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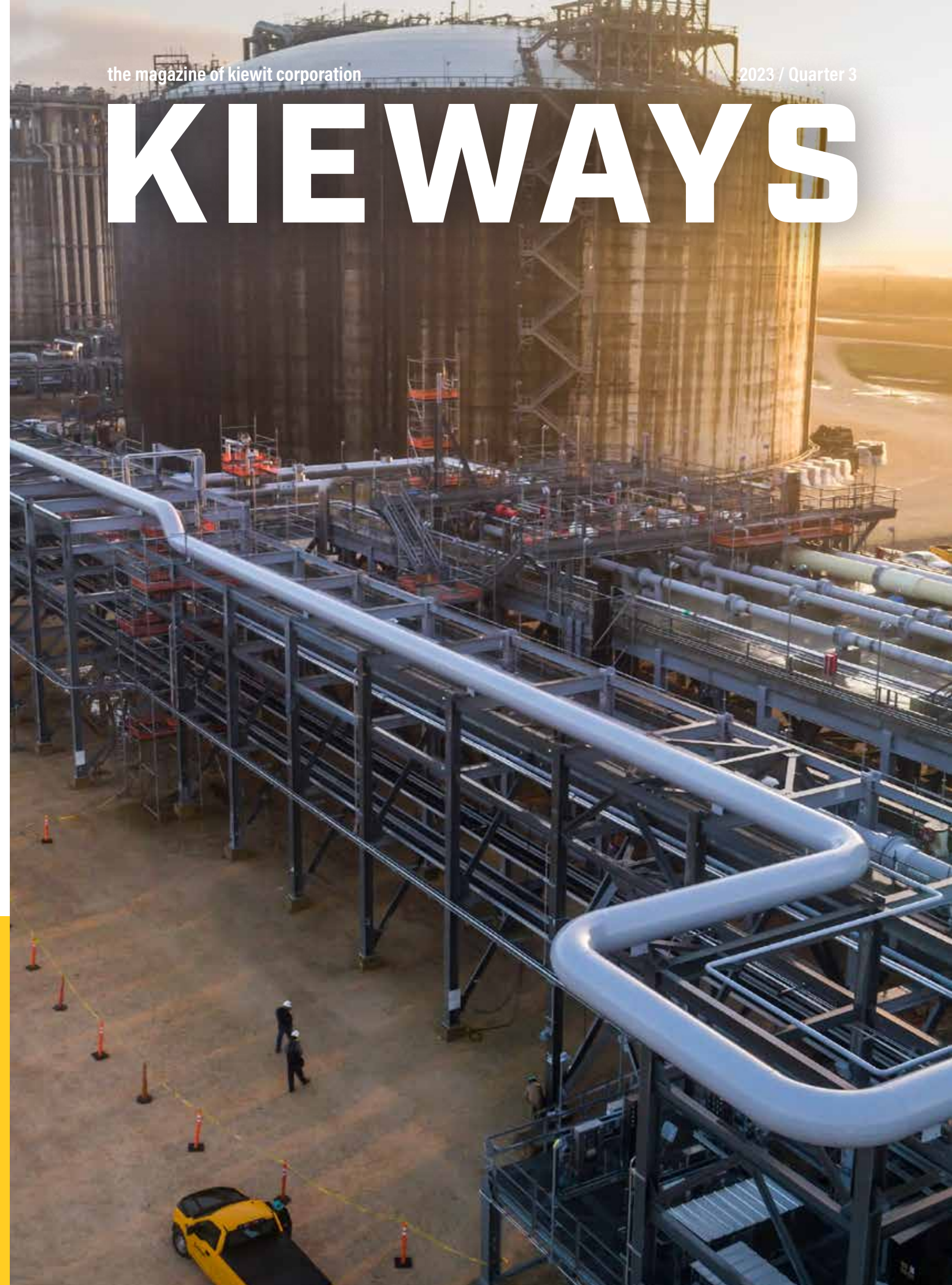


SINCE 1884

the magazine of kiewit corporation

2023 / Quarter 3

KIEWAYS





ON ANOTHER LEVEL

With an expected completion date of Fall 2025, Kiewit-Shea's 2.5-mile bypass tunnel is the largest repair in the 175-year history of the New York City water supply. Learn more about the Delaware Rondout project on page 16.



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; industrial and mining. Kiewit had 2022 revenues of \$13.7 billion and employs 25,700 staff and craft employees.

MANAGING EDITOR: Jessica Jensen Nekola

CREATIVE EDITOR: Ashley Wedeking

CONTRIBUTING WRITERS: Skylar Cain, Lauren Henry, Susan Houston Klaus, Jessica Jensen Nekola, Victoria Ostarly

CONTRIBUTING DESIGNERS: Emma Farrell, Maren Haddad, Kate Harris

CONTRIBUTORS: Sharon Armstrong, Rusty Brown, Elizabeth Fifer

EDITORIAL TEAM: Carrie Chambers, Nathan Gloag, Bob Kula, Dan Lumma, Jessica Jensen Nekola, Shelby Nickel, Craig Olson, Gary Pietrok, Katie Rezabek, Teresa Shada, Ashley Wedeking

KIEWAYS

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PROJECTS, PEOPLE AND PURPOSE

Ask construction or engineering professionals what they enjoy most about working in our industry and many of them will give you the same answer: seeing projects come to life.

The Kiewit teams featured in this issue of Kieways have a unique viewpoint. They're modifying existing infrastructure in some way. This type of work comes with its own distinct challenges, but the same pride and excitement as building something new from the ground up.

The Freeport LNG export facility in Texas shut down following an incident in June 2022. On Pg. 10, read about the effort it took by Kiewit teams to help the client resume operations just nine months later.

In New York, a Kiewit-Shea joint venture is approaching completion of a massive 2.5-mile bypass tunnel to stop a leak in the Delaware Rondout Branch Tunnel. On Pg. 16, learn about what's going on 700 feet under the Hudson River to protect nearly 50% of New York City's drinking water.

And it's not just about our projects, it's about our people that make those projects possible. Staff and craft professionals with many different skillsets, backgrounds, perspectives and experiences are all instrumental in delivering our clients' projects safely, on time and on budget. Before they joined Kiewit full-time, many of our employees were interns. On Pg. 6, read perspectives from some of our 2023 summer interns.

I'm proud to work with more than 25,000 Kiewit employees to deliver projects that make a big difference across North America. I hope you enjoy reading about some of their contributions in this issue of Kieways.

RICK LANOHA

President and Chief Executive Officer



HANDS-ON EXPERIENCE

With over 200 project assignments, the Kiewit intern experience can involve anything from quality checks to financial analysis. However, each intern walks away with unforgettable experiences. Gain a new perspective on Page 6.

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REVIVING FREEPORT LNG

Kiewit stays cool under pressure, restoring operations to the Texas facility following an emergency response.

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POV: YOU'RE A KIEWIT INTERN

With over 1,100 participating students, the Kiewit Internship Program has no shortage of new perspectives for 2023.

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WATER FOR NYC

A joint venture with Shea secures dependable drinking water supply for New York residents.

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

OUR VALUES:

-  PEOPLE
-  INTEGRITY
-  EXCELLENCE
-  STEWARDSHIP

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THE FIRST PHASE OF THE KLAMATH RIVER DAM REMOVAL MOVES FORWARD

The Klamath River Renewal Project is the largest dam removal of its kind in the Western Hemisphere and one of the largest in the world.

Four dams spanning across the Northern California and Oregon border have slowed the flow of the Klamath River, trapping sediment and causing the water to heat up faster than it normally would. Salmon and other fish populations in the Klamath River struggle in these warmer conditions. Kiewit is tasked with removing these dams, opening up four hundred miles of river to salmon migration.

The project has two phases: pre-drawdown and post-drawdown.

This year, efforts are underway to remove Copco 2, the smallest of the four dams, as Kiewit crews focus on pre-drawdown activities for the remaining three dams, which will be removed in 2024. Other important pre-drawdown activities include installing a 3,300-foot, 24-inch-diameter steel waterline for the City of Yreka; drilling and blasting a 90-foot-long, 10.5-foot-diameter tunnel at the base of Copco 1 Dam; and road improvements, including the installation of a 260-foot prefabricated truss bridge over the Klamath River.

In early 2024, Kiewit will drawdown the remaining three dams and remove them after the rainy season. After removal, another contractor will restore over 8,000 acres of reservoir area.

KIEWIT FORMALIZES PARTNERSHIP WITH ARMY TRANSITION PROGRAM

Kiewit formalized a recruitment endeavor with Army Partnership for Your Success (Army PaYS) at a signing ceremony on August 17.

Kiewit Infrastructure Engineers Design Area Manager and Nebraska Army National Guard Colonel Brian Medcalf and Nebraska National Guard Adjutant General Craig Strong signed a ceremonial memorandum of understanding (MOU).

Army PaYS is a strategic partnership between the Army and a cross-section of corporations, companies and public sector agencies. The organization has 1,100 partner organizations, but few in construction and engineering. Through Army PaYS, soldiers are guaranteed the opportunity to interview with partner organizations like Kiewit as they prepare to discharge from the Army.



KIEWIT HELPING MAKE MENTAL HEALTH SERVICES ACCESSIBLE TO CHILDREN IN NEBRASKA

In early August, Kiewit and Chairman Emeritus Ken Stinson joined project partners to break ground on the new Behavioral Health & Wellness Center at Children's, located on the campus of Children's Hospital & Medical Center in Omaha. The facility will increase mental health services for children, adolescents and young adults.

Under the leadership of the Mental Health Innovation Foundation, Kiewit will lead the design-build process for the 107,250-square-foot, four-story mental health center for ages 5-18. The state-of-the-art facility will include 38 single-occupancy inpatient beds, a partial hospitalization program, outpatient consultation offices, an outpatient eating disorder program, and a crisis assessment and triage center, the first of its kind in the region.

Other state-of-the-art features include indoor activity space so children can participate in physical activity year-round, as well as enhanced safety and security features. The new facility will open in early 2026.



KIEWIT BUILDING NEW SUSTAINABLE BIOSOLIDS FACILITY

Kiewit has been selected to build a new biosolids solar drying facility in Tucson, Arizona, that will be a model of sustainability.

The facility is for the Pima County Regional Wastewater Reclamation Department at its Tres Rios Wastewater Reclamation Facility (WRF). The project will reduce the volume of biosolids while producing higher-quality Class A biosolids, which are among the most sought out for compost and fertilizer with no restrictions.

The facility will use 100% renewable resources, utilizing thermal and solar technologies to maximize waste heat recovery. It's expected to be complete by the end of 2024.

Over the last 70 years, Kiewit has completed more than 1,500 water and wastewater projects throughout North America.



KIEWIT EMPLOYEES TAKE HOME THE GOLD IN CORPORATE CHALLENGE

For the first time, Kiewit won the Kansas City Corporate Challenge.

Nearly 300 employees from Kiewit's Lenexa office signed up to compete in a series of intramural sports against other companies in the Kansas City area.

Employees took home gold medals in their division for flag football, softball, basketball, soccer, volleyball, track, kickball and tug of war, along with many individual awards. There was also a blood drive, and Kiewit employees donated the most in their division.

The whole corporate challenge lasted three months, with 148 companies participating across all divisions.

GABRIEL AUBRY

POV

YOU'RE A KIEWIT INTERN

This summer, more than 1,100 students from approximately 280 universities took on the point of view (POV) of a Kiewit intern. They built lasting relationships with mentors and grew from hands-on experience in the construction and engineering industry.



MCGILL UNIVERSITY
CIVIL ENGINEERING



INTERNSHIP ASSIGNMENT: ONTARIO,
LITTLE LONG AND SMOKY FALLS DAM SAFETY PROJECTS

"I worked as a civil field engineering intern last summer, and am grateful to have had the opportunity to join the procurement team for these projects. My everyday work makes me understand and learn more about how a project not only involves day-to-day on-site operations, but also the behind-the-curtains work that tracks all of our expenses and makes sure we have everything at hand to get the most out of what we spend."



NATALEE BRAKE



"My day-to-day responsibilities vary, but I help create work packs, report how much work has been done, assist with quality checks, order consumable supplies, and help out where I am needed that day. One of my favorite parts of the job has been applying knowledge from different engineering courses and using them together. I have also appreciated how serious everyone takes safety and that we discuss it every morning at stretch and flex with our team."



BENEDICTINE COLLEGE
MECHANICAL ENGINEERING



INTERNSHIP ASSIGNMENT: UTAH,
INTERMOUNTAIN POWER PROJECT (IPP)
WITH TIC - THE INDUSTRIAL COMPANY

ANGELE DJOLLA



"My role as an equipment intern is to update the residual energy control system for Kiewit's equipment. This system is implemented to protect workers from injuries caused by energy stored in mobile equipment during maintenance. I have the opportunity to work with the maintenance team, which has not only prepared me for a career in equipment but has also taught me valuable skills in project management and problem solving."



POLYTECHNIC MONTREAL
INDUSTRIAL ENGINEERING



INTERNSHIP ASSIGNMENT: QUEBEC,
RAGLAN MINE

PRIYA KINSAGARA



"As an intern, my responsibilities revolve around taking off quantities of materials required for construction projects. By meticulously reviewing designs and specifications, I calculate the quantities of materials such as concrete, steel and other vital components. This information serves as the foundation for effective procurement, scheduling and cost management. By collaborating closely with project managers and estimators, I ensure that accurate and up-to-date information is shared. This allows the construction teams to plan their activities, allocate resources and make informed decisions with precision and confidence."



ARIZONA STATE UNIVERSITY
CONSTRUCTION MANAGEMENT AND TECHNOLOGY



INTERNSHIP ASSIGNMENT: COLORADO,
KIEWIT INFRASTRUCTURE ENGINEERS OFFICE

Snapshot: Kiewit's 2023 Internship Program



1,171
Total interns



200
Approximate project assignments



Most common roles

Field/office engineer intern, engineering & design intern, operational finance intern, safety intern, equipment intern, quality intern



Most common majors

Civil Engineering, Mechanical Engineering, Construction Management & Engineering, Electrical Engineering, Finance

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Thurgood Marshall College Fund Immersion Program Interns

Kiewit partners with the Thurgood Marshall College Fund to identify Historically Black College & University (HBCU) students to participate in a two-day immersion program. Selected participants are chosen to receive internships and scholarship support from the company.

39

Kiewit Scholars Interns

Through university partnerships, the Kiewit Scholars program provides students with opportunities and experiences to help build their professional capabilities. The program also prepares them to be leaders within Kiewit and the industry.

15

Women in Kiewit and Legacy Diversity Scholarship Interns

The Women in Kiewit and Legacy Diversity Scholarship program is open to eligible Kiewit dependents pursuing construction and engineering degrees.

Data as of August 2023

PARKER GANTER



"I'm a member of the heading excavation crews, where we're excavating two tunnels through the mountains for the Trans Mountain pipeline. During the course of my internship, I was able to gain first-hand experience with a variety of underground tunneling-related responsibilities, including surveying, installing ground support, and drilling/loading and blasting."



UNIVERSITY OF BRITISH COLUMBIA OKANAGAN
CIVIL ENGINEERING



INTERNSHIP ASSIGNMENT: BRITISH COLUMBIA,
TRANS MOUNTAIN EXPANSION PROJECT - SPREAD 5B



REVIVING FREEPORT LNG

When Freeport LNG Development, L.P. (Freeport LNG), needed help with a closely monitored emergency response project, it knew exactly who to turn to: Kiewit Energy Group Inc.

Kiewit was called in within days of an incident that brought operations to a halt at the natural gas liquefaction and export facility in Quintana Island, Texas.

Freeport LNG, an exporter of liquefied natural gas (LNG), reported that on June 8, 2022, an explosion and fire occurred at its liquefaction facility, forcing the facility to shut down. There were no injuries.

Within weeks of the incident, Kiewit was under contract to perform discovery work to get the facility operational again. The team was also tasked with preparing reports for government agencies overseeing the work. TIC – The Industrial Company (TIC), a wholly owned subsidiary of Kiewit Corporation, was hired as general contractor for the project.

It wasn't by accident that Kiewit was the first company that came to mind to make the full restoration of the facility possible.

"We had developed relationships with Freeport LNG to show them our extensive engineering, procurement and construction (EPC) capabilities," Project Director Nathan Wilson explained. "They found themselves in a situation where they needed to rapidly deploy an EPC solution and they knew we were the right solution for them because we are a one-stop shop."

The team rose to the occasion to restore Freeport LNG's facility, Wilson explained, by not only meeting the schedule, but also adapting to changing conditions.

"I'm extremely proud of the way they've handled everything — all while maintaining the client as a raving fan," he said.

However, reaching the destination was not always a smooth ride, as the team faced more obstacles than usual due to the circumstances that led them to the project.



HIGH STAKES FOR RESTORATION

LNG is natural gas that has been cooled to a very low temperature, around minus 162 degrees Celsius (minus 260 degrees Fahrenheit), at which point it becomes a liquid. This process reduces the volume of the gas, making it easier to transport and store.

Freeport LNG is the second largest LNG exporter in the United States and liquefies approximately 2.2 billion cubic feet of natural gas per day. According to the company, this equates to producing enough energy to power the homes of 2.5 million people for a full day.

When the facility shut down operations in June 2022, it had ripple effects throughout the world, disrupting the domestic natural gas market and the LNG markets abroad, which were already stretched as a result of the war in Ukraine.

“The team was well aware of the urgency and importance of reopening the facility, but I don’t feel like at any point they felt they were under pressure,” Wilson said. “I didn’t want the team to feel the stress and pressure because it could have led to working too fast and making mistakes.”

Rather than letting the project’s surrounding circumstances influence them, the team focused on working efficiently and prioritizing safety on-site.

Because the Kiewit and TIC teams were working with a highly flammable gas, they used pressurized welding enclosures (PWEs), which took safety to a higher level. The PWEs are structures that create a safe environment for welding when the welder needs to work around live process lines containing flammable or combustible fluids. These enclosures are pressurized with a constantly monitored flow of clean air, mitigating the risk of fires.

In addition to the PWEs, another unique aspect to the restoration work was the construction and installation of vacuum insulated piping (VIP).

VIP is a type of piping system that uses a vacuum to insulate a pipe designed to transport cryogenic liquids like LNG. The vacuum reduces heat loss and improves energy efficiency.

1. One of the primary goals was to restore the pipeline between the facility and its LNG storage tanks. Liquefaction significantly reduces the volume of the gas but involves highly specialized equipment to do so. 2. Located in southeastern Texas, the facility is the second largest LNG exporter in the country. 3. The emergency response from Kiewit Energy Group aimed to restore operations to Freeport — and the power it provided around the world — as quickly and safely as possible. 4. Teams worked together diligently and with a focus on safety above all else.



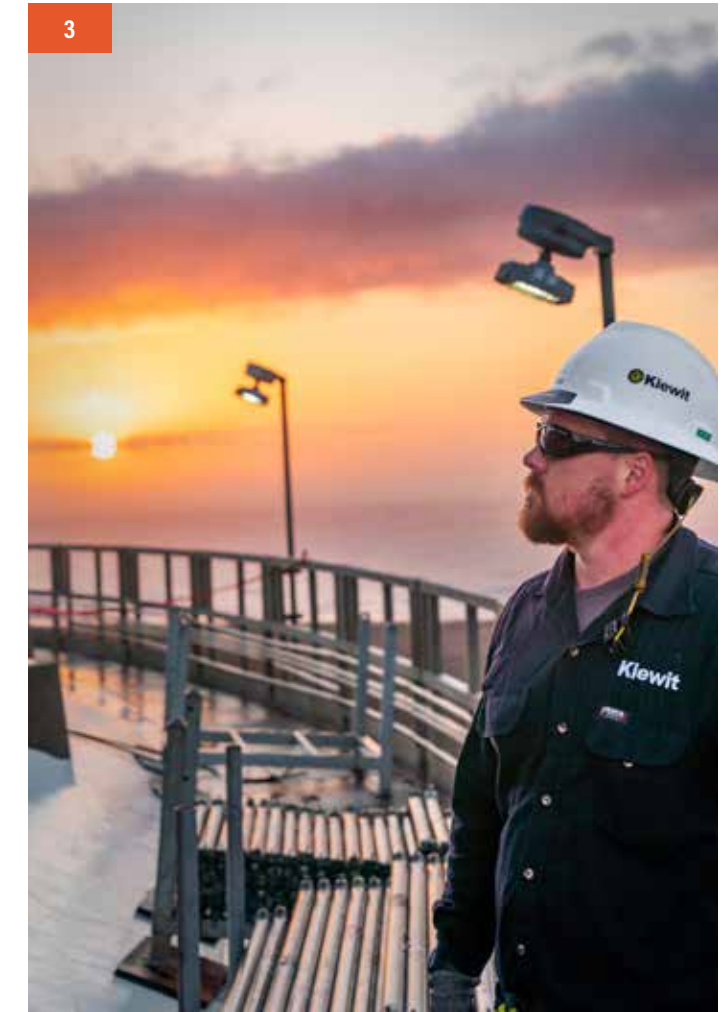
The project crew was new to this type of piping, which is more complex than non-vacuum insulated piping. However, Wilson praised the team’s adaptability and skilled handling of the learning curve.

“It’s a good showcase of our ability to tackle something new and rapidly learn the nuances of it,” said Wilson. “The team immediately implemented lessons learned to work more efficiently and productively.”

TIMELINE DELAYS

Project construction and restoration came with a specific requirement: getting incremental regulatory approvals from the Pipeline and Hazardous Materials Safety Administration (PHMSA) and Federal Energy Regulatory Commission (FERC). These reoccurring approval requirements introduced schedule uncertainty into the project’s timeline as they needed to be met before work could continue. Failure to obtain approval at any stage of the project would throw off the critical path of planned activities.

To timely secure the approvals, the team put in extra hours to write damage assessments and remedial plans, and engaged in intensive editing workshops to produce reports for the regulators. Once the documents were submitted, the team used the waiting period to strategize and, as necessary, resequence work to minimize impacts on efficiency and schedule.



"Everybody on the job was proud of their part in this effort to get Freeport LNG back and operational. It felt like we were not only helping the client but also contributing to a greater cause."

NATHAN WILSON
Project Director

"There were usually only 30 minutes between the time we got the email approving work and when we started the work," Wilson said. "That speaks volumes about the quality of people we had on this project."

David Dukat, TIC senior vice president responsible for the company's southern operations, explained that the team used focus, determination and a high attention to safety to do everything in their power to move the project along.

"They tackled the challenge head-on, detailing the plan from day-by-day to hour-by-hour, and whenever we were released from FERC or PHMSA to execute the work, they beat the deadline every time."

Wilson explained that project leaders set reasonable expectations as the project developed. Instead of burdening the team with unnecessary stress, they fostered innovation and maximized their use of time.

TIME-SAVING ALTERNATIVE APPROACHES

The June 8 incident damaged an LNG rundown line, which is a 26-inch-wide, 1,500-foot-long pipe that carries the LNG to its storage tanks. The piping needed to be replaced to get Freeport LNG back into commercial operation.



Freeport LNG Project Phases

- ▶ **PHASE ONE**
Completed in February, brought all three natural gas liquefaction unit trains back online.
- ▶ **PHASE TWO**
Forecasted to be complete in September, pending regulatory approvals.
- ▶ **PHASE THREE**
Forecasted to be complete in October, pending regulatory approvals.



The foremen's meeting on the Freeport LNG project was an interactive experience each week. The typical meeting was revitalized using the Front-Line Supervisor (FLS) Safety Leadership training and development manual. The focus was not only on safety, but also developing leaders who understand the safety culture and can lead the business into the future.

The team ran into a problem when they found they needed to wait three months for new pipe, which would have caused a delay in the project. Instead of accepting that as fact, the team sat down with Freeport LNG representatives and together brainstormed a new solution, in the form of an old pipe. Thinking outside of the box, they realized they could take piping from a later phase of the project and use it in the rundown line to keep things moving.

"We harvested 720 feet of pipe and then had a custom piece made to connect everything together," Wilson explained.

This idea saved the company hundreds of millions of dollars and helped restart the export of LNG 90 days sooner.

Innovation was taken a step further during pipe harvesting. To get the pipe from its location on a 40-foot-high rack would traditionally involve using bull rigging, a high-risk construction activity. Instead, Wilson explained, they developed a unique and significantly safer method to pull the spools without bull rigging.

"They came up with a plan to utilize rollers. They rigged the pipe and then set it on the first roller to roll it down the length of the rack," Wilson said. "Our construction manager was very involved in creating a clear plan and executing

that plan flawlessly. It was a great job on the team's part to eliminate risk."

THE COMEBACK

Freeport LNG Chief Operating Officer Mark Mallett explained that with Kiewit's help, Freeport LNG was able to resume full operations after phase one of the project, only nine months after the June 8 incident.

"Working collaboratively alongside our team, Kiewit played a vital role in the safe and successful reconstruction and restart of our liquefaction facility," said Mallett. "The Kiewit team was comprised of highly skilled EPC workers, whose solution-minded approach to each task resulted in a safe and successful return to operations."

Because the endeavor was so successful, Wilson believes this project could become a notable entry in Kiewit's history book for emergency response projects.

"Everybody on the job was proud of their part in this effort to get Freeport LNG back and operational. It felt like we were not only helping the client but also contributing to a greater cause," Wilson said. **K**



WATER FOR NYC

Joint venture Kiewit-Shea is scheduled to complete a 2.5-mile bypass tunnel to stop a leak in the Delaware Rondout Branch Tunnel 700 feet under the Hudson River. It's the largest repair ever in the more than 175-year history of the New York City water supply system.



1. The shaft mining site with the signature "head frame" over the shaft also included storage for the precast tunnel lining. 2. The underground chamber being prepared for the assembly of the TBM. 3. Foundations being placed for the buildings housing the hoists that service the shaft.

Anyone who's enjoyed a slice of pizza or a bagel in New York City may take for granted one of its most important ingredients: water.

About 50% of the city's drinking water — equaling about half a billion gallons that impact 9.6 million New Yorkers every day — comes from a watershed 125 miles north of Manhattan.

Reservoirs in the Catskills provide water from the Delaware River, carried by the Delaware Aqueduct. The longest tunnel in the world, the 85-mile-long aqueduct branches into other supply tunnels to the city and surrounding counties.

In the early 1990s, studies by the New York City Department of Environmental Protection (DEP) monitoring the aqueduct found significant leaks in one of those branch tunnels that crosses right before it reaches the Hudson River. As much as 35 million gallons of water was being lost per day.

DEP selected joint venture Kiewit-Shea to repair the leaks in the Rondout-West Branch Tunnel and construct a 2.5-mile-long bypass tunnel to tie in to the main structure and ensure the water will flow leak-free for at least a hundred years.

The team began work in summer 2016.

PLACING THE EQUIPMENT

Working below the surface is never a simple task. On this project, the equipment had to be sent down an entry shaft about 900 feet underground and retrieved from the exit shaft about 700 feet underground.

The team elected to use a hard rock tunneling machine,

which would probe out the rock up to 400 feet ahead.

Lowering the assembly for the tunnel boring machine (TBM) and the concrete liner that would be placed in the tunnel required some ingenuity, said Niels Kofoed, tunnel manager.

"The deepest shaft most of us had been dealing with was maybe 100 or 150 feet for assembling a TBM, so doing the same thing through a 900-foot shaft was certainly one of the big challenges up front."

Engineer Don Brennan developed a three-part hoisting system and assembly cradle that would carefully put together the pieces of the TBM in a confined 32-foot diameter, much like moving the pieces of a giant puzzle.

As the components were lowered into place, the team slid the pieces back and forth to accommodate them. The cutter head on the TBM itself, a 100-ton pick, was gingerly lowered in one section.

"I think that process was as impressive as what we did setting up for the actual tunneling," said Kofoed.

FILLING THE CRACKS

The methodology used to construct the tunnel was fairly unique, said Project Manager Grant Millener.

"We're constructing a tunnel directly below the Hudson River. There's infinite water inflow and the ground is fairly permeable, so we were expecting a lot of water."

To prevent water from rushing into the tunnel as it was excavated, the team used a pre-excitation grouting method to seal off the inflow of water.

The team probe-drilled up to 400 feet ahead of the TBM. If they encountered water inflow above a preset threshold level, the team would drill and grout the holes they identified and inject grout into the rock at pressures up to 1,000 pounds per square inch.

The team had done grouting on previous projects, but this was its first time working with such a large inflow of water. Despite the challenge, the method proved very successful, said Millener.

THE PERFECT MIX

While the original tunnel was lined with a combination of rebar and some concrete, the new liner was built for the long haul. It boasts three layers: precast concrete, one-inch-thick steel pipe and rebar-reinforcing steel.

"It's quite a robust lining system," said Millener. "We started at about 21.5 feet in diameter and the final tunnel is only 14 feet in diameter."



The outer layer, designed to support the tunnel, was set at the same time the TBM tunneled through. The other pieces were welded together, set in place and sealed. Then, the team grouted behind the pipe to the outer liner layer.

Placing the concrete for the final lining required the team to drop the concrete as much as 900 feet and then pump it.

“We pumped over a mile to the final placing,” said Matt Higgins, construction manager. “We did that for both sides of the river and it’s pretty unique to drop concrete and pump it that distance.”

Before the team placed any concrete for that final layer, they did a mockup — testing the concrete mix and the distance it needed to be pumped.

Still, adjustments were needed to get exactly the right mix, Higgins said.

“We did a bunch of testing to tweak the additives in the mix to make sure it was flowable and wouldn’t set up too fast or too slow. You’ve got to find a sweet spot where you can strip the forms as fast as you can, because it’s all cyclical. You want to be able to place the concrete, let it harden up enough and then move it ahead to do the next placement.”

At one point, he said, the team was testing every truckload that came in to get the right spread to make sure it was pumpable and would be the right mix. Sensors inside the concrete confirmed when it was the right consistency to strip the forms.

A LASTING IMPACT

As the team prepares to connect the bypass with the aqueduct, Kofoed said he’s most proud of the team’s ability to keep advancing the work.

“Even with all the planning that we did, we had to make a number of modifications. But the team kept moving forward and always had a positive attitude attacking the challenges.”

And while the taste of a New York City slice of pizza or bagel won’t be affected in the long term, the project will have a lasting impact in the area, Millener says.

“This is one of the world’s best water systems and we are going to provide reliable water for New York City for a hundred years. Kiewit-Shea, with its resources, was able to build the right team for the job — I’m not sure there’s any other contractor that could have tackled this challenge.” **K**

Timeline

JUNE 19, 2015
Contract awarded

JULY 6, 2015
Notice to proceed



JANUARY 8, 2018
TBM launches



AUGUST 13, 2019
Hole through



MAY 15, 2020
Steel interliner installation
in tunnel complete



FEBRUARY 22, 2021
Concrete lining of
tunnel complete

DECEMBER 12, 2021
Steel and concrete shaft
lining completion

AUGUST 16, 2022
Ready for tie-in

FALL 2025
Expected completion

