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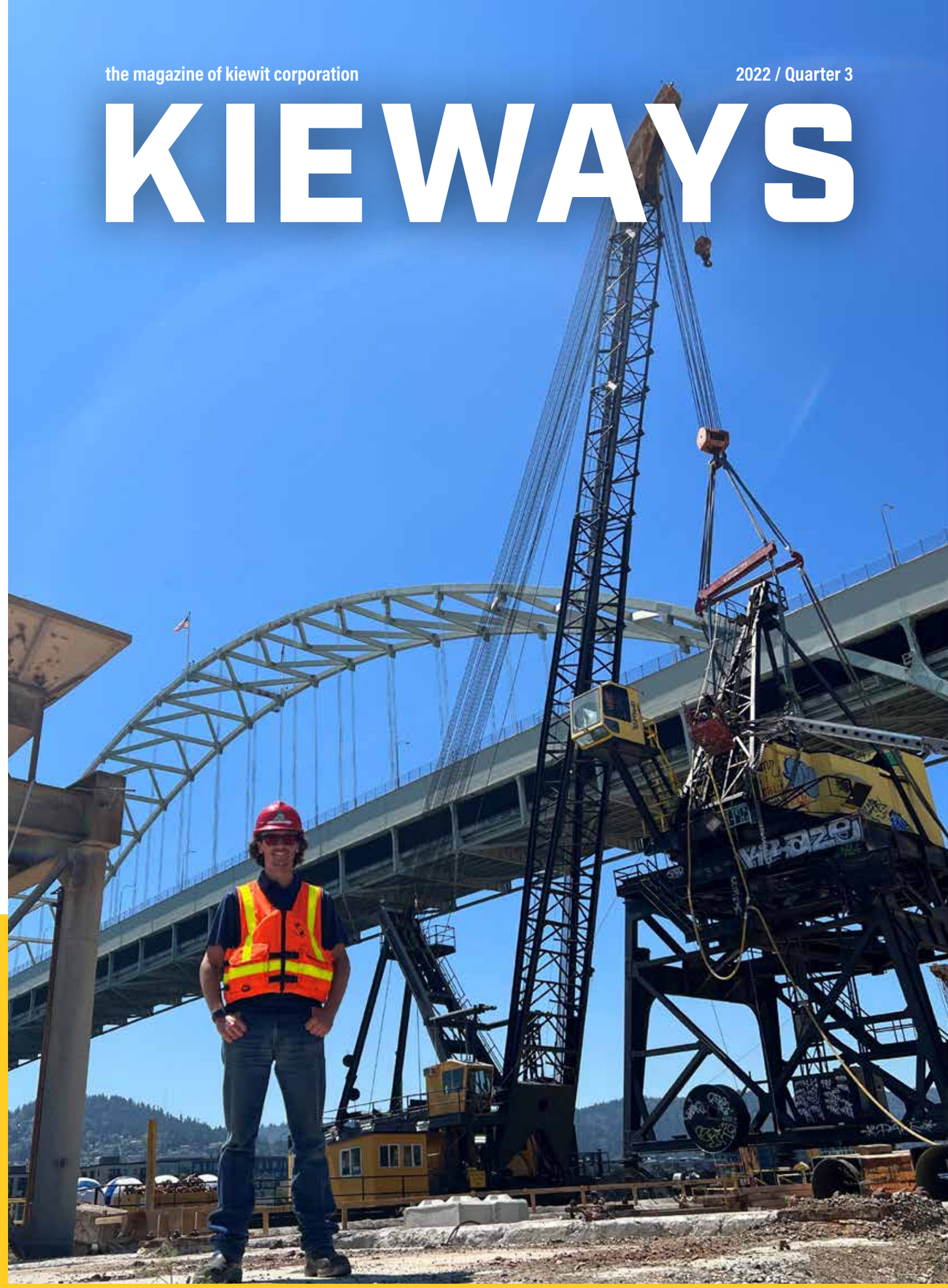
SINCE 1884

the magazine of kiewit corporation

2022 / Quarter 3

KIEWAYS



POWER ON
A united project team delivers the Seminole Combined Cycle Facility, self-performing a broad scope of work and developing relationships with partners and a first-time client. Read more beginning on Page 16.

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; industrial and mining. Kiewit had 2021 revenues of $12.1 billion and employs 28,800 staff and craft employees.

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KIEWAYS
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KIEWIT TEAMS DELIVER IMPRESSIVE PROJECTS COAST TO COAST

With a strong local presence and access to a vast network of resources, Kiewit can quickly mobilize to provide solutions for projects across North America. In this issue of Kieways, you'll read stories about teams delivering projects from coast to coast.

On the West Coast, Kiewit Infrastructure West Co. is upgrading the Columbia Boulevard Wastewater Treatment Plant, protecting public health and ensuring water quality in the region's rivers. On Page 20, read about how the team executes demolition and construction activities at the Portland facility, which operates 24/7.

On the East Coast, a close-knit project team built a one-gigawatt, natural gas-fired power plant in northeast Florida. The Seminole Combined Cycle Facility will increase total power output and decrease emissions while providing energy for 1.9 million consumers and businesses in Florida. Read about it on Page 16.

This issue also features our interns. More than 850 interns joined Kiewit this summer, working across 260 job sites and offices. It's our longstanding tradition to give interns real responsibilities from Day One, allowing them to learn as well as contribute. See Page 6 to read about some of their experiences.

Finally, on Page 10, we tell the story of how we've worked to combat global supply chain issues that have disrupted our industry over the past two years, leveraging our supply network to manage risk in escalation, material shortages and shipping delays. By leaning on the relationships and expertise of dedicated procurement experts, we've proven we can execute aggressive schedules at the lowest cost.

I hope you enjoy this latest issue of Kieways. Thank you to our clients, partners and employees for all you do.

RICK LANOHA
President and Chief Executive Officer

ON THE CLOCK
Serving the rapidly growing city of Portland, a project team makes a big impact by bringing wastewater treatment operations into the 21st century at the Columbia Boulevard Wastewater Treatment Plant. Read about it on Page 20.

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

OUR VALUES:

- PEOPLE
- INTEGRITY
- EXCELLENCE
- STEWARDSHIP

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KIEWIT TEAMS BUILD TWO SUSPENSION BRIDGES IN RWANDA

In June, 20 Kiewit employees traveled to Rwanda to build two suspension bridges with longtime Kiewit partner, Bridges to Prosperity (B2P), a nonprofit organization whose mission is to "create a world where poverty caused by rural isolation no longer exists." The organization builds bridges to provide access to education, health care and economic opportunity for communities living in destitute areas around the world.

The Mukaka bridge is a 118-meter suspension bridge serving 2,500 community members and the Gisiza bridge is an 88-meter suspension bridge serving 7,000 community members. These two bridges broke several B2P records: the Mukaka bridge is the longest B2P bridge built this year and the Gisiza bridge impacts the largest community ever for B2P.

"Seeing the community using the bridge at the inauguration was the ultimate payoff," said Kiewit employee Ethan Brand. "I was proud to walk away knowing the bridge will provide a safe and reliable crossing to thousands of people during the wet season. It is a great feeling."

A NEW MUNICIPAL COMPLEX FOR GREGORY, TEXAS

In late July, the City of Gregory, Texas, celebrated the opening of the Gregory Municipal Complex, a 10,000-square-foot facility now home to the town's volunteer fire department, city hall and community center. The previous city offices were more than 40 years old, and the original fire hall was significantly damaged by Hurricane Harvey and later torn down.

The new municipal complex was made possible through a $5 million funding grant from Gulf Coast Growth Ventures (GCGV), the client of the Olefins Recovery Project built by Chiyoda Kiewit Joint Venture (CKJV), as part of their good neighbor program. For CKJV, Kiewit provided engineering management, procurement and construction management services for the complex.

"From the very beginning the City of Gregory truly embraced and supported the CKJV team and made us feel part of their community," said Paul Geldmeier, executive vice president, Kiewit Energy Group Inc. "We carried the pride and gratitude we feel for this community into every blueprint and every inch of construction for this tremendous and much needed facility."

NATIONAL REHABILITATION PROJECT OF THE YEAR

The Santa Anita Dam Spillway Modification Project is the Association of State Dam Safety Officials (ASDSO) National Rehabilitation Project of the Year.

Major components of the project included a new spillway, replacing flood control and backup valves, construction of a new helipad for emergencies and improvement to the dam's control systems. Despite all obstacles, including a major rockslide, the Kiewit Infrastructure West Co. team finished the project on time.

THURGOOD MARSHALL COLLEGE FUND

Among Kiewit's summer interns this year were several Historically Black College and University (HBCU) students who participated in a company immersion program through the Thurgood Marshall College Fund (TMCF).

This program is one piece of Kiewit's ongoing efforts to diversify the company's recruitment efforts and workforce.

"We've never had a higher priority on diversity, equity and inclusion within Kiewit," said Darron Rolle, vice president of Human Resources and member of Kiewit's corporate Diversity, Equity and Inclusion Committee. "Our company's leadership has prioritized getting a different viewpoint and more diverse representation throughout our organization."

TMCF acts as a bridge between 47 HBCUs and companies like Kiewit.

As a part of the partnership, students receive financial support and internship opportunities with the company. This year, eight TMCF scholarship recipients interned with Kiewit. One of those students was Eljin Rhymes, a fourth-year industrial engineering student at Florida A&M University. Rhymes interned on the construction site of a production line plant in Blair, Nebraska.

His biggest takeaway was, "learning to be adaptable to whatever environment that I am placed in so I can be successful when traveling to different regions and taking on tasks outside my normal comfort zone."

Read more from some of Kiewit's summer interns on Page 6.

1,100 MW FACILITY COMES ONLINE IN MICHIGAN

The Indeck Niles Energy Center entered service in Michigan.

Kiewit Power Constructors Co. served as the engineering, procurement, construction (EPC) contractor for the 1,100 MW energy center, which is operated by Indeck Energy Services and features two GE 7HA.02 gas turbines, powering two GE-supplied H65 generators.

"The Niles Energy Center will have a positive, lasting impact on the community by reducing carbon emissions and providing reliable power," said Chris Turnbull, president of Kiewit Power Constructors Co. "We are proud to have served as the EPC contractor and to have worked in close partnership with Indeck and GE in delivering this state-of-the-art facility."

INTERNS OF KIEWIT

BEEN THERE. BUILT THAT.

1

From the coordination required to help students relocate across the country to the time it takes to explain how to safely use a piece of equipment on the project site, the Kiewit internship program is a full company effort. This summer, over 850 interns, from over 200 different universities, joined Kiewit teams across North America. Their footprints can be found across 260 job sites and offices.

Kiewit interns have the opportunity to work on the company's extensive scope of projects, all while learning from industry experts.

"It is our job to give interns a realistic picture of what it is like to work for a construction and engineering firm," said Vice President of Human Resources Darron Rolle, who began his career as a Kiewit intern.

These interns are challenged to embed themselves within the company and see their more experienced coworkers as teachers. According to Rolle, being curious and focused will set students up for future success.

"Ask questions, get to know the organization and understand why you do what you do," said Rolle. "And developing a good memory means you can be an asset to the organization no matter where you're placed because the same things come up again and again."

This year's summer interns represented 93 majors and fields of study. Project assignments spanned multiple disciplines and markets to accommodate student's range of interests. As these interns return to their universities or accept full-time positions, it is clear that this professional experience sets them apart from their peers.

"When they go back to school they can talk about how their work contributed to the bottom line of the company," said Rolle. "They can show all of their classmates what it means to work at a company like Kiewit."

Here is what some of the interns had to say about their summer with Kiewit:

TAYLOR LEE
COQUITLAM-BUNTZEN TUNNEL GATES PROJECT,
BRITISH COLUMBIA, CANADA
BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

I have had the privilege of being surrounded by a team that always puts safety first and isn't afraid of the challenges to come. I've never been on a project with as many unique challenges as Buntzen, so I can truly appreciate the experience that they have provided me with here. Thank you to my team for continually teaching me and preparing me for my future career.

Katie Allan, project manager said, "Taylor has been a great addition to our team and has attacked every problem we have thrown his way. We are all looking forward to when he decides to join the Kiewit team full time next year."

SEAN CRAVEN
WMATA 4 PROJECT, WASHINGTON, D.C.
PENN STATE UNIVERSITY

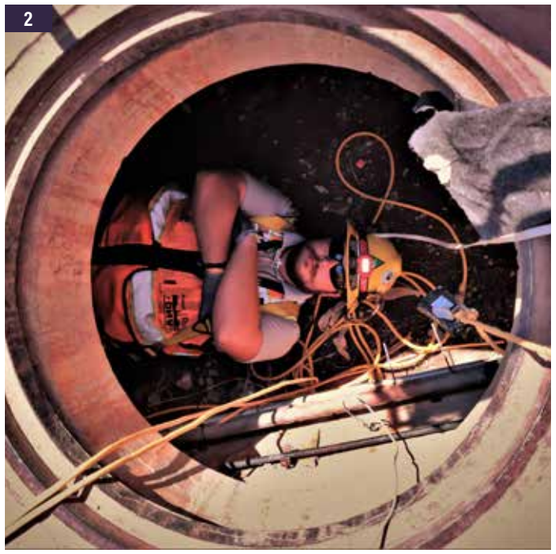
This is my first internship with Kiewit, and while I have only been on this project for a short time, I have learned lessons that I will carry with me for a lifetime. Getting to work, day in and day out, with the various subcontractors and staff has developed my communication, managerial and technical problem-solving skills immensely. Part of my day-to-day operations includes material acquisition, subcontractor oversight, report submittals, and, most importantly, maintaining a safe workspace so each and every one of our people get home safe. I found the support Kiewit offered me as an intern unlike that of any other job I have previously worked on.

Mark Ross-Hixson, project engineer, said, "At first glance, you would never think Sean is an intern on this project. He comes to work every day eager to learn, ready to get the job done and focused on solving problems. His positive attitude and desire to take on more challenges will help him achieve a great deal in his career."

WYATT JONES
SEATTLE MARINE YARD, SEATTLE, WASHINGTON
CALIFORNIA STATE UNIVERSITY, FRESNO

The experience and knowledge that I have gained from my internship thus far has been nothing short of priceless. I have learned more in one week about cranes and barges than most people learn in their entire lives. I have traveled to multiple job sites to assist in the maintenance and inspection of these massive pieces of machinery. I am very thankful to be a part of the Equipment Team ensuring the continued performance of our marine fleet. The group of coworkers I have been surrounded by have taught me to work hard, communicate efficiently and to strive to be the best. I look forward to the remainder of my internship where we continue building America!

Will Gonder, equipment superintendent, said, "Wyatt hit the ground running on Day One and has not let up since then. He traveled the West Coast as maintenance needs arose, meeting nearly every member of the marine maintenance team on the way. His contributions to repairs and maintenance to the fleet are much appreciated, and his self-motivation will take him far in whatever he decides to do."



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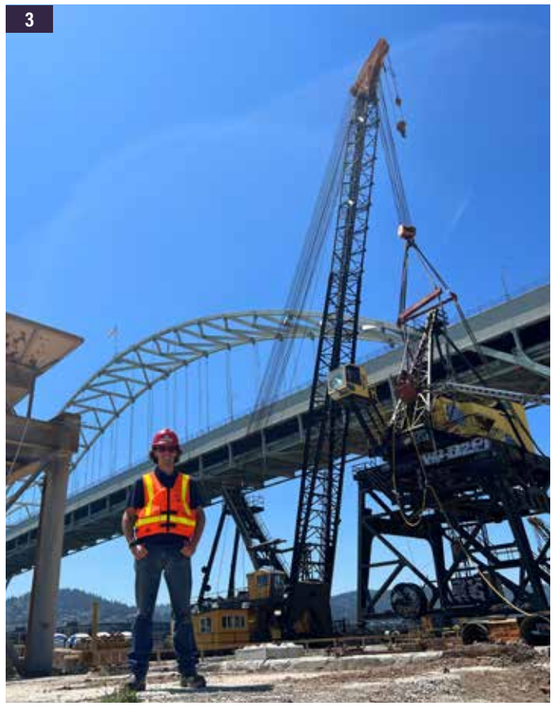

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1. Lee in the adit of a tunnel in British Columbia, Canada. 2. Craven working to verify core hole locations used to run fire standpipe. 3. Jones visiting the I-205 Abernethy Bridge project. This photo was submitted as a part of the 2022 intern photo contest. No work activity was taking place at the time.

Coast to coast

Company interns worked across North America last summer. With a wide array of work to be done, interns gained professional work experience in their field of study. Like other Kiewit employees, they also learned to go where the work is.

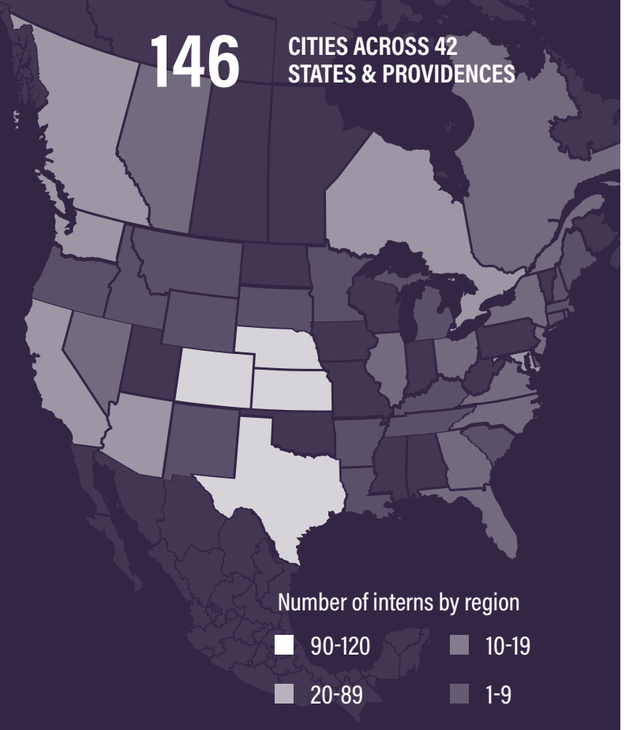
Kiewit interns in 2022

93 MAJORS & AREAS OF STUDY

206 UNIVERSITIES

260 JOB SITES & OFFICES

146 CITIES ACROSS 42 STATES & PROVIDENCES

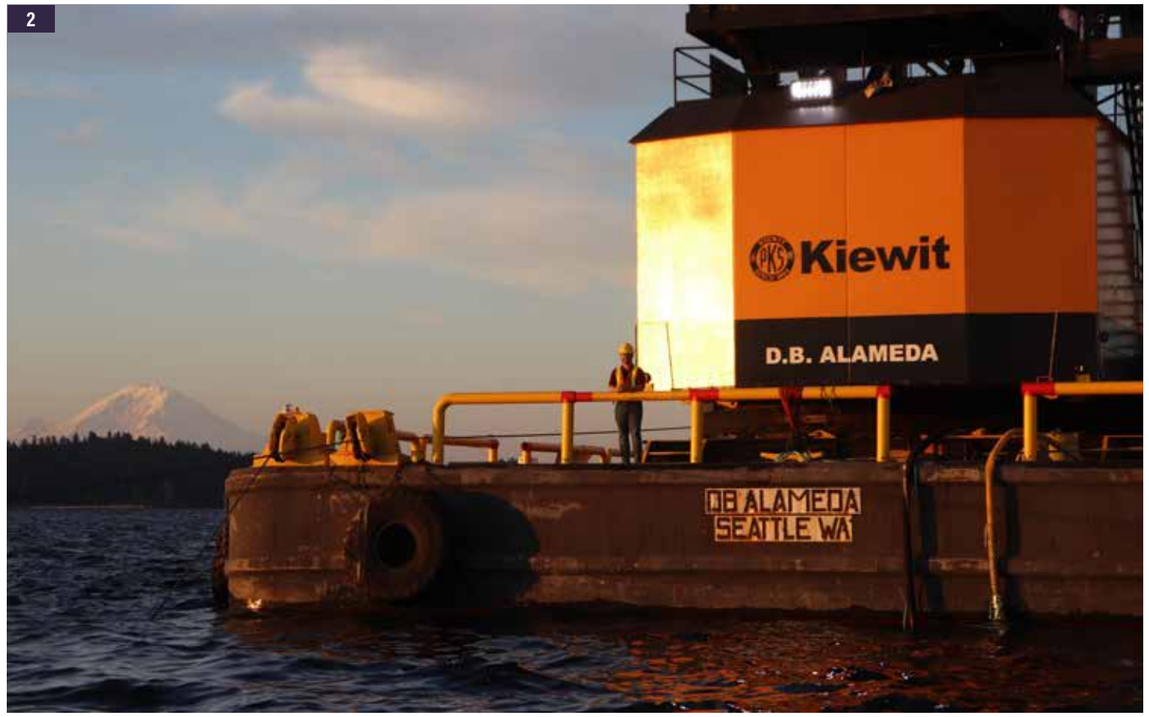


1. Sanchez pictured next to a D8 dozer on the job site in Golden, Colorado.
2. Blount standing on the deck of the D.B. Alameda, the derrick used on-site.

BRIANNA SANCHEZ
NORTHWATER TREATMENT PLANT, GOLDEN, COLORADO
NEW MEXICO STATE UNIVERSITY

The Northwater Treatment Plant (NTP) project is truly an experience I am not taking for granted, as it is an approximately $450 million job with over 1.5 million manhours worked so far! This is my first internship and my Kiewit team is always open to answering all of the interns' questions, encouraging them to ask more and planning tours across all scopes at NTP. I'm glad to be located here, being that it is a huge project with 15 structural buildings. It's safe to say that there is a lot to look at and learn. It has been a crazy experience having come from school and only having "book knowledge" to being on this project learning constructability hands on!

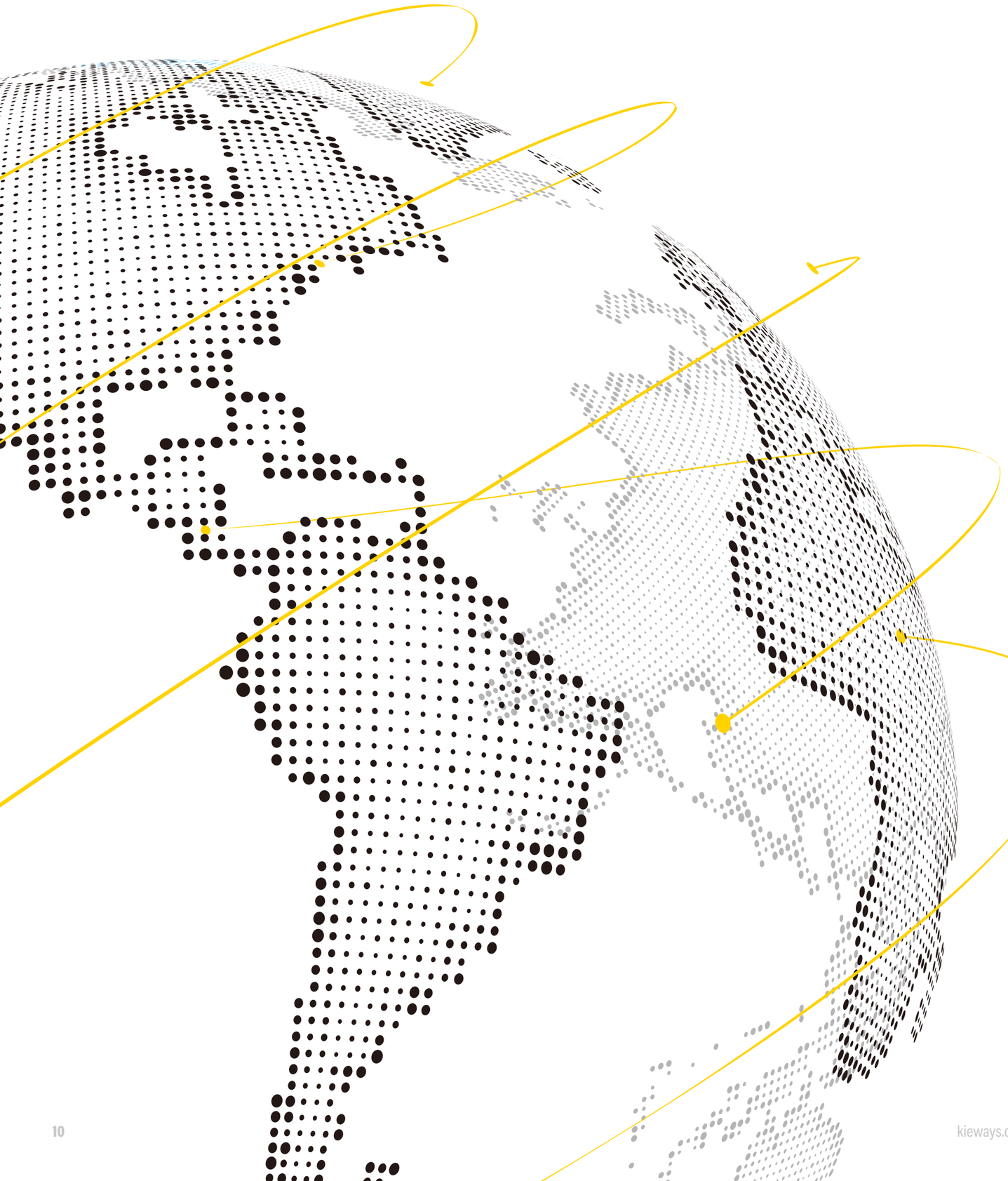
Alexandra Graham, grading superintendent, said, "Brianna has been a great addition to the Kiewit and NTP family this summer. She is curious, motivated and does not shy away from a challenge. It has been exciting watching her grow in knowledge and confidence over the summer."



MATT BLOUNT
FLOATING BRIDGE ANCHOR CABLE REPLACEMENT PROJECT, SEATTLE, WASHINGTON
PURDUE UNIVERSITY

This is my third internship with Kiewit, but my first out in the field. My main responsibilities have included quality inspection and material inventory/procurement, as well as other one-off tasks such as creating a pick plan for our airlift jetting operation. On deck, I have been responsible for inspecting the cable as it spools out, and from inside the pontoons of the bridge, I have assisted in the socketing and tensioning process. It has been an incredibly unique and rewarding experience to be working out on the water every day. We have a breathtaking view of Mount Rainier, which never ceases to amaze me. I am extremely grateful to Kiewit for giving me the opportunity to work on a highly specialized project and grow as an engineer.

Justin Stange, project engineer, said, "Matt's experience this summer has introduced him into the world of marine construction. He's had the opportunity to gain firsthand experience as a field engineer overseeing a major portion of our quality control. Matt has also gained an understanding of how we do business in regard to planning, purchasing, temporary engineering and safety, all while living our company core values." **K**



KIEWIT SUPPLY NETWORK:

Understanding and mitigating supply risks

In March 2021, the world's eyes were on the Suez Canal where the Ever Given, one of the largest container ships in the world, was stuck in the vital passageway, blocking all traffic and delaying billions of dollars' worth of cargo. News organizations followed the incident as crews worked to remove the container ship and restore critical trade routes between the U.S., Europe, Asia and the Middle East.

While the ship was finally freed after six days of emergency efforts, the impacts to the global supply chain lasted for months. One of the direct impacts: 20 containers destined for a Kiewit energy project were delayed more than two weeks because the ship was unable to pass through the canal due to the blockage. The Ever Given incident is one illustration of the risk involved in procurement and shipping, which is increasingly impacting the construction industry and Kiewit directly.

Over the past two years, the construction industry has been hit by what many have called the perfect storm: global supply chain issues, inflation, labor shortages and rising interest rates. For an industry that thrives on certainty and predictability — on schedule, cost and more — these challenges have been a significant disruptor, requiring contractors, suppliers and clients to find new ways of addressing material shortages, shipping times and logistics management.

In navigating this changing landscape, procuring the right materials within budget and delivering them to the project site at the right time has become more crucial than ever to ensuring project success. And in many ways, it has changed the way the industry will operate going forward.

"Procurement is the single biggest source of cost uncertainty right now for our clients," said Andrew Gardner, president of Kiewit Supply Network (KSN). "A lot of people don't realize that materials and shipping costs are generally 50% of the cost of the job." He added, "Growing uncertainty around the availability of materials is driving pricing pressure up, and soon clients will find some projects aren't viable unless contractors and suppliers deliver solutions."

So what are those solutions? And how do projects manage risk in escalation, material shortages and shipping delays that are occurring across the entire industry?

"Procurement is an opportunity for Kiewit to be a comprehensive solutions provider for our clients, and it comes down to how we manage our supply network as a company," said Gardner.

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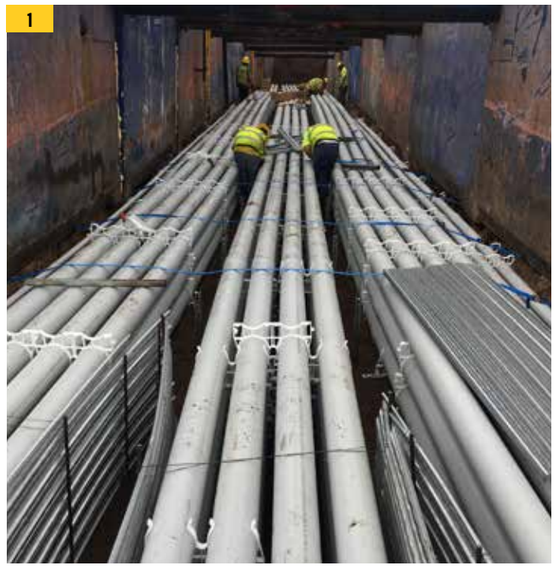


2

1. Kiewit employs a category management program to inform purchasing decisions across projects. 2. The generator step-up transformer pictured above was the largest unit the supplier had exported from Brazil to date.

Kiewit's supply network, as Gardner explains, is the sum of the company's resources, relationships and processes that enable the delivery of goods and services for clients. This can range from highly technical equipment to run-of-the-mill office supplies. In total, Kiewit spends more than $7 billion annually to procure materials for projects.

RELATIONSHIPS AND EXPERTISE

One of Kiewit's core responsibilities has always been effectively managing materials for its locations. Prior to 2016, procurement services were split across Kiewit's energy and infrastructure operations with teams focusing on those markets exclusively. In 2016, Kiewit centralized the data, resources and talent dedicated to procurement services to help make purchasing decisions across all markets and handle Kiewit's supply chain more efficiently and proactively.

Kiewit's dedicated workforce of procurement support staff has grown to over 380 people who provide procurement management tailored to the needs of each project. Within this group are subject matter experts experienced in import regulations, permit requirements for heavy haul transportation, logistics management, identifying and partnering with local, small and diverse businesses, and much more.

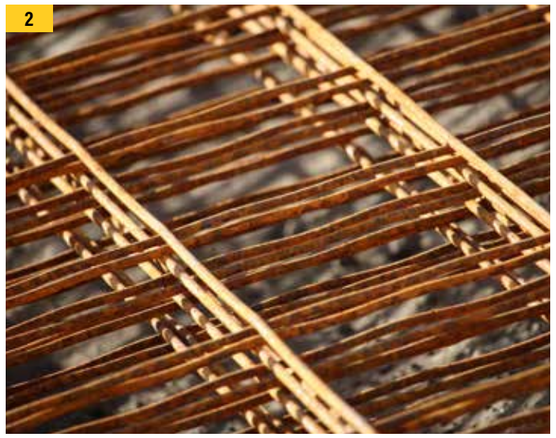
This team provides expertise to develop and maintain strong relationships with vendors, troubleshoot issues efficiently and share knowledge to support all of Kiewit's projects across North America.

Having procurement experts available to help when needed has become crucial to project success during challenging

Miles and miles

In a global economy where goods can be manufactured hundreds or thousands of miles away, transporting those items to a job site at the right time can be complex and potentially very costly.

During the heart of the COVID-19 pandemic, Kiewit Supply Network provided logistics support to expedite the shipment of three GSU transformers and related accessories from Sao Paulo, Brazil, to a project site in Illinois. The delivery route, crossing oceans and mountains, required multiple transportation methods to get these three units delivered and installed. Once involved, KSN's logistics team successfully led heavy-haul permitting in Brazil and supported supervision of delivery of the GSU transformers. Here's a look at the complex delivery route.



1. Material shortages impacting Kiewit's projects include rebar, cement, copper, electrical steel and steel pipe. 2. In total, Kiewit leverages more than $7 billion in annual spend to procure materials for projects.

times. Thomas Struchtemeyer, project manager for Kiewit Power Constructors Co., experienced this firsthand when he ran into delivery issues with equipment on the job.

"We ran into an issue with the delivery of several generator step-up transformers (GSUs) that were delayed coming from South America," he explained. In this scenario, this highly technical equipment could only be manufactured and procured from a limited number of experienced suppliers around the world.

On top of production delays, the supplier was having trouble coordinating heavy-haul transportation and obtaining the necessary permits to export the GSU units. The transformers were the largest units the supplier had exported from Brazil to date.

Receiving these units in a timely manner was imperative as the GSUs were "critical path," meaning construction could not proceed until they were installed.

To troubleshoot the issue, Struchtemeyer contacted Gardner's team for support. Once involved, KSN's logistics team successfully led heavy-haul permitting in Brazil by providing "boots on the ground" support and supervising delivery of the GSU transformers.

"If Kiewit didn't have this expertise internally, it would have been left to the project team to find solutions," said Struchtemeyer. "That's the beauty of having these subject matter experts at Kiewit. When I run into an issue, I call them, and they get the best people engaged to deliver solutions."

Gardner says it's challenges like these that show exactly what KSN experts are there for.

SOLUTIONS PROVIDER

Given the current environment, Kiewit has become more proactive in managing logistics and shipments, and helping suppliers and subcontractors with expediting delivery. With a strong and diverse supply base, the company has established strategic partnerships with vendors around the world to deliver projects. As with anything in construction and engineering, relationships are key.

"We understand that relationships are not only important with our clients but all the way through the supply chain," said Gardner. "Understanding what our suppliers can provide and where, knowing where their fabrication facilities are, knowing what volumes they can manage, and stepping in to help manage the risk, helps our projects succeed."

Kiewit has worked directly with suppliers to enhance design and equipment manufacturing. As one example, Kiewit worked with equipment suppliers for Heat Recovery Steam Generators (HRSG) and condenser equipment to optimize the design and shop fabrication to minimize the costs to assemble this equipment at the job site, ultimately saving the client money.

Gardner explained, "We work with organizations that can truly help us to get to the best value for our projects and bring the best value to our clients."

While production and shipping delays are constant challenges within the construction industry, they have worsened since the outset of the pandemic. Material shortages impacting Kiewit's projects include cement, copper, electrical steel and steel pipe.

Kiewit Project Manager Pegah Skarsgard has experienced numerous logistical and shipment challenges over the past two years. She explained, "Since the COVID-19 pandemic started, supply chain problems have been disrupting global shipping, which has resulted in shortage of containers and ultimately caused major schedule delays."

Skarsgard credits KSN for helping her teams overcome these obstacles. "They have been able to provide insight to marine transit, port operations and alternate shipping options, and engage a number of industry contacts to gain access to ports whereas field personnel would not have been able to."

Logistics and materials management has become a specialized skillset. Having people who understand global issues and know how to navigate disruption is not only helpful, but imperative to getting projects built in the current environment.

RISK MANAGEMENT

Despite the unexpected challenges of the past few years, Kiewit has responded with solutions to ensure current projects stay on track and future projects are set up and managed for success. KSN uses a category management system that provides supply intelligence to help make purchasing decisions for frequently purchased items such as structural steel, pipe, valves, fittings and concrete.

Whether it's hedging materials by buying for multiple jobs at once when possible, employing the category management program to inform purchasing decisions or working with long-time partners, Kiewit has developed an all-hands-on-deck approach to driving efficiencies.

While no one can predict future market dynamics, material shortages or inflation impacts, Kiewit has demonstrated it is prepared with the expertise in procurement to adapt and continue delivering successful projects. **K**

"We understand that relationships are not only important with our clients but all the way through the supply chain. Understanding what our suppliers can provide and where, knowing where their fabrication facilities are, knowing what volumes they can manage, and stepping in to help manage the risk, helps our projects succeed."

ANDREW GARDNER
President, Kiewit Supply Network

FIRED UP IN FLORIDA

A Florida power plant project marks notable firsts for client and vendor relationships.

"This has been the best job I've been on," said Mike Llerandi, mechanical superintendent for The Industrial Company, Inc. (TIC), a subsidiary of Kiewit.

The job he's talking about is the Seminole Combined Cycle Facility, a one-gigawatt, natural gas-fired power plant being constructed as part of an engineering, procurement and construction (EPC) contract.

Seminole is one of the largest not-for-profit generation and transmission cooperatives in the U.S. and provides wholesale electric service to nine not-for-profit distribution cooperatives that together serve approximately 1.9 million consumers and businesses in Florida.

It's located in Putnam County, in the northeast part of the state, about 30 miles inland from the historic city of St. Augustine.

It may be easy to presume Llerandi is referring to Florida's sunny weather or the abundance of local attractions — on the team's off hours, the job is also an easy drive to Kennedy Space Center, Disney World, Jacksonville and Tampa.

But he's most enthusiastic about the way the team has come together to build first-time relationships with project owner Seminole Electric Cooperative and several materials vendors, while creating a cohesive culture among the team.

'CONTROLLING OUR OWN DESTINY'

As the EPC contractor, TIC has self-performed much of the work normally subcontracted out, including civil work like initial dirt work and mass grading, and setting of heavy components and equipment.

Traditionally, if a third party is late delivering materials or equipment, the job not only can run behind but also incur late fees that quickly add up.

Self-performing this work gave the team more control over the schedule and costs. TIC had the heavy equipment and experienced personnel to handle important aspects of the job.

"This is work that's in our critical path. We'd rather do it ourselves and control our own destiny," said Rifat Kantarcioglu, project manager.

"We had the right people here early on the job, the right construction manager and superintendents who understood the work, so we said, let's attack it ourselves instead of subbing it out."

When the civil and dirt work was completed and it came

1. In total, the team carefully assembled and placed approximately 8,700 tons of equipment, including the turbines, generators, steam drums, transformers and HRSG modules. 2. The project team sets in place a turbine guided by a 716-ton crane.

time to set equipment like the boiler stacks and generators, and weld integral pieces like the isolated-phase bus duct — the critical conduit for a power generation facility — the team called on its boilermakers, ironworkers and welders.

Having a major 716-ton crane on-site that could handle the weight of the generators, turbine and other major components also helped save hundreds of thousands of dollars, said Llerandi.

"You're talking about components that weigh anywhere from 600,000 pounds to over 800,000 pounds," he said. "These are major high-dollar pieces of equipment that are very heavy."

The team was charged with creating rigging and lift plans and rigging the equipment themselves. Together, they carefully assembled and placed approximately 8,700 tons of equipment, including the turbines, generators, steam

Seminole is one of the largest not-for-profit generation and transmission cooperatives in the United States. Seminole provides wholesale electric service to nine not-for-profit distribution cooperatives.

drums, transformers and HRSG modules.

Does the fact that the team tackled this heavy lifting give them a special sense of satisfaction?

"Oh, 100%," Llerandi said. "Because we did it all ourselves."

BUILDING NEW VENDOR PARTNERSHIPS

As the team worked on preparing for the "buyout" — the time of the project when purchase orders and subcontracts are issued — they discovered some of their regular vendors were busy and wouldn't be able to meet delivery deadlines.

TIC saw it as an opportunity to build new relationships: Five first-time vendors were brought in to provide engineered equipment, pre-engineered metal buildings and major materials like structural steel and steampipe.

"Sometimes you've just got to push yourself out of your comfort zone and after you've done your homework, just take a leap of faith," Kantarcioglu said. "I think it paid off huge on this job."

A new condenser vendor saved the team field workhours by thinking outside the box: They shop-assembled and extensively tested the condenser before it arrived onsite.

The pre-engineered building subcontractor was local, which made it much easier to take care of issues as they arose because they were "right down the road," Kantarcioglu said.

Tyson Utech, piping general superintendent, was responsible for vetting the piping fabrication and valve vendors. The steam piping fabricator had previously done work in other areas but had not performed this scope on previous TIC projects.

"All of our other typical fabricators for steam piping had very little shop space and a large backlog," he said. "By doing our due diligence and making sure we helped them get to know the ropes of doing business with us, together we were able to ensure their success and avoid a several-month delay to the project by them delivering on time."

KEEPING THE OWNER INFORMED

When working with a first-time owner, there's always a "getting to know each other" period.

The team made sure to keep Seminole Electric's representatives informed and comfortable with the process before they hit boots on the ground.

Some keys to doing that, said Kantarcioglu, were inviting the owner to planning sessions, including engineering and procurement kickoff meetings.

"We also walked through those different phases of the project — how we do safety, how we do quality, how we do our engineering planning, how we build our schedules — as much as we could, hand in hand. I think that helped to ease some of their anxieties and concerns they may have had."

KEY TO SUCCESS

Utech, Llerandi and Kantarcioglu all credit putting the right people in the right jobs, keeping things simple and creating a family-like culture for making the Seminole Combined Cycle Facility a job to remember.

"I think everyone knew the focus was driving the project in the right direction to make sure the project was completed safely," Utech said.

"Whether it's a big operation or a small one, the right person was always there to assess the situation and make the calls. This ensured that we always moved forward, never backward."

The team has built an atmosphere, Utech said, where people have the time and know where they're supposed to be. This has been the most important part of the project: constructing the plant safely, while meeting client expectations and staying on schedule.

"You're spending a lot of time with these folks, and they really do become like your family," Llerandi said. "The team atmosphere has been great. Everybody out here is wanting to do what they can to be part of the team and help everybody out." **K**

The Seminole Combined Cycle facility is a one-gigawatt, natural gas-fired facility, featuring two General Electric combustion turbine generators (CTG), two heat recovery steam generators (HRSG) with reheat, one condensing steam turbine generator, a mechanical draft cooling tower, switchyard and associated balance-of-plant equipment. The CTGs and HRSG supplemental burners are single fuel-fired, using natural gas. As part of its contract, TIC connected the facility to the transmission system through an expansion of the 230-kilovolt switchyard.

The new power plant will also provide environmental benefits. Seminole expects to see significant reductions in emissions for its facilities in Putnam County, while increasing total power output.

LIKE CLOCKWORK

Portland's Columbia Boulevard Wastewater Treatment Plant receives major upgrades, increasing capacity and ensuring seismic resiliency.

Operating 24 hours a day and 365 days a year, the Columbia Boulevard Wastewater Treatment Plant serves the growing city of Portland by protecting public health and ensuring clean water quality in the region's rivers. The plant has a capacity of 450 million of gallons per day to handle waste and stormwater for the City of Portland, making it Oregon's largest wastewater plant.

Since opening in 1952, the plant has made significant progress in ensuring sewage, agricultural and industrial waste is properly processed to maintain water quality in the nearby Willamette River and Columbia Slough. To improve operations of the plant and increase capacity to keep up with population growth, the City of Portland saw the need to add additional clarifiers and improve facilities, including solids handling and loadout systems as well as associated electrical and piping, which were growing old and needed to be updated or replaced.

Muriel Gueisssaz-Teufel, program manager for the City of Portland, explained, "The Columbia Boulevard WTP Secondary Treatment Expansion Project (STEP) is the most significant investment in Oregon's largest treatment plant in 50 years. The project will allow us to meet our regulatory obligations with the Oregon Department of Environmental Quality, add significant operational and seismic resiliency to our treatment infrastructure and bring a significant part of our operations into the 21st century."

Given the size, complexity and many stakeholders involved, the City of Portland chose a Construction Manager/General Contractor (CMGC) approach to manage the project. This allowed for early contractor engagement and a high-level of collaboration to complete the plant improvements by the deadline established by the Oregon Department of Environmental Quality.

Kiewit Infrastructure West Co. took the lead on this project by serving as the prime contractor, leveraging Kiewit's capabilities in many areas including foundations, engineering, procurement and more, and pulling teams together from across the U.S. and Canada.

UPGRADING AN ACTIVELY OPERATING FACILITY

Managing a project of this scale while keeping the facility in operation 24/7 is no small feat. Planning, coordination and a strategic sequencing of construction activities was critical to keeping this project tracking forward.

Kiewit became involved when design was 15% complete. Engaging closely with the client and owner advisor early on allowed the team to complete pre-construction work like the insertion of storage facilities, locker rooms, office space and the removal of aspects that would soon be remodeled in future phases of the job. This early involvement saved both time and cost.

As construction began, the Kiewit team simultaneously worked on demolishing existing structures, installing temporary building facilities and preparing the site for the construction of permanent facilities.

Water was only shut off on rare occasions and only for short periods of time for major activities; Otherwise, plant operations continued around the clock. Project Engineer Jason Regier explained: "The only way to shut off water to the plant is through combined sewer overflow tunnels (CSOs), which can close the gates that let water into the treatment plant for a short period of time until the tunnels fill up. However, there's only eight hours' worth of storage."

Operating within these constraints, the team completed site updates including preparing the installation of new solids processing facilities, relocating critical utilities and control centers, making ground improvements and improving seismic resiliency across the plant.

Ground improvements completed by the foundation team included deep soil mixing and jet grouting to ensure all new structures could meet updated seismic standards and remain stabilized in the event of an earthquake. These ground improvement measures were critical to the success of the job.

SAVING TIME AND COST

One key process improvement on the project was the implementation of the Decision Action Resolution Team (DART) log process, which drove the value engineering discussion and resulted in significant cost savings.

The DART Log served as the project database for new concepts to be proposed and reviewed by stakeholders to benefit the overall job. The log provided a systematic approach to value engineering so collaborative ideas could be tracked and acted upon. This included suggestions on items such as design alternatives and changes to scope or constructability in multiple disciplines including electrical,

Ground improvement techniques, such as deep soil mixing and jet grouting, prepared the soil to ensure new structures were stabilized and met updated seismic standards in the event of an earthquake.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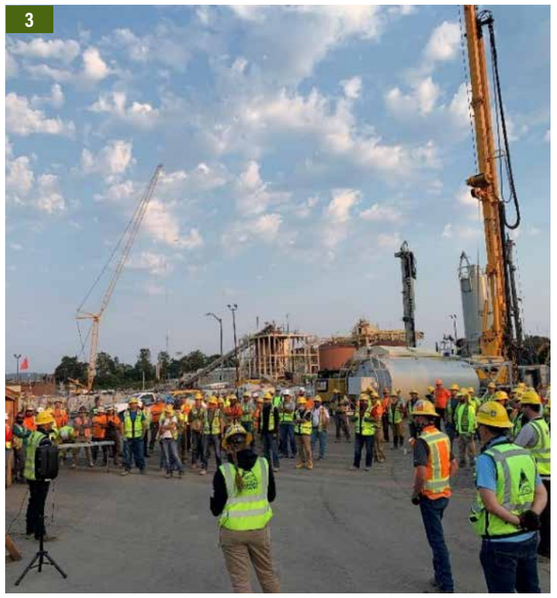
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architectural, civil and structures work.

Construction Manager Eric Johanson said, "The DART log is an example of how the CMGC model is supposed to work, where Kiewit is engaged as an industry expert to help with the design phase and project constructability. Ultimately, we came up with ideas to make the project safer to build and in a way that is less costly with less risk and schedule impact."

The Columbia Boulevard DART Log had over 90 accepted ideas and has saved over $111 million so far. In the category of seismic resiliency, there was over $9 million savings in approved and implemented DART suggestions.

Gueisssaz-Teufel added, "Kiewit has been particularly effective in bringing up value engineering options other team members, including the City, hadn't thought about."

Because of the overarching success of the DART log's usage on this project, Kiewit will continue to use the log on other alternative delivery projects.

BUILDING A DIVERSE TEAM

One element that encouraged the development of value engineering ideas was having a project-wide focus on teamwork, collaboration and diversity efforts. Diversity was a priority for the City of Portland early on. The CMGC method was chosen in part because of the opportunities it provided for increasing equity and diversity on the project team. This included contracting with locally certified businesses and apprentice programs for women and people of color in the construction phase.

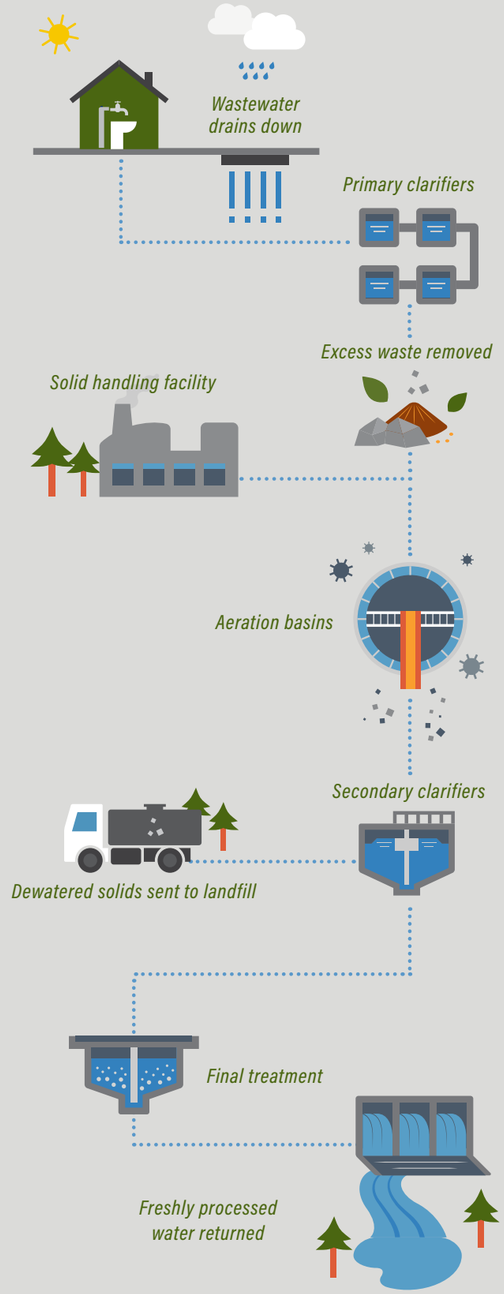
"Increasing construction contracting and workforce diversity is extremely important for the City, especially at this scale of a project," said Gueisssaz-Teufel. "We were able to keep a lot of contractors and apprentices working through the pandemic, where millions have gone to disadvantaged, minority, women-owned, emerging, service-disabled business enterprises while providing training opportunities to minority and women apprentices."

The Community Benefits Agreement (CBA) established by the City of Portland outlined goals for the small business workforce and apprenticeship percentages on the job. Kiewit continues to far exceed the apprenticeship, minority

1. Kiewit Engineering Group Inc. designed a SOE compression ring with reinforced interlocking secant piles to assist with seismic resiliency. 2. The project team completed select demolition activities on parts of the project that were to be replaced. 3. The Columbia Boulevard project was recognized by the Oregon Daily Journal of Commerce as a "Building Diversity 2022 Honoree".

What is the wastewater treatment process?

The Columbia Boulevard Wastewater Treatment Plant plays an important role in serving more than 600,000 customers every hour of every day. Working around the clock, operators manage incoming wastewater, ensuring the water is properly filtered and treated and then released into the Columbia River leading to the Pacific Ocean. Below is a bit of information about how this process works.



PRIMARY TREATMENT

Wastewater drains down the kitchen sink, dishwasher, toilet, bathtub, shower or washing machine of residents and businesses. Through a complex pipe network, water is transported to the treatment plant. Stormwater also enters the treatment plant via storm drains. Flowing through the headworks, large screens filter out objects such as leaves, rocks and trash.

The water then proceeds to the primary clarifiers, large tanks where the water sits to allow solids to sink to the bottom or be scrapped off the top.

From there, solids are separated and sent to the solids handling facility where they go through a dewatering process to reduce the solids down to dry material.

SECONDARY TREATMENT

Water undergoes a secondary treatment process by flowing into aeration basins. The basins are massive tanks filled with microorganisms that eat away at bacteria and other particles. The microorganisms depend on oxygen to survive, which is why blowers pump fresh air into the tanks regularly. From there, the water flows into the secondary clarifiers and repeats the process of allowing more solids to sink to the bottom or be skimmed off the top. The microorganisms are also removed in this process.

Solids are again separated and further dewatered. Once dewatered to a certain dry solids' percentage, these solids are loaded out in trucks and hauled to the landfill.

OUT TO NEARBY WATERWAYS

The water is then treated with sodium hypochlorite to kill more bacteria and dechlorinated to meet water quality standards. The freshly processed water is now considered reclaimed or recycled and can be returned to the nearby Columbia River or used for other recycled water uses, such as irrigation.

and female workforce goals on the job.

The team's focus on achieving and exceeding the CBA goals on the Columbia Boulevard Plant has turned the project into a model job for the City of Portland, illustrating how these goals bring value to the project.

"On the team we have people from all walks of life and that has brought a lot of good perspective and good ideas forward on the project," said Johanson. "We've rolled out many trainings on respect, inclusion, equity and building a harassment-free culture, which has helped make this project a positive place to work. When people feel heard and included, they want to come to work and perform at their best and that's been critical to our success."

As a result of the diversity efforts and achievements on this job, Kiewit was nominated by the Professional Business Development Group and recognized by the Oregon Daily Journal of Commerce as a "Building Diversity 2022 Honoree".

ON TRACK FOR SUCCESS

With a diverse project team and consistent follow-through on the project plan, the Columbia Boulevard Wastewater Treatment Plant expansion is on schedule to add the additional facilities and complete upgrades by December 2025. Combining the values of all the various project phases, this project will exceed $500 million and will be one of the largest wastewater treatment plants that Kiewit has constructed to date.

Once complete, these upgrades will go a long way toward ensuring the Columbia Boulevard Wastewater Treatment Plant can continue performing the essential services of treating and processing wastewater for many years to come. **K**

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ERIC JOHANSON
Construction Manager,
Columbia Boulevard
Wastewater Treatment Plant