex includes one of the world's largest interior drainage pump stations and one of the nation's largest navigable floodgates.



GIWW West Closure Complex



MAKING
ELECTRIC
HISTORY



About 120 miles northwest of "The City that Never Sleeps" and 120 miles due north of "The City of Brotherly Love" sits "The Electric City."

Fans of the U.S. version of "The Office" and public transit historians will know that's a reference to Scranton, Pennsylvania. It earned the nickname in the 1880s when it became the first American city with an electric trolley and one of the first to use electric streetlights.

In 1928, the Scranton Electric Company proclaimed it loudly and proudly with a sign atop its building, "Scranton – The Electric City." Now illuminated with LED lights, the sign remains one of the city's most famous landmarks.¹

Just a few miles from Scranton in Jessup, electric history of another kind is being made by one Kiewit team as it installs revolutionary power generation equipment on the way to completing a uniquely designed plant that will be the largest ever built by the company.

The Lackawanna Energy Center (LEC) is a 1,480-megawatt facility developed by Invenergy. At that size, it's not only the largest plant on Kiewit's resume, it will also be one of the largest natural gas-fired plants in the entire country.

"Within Kiewit, the megawatt output makes this about one and-a-half times the size of anything we've built previously. But there are a lot of similarities compared to other power



1. A photo from the summer of 2018 shows the project over 90 percent complete. Unit 1 (far left) is providing power to the grid. 2. One of 54 fan deck modules is set on the air cooled condenser (ACC).

projects we worked on in the past," said Kiewit Power Constructors Co. (KPC) Project Manager Rick Dotson.

One of those similarities is the contract model. Invenergy awarded KPC an engineering, procurement and construction (EPC) contract for the energy center. EPC has become standard on Kiewit's power generation projects

¹ City Of Scranton Historical Architectural Review Board. (n.d.). Downtown Scranton Landmark Buildings and Historic Districts. Retrieved June 01, 2018, from <http://scrantonpa.gov/HARB/Historic-Scranton-Downtown-Scranton-Landmark-Buildings-and-Historic-Districts.pdf>

and brings construction and engineering together to develop and execute a plan that is safe and cost-effective to build while meeting standards of engineering excellence.

A major part of procurement is acquiring the plant's engineered equipment, including gas turbines. Invenergy supplied Lackawanna's turbines. Owners supplying these critical components isn't unusual for KPC, but at Lackawanna the equipment — developed and manufactured by GE — is groundbreaking.

"The technology is brand new," said Kiewit Energy Group Inc. Vice President Tyler Nordquist of LEC's three GE 7HA.02 gas turbines. "The first two were installed a bit ahead of us on another site, but ours were serial numbers 3, 4 and 5."

Designing and building around new models of these incredibly complicated pieces of equipment would require a lot of adaptation. KPC leaned on GE for lessons learned from installation of serial numbers 1 and 2.

"We didn't have a contract with GE, Invenergy did," Nordquist said. "But we were able to engage with them and very much look at the design and get feedback to GE

to further our design and minimize field impacts that would have hurt our schedule down the road. I think we were both able to come to the right solutions together for the project and for Invenergy to make sure the project came in on time."

In addition to revolutionary equipment, the plant's configuration was first-of-its-kind for Kiewit.

"It's a single shaft design so the combustion turbine and the steam turbine both share the same generator," Dotson said.

On other combined-cycle, natural gas-fired facilities, the combustion and steam turbine would each have their own generator. At LEC, the combustion and steam turbines in each unit share the same generator. Dotson explains it as three separate 500-megawatt power plants with turbines and generators existing on their own islands, but sharing the same cooling, air and auxiliary steam systems to complete the facility's operations. Ultimately, fewer generators means the plant will operate more efficiently.

This setup and staggered turnover, or completion, dates for each unit translated into a unique opportunity for sequencing construction.



Caiden Shea, a student at Maine Maritime Academy, was one of nine interns on the Lackawanna project. "One of the best parts about being an intern is the friends you make, and the team you become a part of," he said.

Interns of Lackawanna Energy Center

This summer, nine interns joined Kiewit Power Constructors Co.'s Lackawanna Energy Center project team. Read what a few of them had to say about the experience below.



Cassandra Mondello, Clarkson University

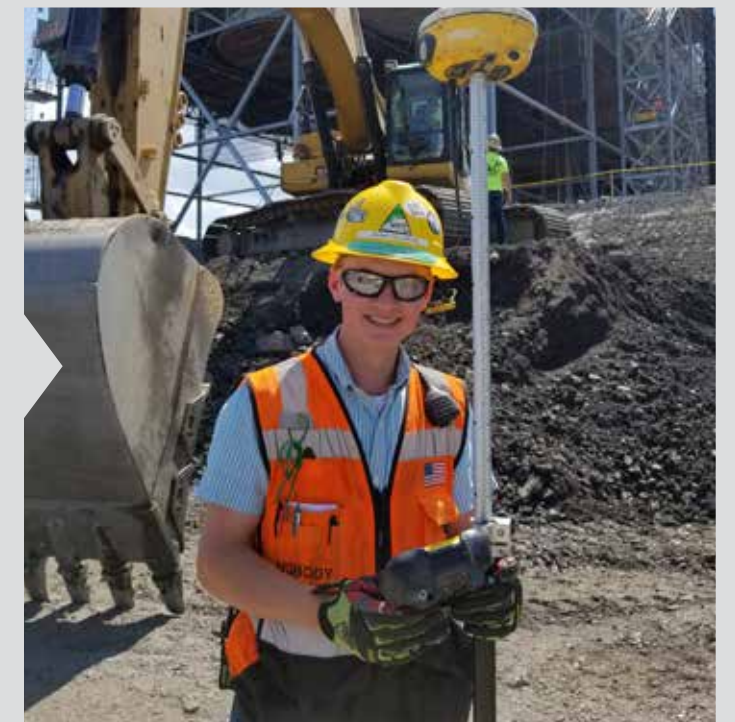
"As the engineering intern for the pipe department, I get to spend most of my day out in the field. While pipe doesn't exactly fall under the civil engineering umbrella, I am very glad that I was able to work and gain experience in a department that is outside of my comfort zone. Working at a power plant has taught me how complex they are, and I have been lucky enough to see the various stages of turning units over to their owners to actually provide electricity to the grid."

Jack Hayes, Missouri University of Science and Technology

"I have learned how the construction process works, and how engineering and construction overlap. I also have learned how to use drawings, piping and instrumentation diagrams (P&IDs), and models to get work done. One thing I gained experience with this summer is what it is like to run a crew, and how management is an important factor in the everyday life of a field engineer."

Jeremy Desjardins, University at Buffalo

"My favorite part about my internship with Kiewit is the opportunity to be a team member and contribute to the success of the project. In the office and in the field, I perform several tasks that are stimulating and meaningful. It was for this reason that I was so excited to begin my internship with Kiewit. You aren't treated like an intern, you are a member of the team ... I look forward to sharing my experience with my classmates."



“Basically we got to build three individual power plants, but they all sit 100 feet away from each other,” Dotson said. “Since there were staggered turnover dates, we were able to work on all of them at once. But in reality, unit one finished three or four months ahead of unit two, and unit two was three or four months ahead of unit three. That allowed us to take lessons learned from the first unit and improve how we performed on the others to see real-time results. That was incredibly valuable on this job.”

Successfully completing a job this large and with this many new components added plenty of variables for the project

team to consider as it planned and executed its approach. Throw into the mix harsh Northeastern winters, a massive project footprint which required extensive civil work to prepare for construction of the actual plant, and the fact that Kiewit didn’t have historical experience working in this part of Pennsylvania, and that’s quite the challenge for any team.

But KPC and the entire Kiewit organization were up for it.

Pulling resources from across Kiewit, a team of highly experienced senior engineering and construction leaders

A shared purpose and passion

Designing and building the Lackawanna Energy Center (LEC) required the largest staff and craft workforce ever assembled by Kiewit Power Constructors Co. (KPC). The staff team included highly experienced senior leaders and many eager first-time engineers on the design and construction sides of the operation. At the highest level, everyone had to be on the same page.



“The big lesson we’ve seen in our business is that if you don’t have the construction leadership with your engineering team to start, a lot of times these jobs don’t go well. You have to have that core group on the same page to get you started,” Nordquist said.

That leadership group and the top project manager set the tone and the example for the rest of the team to follow.

“I think it’s so important to have the top person on the job, the project manager who is responsible for the project to be actively engaged and in there every morning with the team so it’s clear to everyone what’s important,” Nordquist said. “I often equate it to a conductor and everyone is following the same sheet of music.”

Getting everyone playing the same tune has a lot to do with a shared purpose.

“It’s just a passion,” Dotson said. “People are absolutely passionate about what they do. It’s having the vision for what they do and how much of an impact they can make for other people around them and their families.”

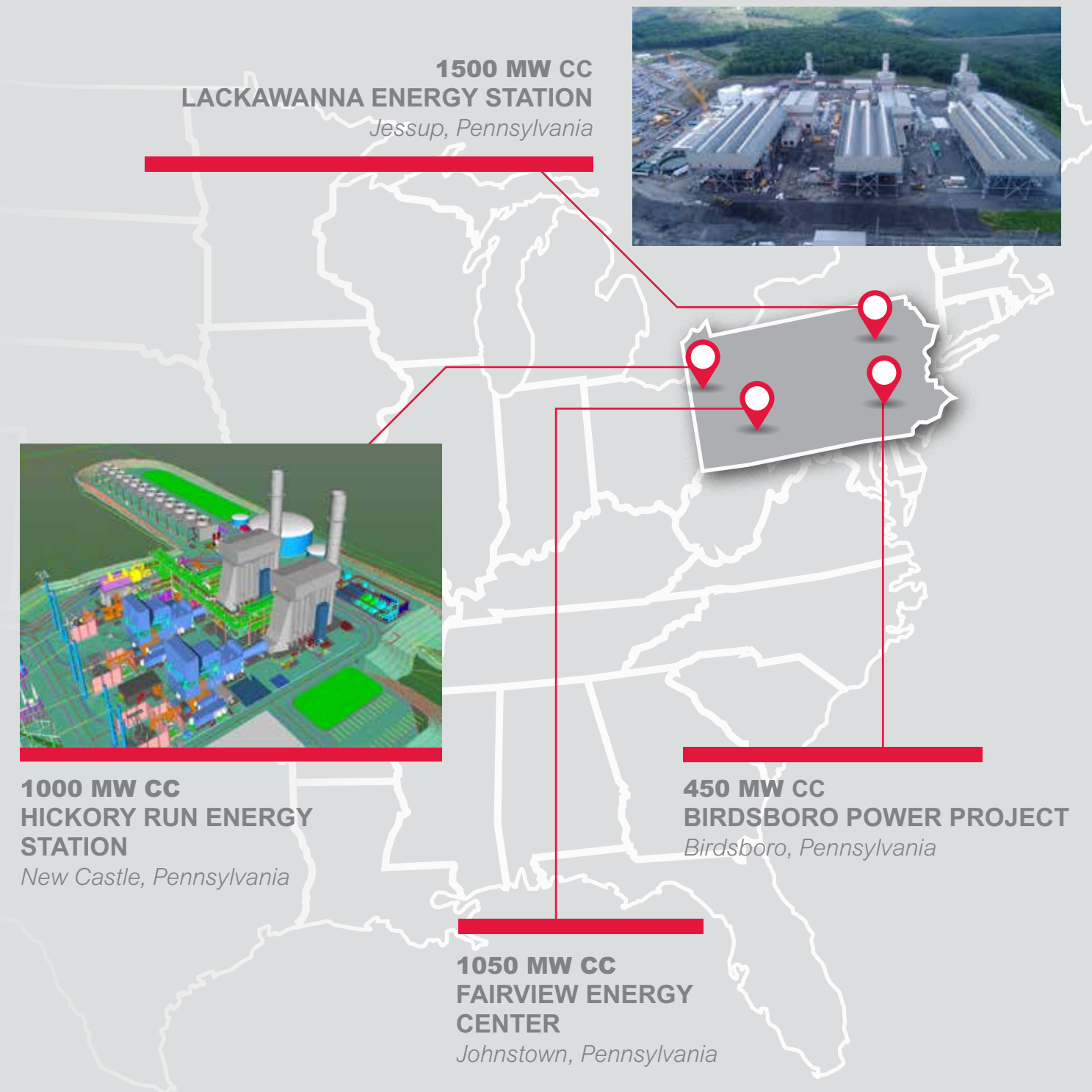
“It’s the old story about you walk up to a group of people building a wall and you ask one what they’re building. The first person says a wall. You ask the second and he says he’s building a cathedral. Everybody thinks they’re building a cathedral per se. Everybody understands what the end game is.”

For Dotson, there’s as much or more passion for building future leaders as there is for building a power plant.

“I think all the time about training and developing to help ensure that future leaders of the company have the fundamentals. And I think this job ensured there’s a good foundation for everybody involved,” he said. “It’s just awesome. You think about the number of people you have the opportunity to impact daily. All projects teach you lessons that just carry to the next one.”

Powering Pennsylvania — and beyond

Kiewit Power Constructors Co. (KPC) has four active natural gas projects underway in Pennsylvania. Combined, these completed plants will produce approximately 4 gigawatts, or enough to power 4 million homes while simultaneously reducing CO₂ emissions by 14 million tons vs. coal-fired generation. That’s the equivalent of taking 3 million cars off the street.



“From a 50,000-foot view, we mobilized to an area where we don’t have historical work to build the largest power plant that we’ve ever built, with the most craft and staff that we’ve ever needed. To do it successfully, safely and on time and under budget, I think that’s the success story.”

RICK DOTSON,
PROJECT MANAGER,
KIEWIT POWER
CONSTRUCTORS CO.

and many eager first-time engineers was assembled to get the job done.

Inverenergy Project Manager Adam Taylor acknowledged the commitment and effort on display.

“Kiewit definitely brings to the table a next-level effort of planning work and getting out in front of challenges and issues before they become monumental challenges and issues,” he said. “That’s definitely something that sets Kiewit apart in a lot of ways from competitors.”

Just over two years since the team got started on this historic project, and as LEC approaches final completion (unit 1 achieved substantial completion in June, making it the first single-shaft, H-class unit to go commercial in the U.S.), the verdict from the Kiewit team is it was a success — and one that will continue to pay dividends for the company for years to come.

“From a 50,000-foot view, we mobilized to an area where we don’t have historical work to build the largest power plant that we’ve ever built, with the most craft and staff that we’ve ever needed,” Dotson said. “To do it successfully, safely and on time and under budget, I think that’s the success story.

“We needed to persevere and get this built for the greater good, and we did. What the team was able to do here and the lessons learned, it’s going to be a key project for Kiewit for a very long time.”

