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PARTNERS IN EFFICIENCY

Kiewit worked with the trenching equipment manufacturer to develop the optimal saw used for the I-17 Infrastructure project's long, linear microtrenching. This newly purchased equipment sets Kiewit up to support fiber and broadband expansion at the federal evel. Read more beginning on Page 12.



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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 \$3.7 billion and employs 25,700 staff and craft employees.

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KIEWAYS

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FINDING NEW WAYS TO MEET CHALLENGES

One of Kiewit's strengths has always been helping our clients and partners build jobs that solve problems or improve efficiency. From new, more innovative roads, bridges and buildings to cleaner energy sources and improved water treatment facilities, Kiewit successfully gets the job done.

This issue of Kieways highlights a few recent projects that required careful planning, unique approaches and a lot of hard work to be successful.

For example, learn about a first-of-its-kind advanced water treatment and recycling facility in Santa Monica, California. The new facility adds a drought resilient water supply of up to 1,600 acre-feet per-year of purified water, or roughly 10% of the city's total water supply. Read about this unique project and all its acronyms on Page 16.

On the opposite side of the country, residents in west central Florida are enjoying an upgraded power station that produces a new and cleaner source of energy. Kiewit teams were able to eliminate two coal-fired units at the Big Bend Power Station by implementing new combined-cycle technology. Read about it on Page 6.

Finally, this issue of Kieways includes a story about Kiewit's creative approach in helping the Arizona Department of Transportation save money and time through "micro-trenching" on the I-17 ITS infrastructure project, which is bringing hightech capabilities and connectivity to the roadway and providing greater infrastructure for rural broadband delivery. Read about it on Page 12.

At Kiewit, we take our purpose as a construction and engineering leader seriously. Among many things, our purpose is to help clients deliver infrastructure and energy projects that make the communities in which we live and work that much better.

I hope you enjoy this latest issue of Kieways.

RICK LANOHA

President and Chief Executive Officer

DIVERSIFYING WATER SOURCES The Advanced Water Treatment Facility purifies stormwater and wastewater into potable reuse standards to then enter Santa Monica's recycled water distribution system. Read about it on Page 16. AIE

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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
- (A) INDUSTRIAL
- MINING
- OIL, GAS & CHEMICAL
- Ø POWER
- TRANSPORTATION
- WATER

OUR VALUES:

- PEOPLE
- INTEGRITY
- **EXCELLENCE**
- STEWARDSHIP

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CREWS KICKED OFF PHASE 2 OF THE I-15 TROPICANA DESIGN-BUILD PROJECT Kiewit began Phase 2 of the I-15 Tropicana Design-Build project in Las Vegas.

This phase includes the demolition of two bridges — the I-15 SB flyover ramp to Tropicana eastbound and the Tropicana bridge over I-15.

The scope of the project includes replacing the existing interchange and structures to widen and lengthen the Tropicana Avenue bridge over I-15. Other improvements include adding HOV ramps, replacing the existing flyover and modifying the signalized intersection and configuration of Dean Martin Drive and Tropicana Ave.

Construction is expected to be completed in 2025.

KIEWIT TAKES CENTER ICE WITH THE NHL'S COLORADO AVALANCHE

In February, Kiewit kicked off its sponsorship of the 2022 Stanley Cup Champion Avalanche as the team's Official Construction and Engineering Sponsor. It's an exciting opportunity for Kiewit across the business, but also the greater Denver market, which is home to the company's regional headquarters and one of Kiewit's largest – and growing – employee populations.

One of the most significant components of the sponsorship is that the Kiewit logo will be the official decal on all Avalanche team helmets worn in games throughout the regular season and playoffs. The importance of connecting Kiewit's brand to the team's helmets was a crucial element of the partnership. The helmets tie nicely to Kiewit's safety culture, as well as its significant focus on mental health awareness – "what's under the hat" – for employees, their families and the broader industry.

This sponsorship will be closely tied to key recruiting efforts in the market, from military veterans to college recruits. The company also intends to use the sponsorship to support employee engagement programs, strategic business development and related client efforts.



KIEWAYS 2023 / Quarter 1

KIEWIT SELECTED AS DESIGN-BUILDER FOR PROSPECT LAKE CLEAN WATER CENTER

Plans are underway for a new drinking water treatment plant in Fort Lauderdale, Florida that will replace an existing 70-year plant and deliver the majority of fresh water for the city.

Kiewit has been selected to design and build the new Prospect Lake Clean Water Center, which will feature state-of-the-art technology and produce 50 million gallons of water per day (MGD). It will also be designed to withstand the winds of a Category 5 hurricane.

The new facility is the result of a public-private partnership between the City of Fort Lauderdale, IDE Technologies, LTD and Ridgewood Infrastructure. It is expected to be complete by 2026.

Kiewit will engage its in-house design team to serve as the engineer of record and utilize its construction-focused engineering approach to ensure that constructability is considered at each stage of the project. The company is also equipped to self-perform critical components of the construction work, helping to ensure on-time, on-budget project delivery.





MAKING CONNECTIONS IN NASHVILLE

Kiewit is excited to be a part of the new Broadway Bridge replacement in Downtown Nashville.

Here are the final design renderings from the Tennessee Department of Transportation. The project along State Route 1 consists of replacing the bridge that crosses over 11th Avenue and the CSX Railroad.

The new design will have six lanes of traffic and added space for pedestrians.

The existing bridge was constructed in 1948.

KIEWIT EMPLOYEE RECOGNIZED AS 2022 ALLIED IRON WORKER OF THE YEAR

Kiewit ironworker Jimmy Evensen has been recognized as the 2022 Allied Iron Worker of the Year for Local Union No. 361 in the New York City metropolitan area. Known for his wealth of knowledge and positive attitude, Jimmy is currently working on a bridge project in NYC.

"I'm very proud that I was nominated and even more proud that I won. It's a feather in my cap," said Evensen.

The award, officially known as Jack Daly Iron Worker of the Year, is a prestigious honor presented by Allied Building Metal Industries, Inc. (ABMI) to an ironworker that exhibits next-level leadership, ingenuity, safety awareness and innovative techniques. Jimmy first worked with Kiewit on the Atlantic Avenue Viaduct Replacement project back in 2008.

TAMPA POWER PLANT GETS MADE TO POWER PLANT GET

New combined-cycle technology increases output and eliminates the need for two coal-fired units at Big Bend.

Thanks to precision planning, hard work and collaboration, west central Florida residents can now boast of a power station that produces a new and cleaner source of energy.

The Big Bend Modernization project that wrapped up in December 2022, eliminated about half of the coal previously used at the Big Bend Power Station. The new state-ofthe-art combined cycle technology project is capable of producing 1,090 megawatts. That's enough electricity to power 250,000 homes.

The project was unique because it involved modernization of a 50-year-old existing coal-fired power station owned and operated by Tampa Electric Company (TECO). Prior to modernization, Big Bend had four coal-fired units in operation.

TIC – The Industrial Company (TIC), a wholly-owned subsidiary of Kiewit Corporation, was hired as general contractor to modernize the oldest of the four units, converting it from coal to natural gas using combined-cycle technology. The change not only eliminated the use of coal in Unit 1, but it also reduced the amount of wastewater. The increased efficiency of the combined cycle and the retirement of two additional coal-fired units will provide a reduction in CO2 emissions up to 3 million tonnes from the previous full coal-fired operation at Big Bend.



The project was not without its challenges. The team had to work within a small footprint, inside an existing coal facility that was operational with overhead power lines and selfperform major demolition work.

"Demolition is usually a smaller scope on projects like this, but we had over 55,000 hours of demolition work just to get the steam turbine building ready for the new equipment," said Kayla Sisk, project manager. "We pulled out lube oil modules, feed water heaters, electrical, transformers and piping galore," she said.

The demolition work took about 10 months and required extra coordination with the client and plant personnel to minimize the impact and disruptions to the existing facility, Sisk said.

In addition to the demolition work and installation of combustion turbines and steam generators, the team had to construct a pipe rack that was 2,500 linear feet long for the steam piping. To make it even more challenging, the pipe rack included three bridge sections that spanned a canal.

1. Crews remove an old feed water heater as part of the demolition work needed to prepare Unit 1 for new equipment. 2. Cranes were used to place sections of the 2,500-linear-feet of pipe rack in place over a canal.



"There were a lot of moving parts, a lot of different challenges throughout the process," said Construction Manager Robert Door. "We ended up assembling the pipe rack in sections and then used a large crane to place them."

OUTSTANDING SAFETY RECORD

Throughout the four-year project (three onsite), the team achieved every critical milestone. They finished 2.3 million hours worked (1.7 million craft hours) without a recordable safety incident, all in middle of the pandemic.

Sisk attributes this outstanding safety record to the culture established early on by Door.

"Safety has been ingrained in me ever since I started with TIC as a craft guy back in 1998," he said. "I always told myself that when I made it to construction manager, I would prove that we could do the job as safely as possible and still get it done," Door said.

Door believes in being a staunch advocate for his projects and his people. Getting out in the field and having conversations with everyone is vital to him.

"It's not just walking by," he said. "It's stopping and talking to people on the job, telling them why they need to do what they need to do and showing them."

TEAM EFFORT PAYS OFF

The Big Bend project wasn't like the typical combined-cycle plants TIC builds under an engineer, procure, construct (EPC) contract.

In this case, the team included:

- TECO owner, overall construction management and major procurement;
- Sargent & Lundy (S&L) design, engineering, procurement support and construction management support;
- GE supplier of two GE 7HA.02 gas combustion turbines and upgrade of existing steam turbine;
- TIC construction, commissioning and start-up.

TECO acted as construction manager for the project and, in addition to the above team members, had its own subcontractors performing work within the areas that had to be coordinated.

Area Manager Mike Burton said it was a team effort from the beginning of the project with all parties focused on common goals, including finishing on-time and recordable free.





3. Crews at the Big Bend project had zero recordable safety incidents during the three years spent onsite. 4. An overhead crane and bull rigging is used to perform a critical lift of the steam turbine lube oil module inside the existing steam turbine.

Protecting the manatees

The team faced a rather unique challenge on the Big Bend Modernization project — protecting the manatees.

Manatees are a threatened species and need warm habitats to survive. Tampa Bay's Apollo Beach, home to the Big Bend project, is a popular gathering spot for these large marine mammals in the winter months because water from the bay that is used to cool the Big Bend Power Station is then circulated back into the bay as clean, warm water.

With such a large number of manatees migrating to this area, Tampa Electric built a Manatee Viewing Center, a state and federally designated manatee sanctuary open to the public from November to April. Although no longer listed as an endangered species, the manatees (also known as Florida's gentle giants) still face many dangers, including loss of habitats. According to the Marine Mammal Commission, their slow speed and relatively high buoyancy make these "sea cows" vulnerable to boats. More manatees are killed as a result of boating accidents than any other single cause.

The project team at Big Bend had to take special precautions to protect the manatees.

"We had to make sure there was a manatee watch person when we were building the pipe bridge over the canal," said Project Manager Kayla Sisk. "If a manatee was spotted coming into the canal, we would need to stop work." Manatee watchers were also on duty anytime boats were being used.

The team had strict material handling procedures to make sure nothing was dropped into the water that manatees could eat or that could harm them. As it turned out, none of the manatees came close enough to the work area to force a shutdown.





"It was a complex project and collaboration was crucial," he said. "We all worked as a team with daily coordination on all aspects of the job."

TIC brought its EPC mindset to the project.

"There were a lot of things we knew we could do better or faster or cheaper," said Sisk. "We were very vocal about those ideas, and I think they respected us for that."

Kris Stryker, senior director of Decarbonization Major Projects at TECO, said TIC was selected for the project because of its experience constructing plants using advanced technology gas turbines, experience that turned out to be valuable to the project.

"TIC was an excellent partner on the project, helping us resolve issues even outside their scope, and we were always able to come up with collaborative and creative solutions to the challenges," said Stryker.

Another factor that set TIC apart was its safety culture and performance. "TIC definitely lived up to the sales pitch in this area by completing the project with zero recordables," he said.

"I am most proud of our client relationship because we had a very engaged client with high expectations," said Sisk. "To be successful, we needed to listen to their concerns and make sure we understood and addressed them." **K**

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"TIC was an excellent partner on the project, helping us resolve issues even outside their scope, and we were always able to come up with collaborative and creative solutions to the challenges."

KRIS STRYKER

Senior Director Of Decarbonization Major Projects, TECO

INNOVATION ON THE ROAD

Faced with a challenging Arizona landscape, the I-17 ITS Infrastructure project team created an innovative workaround one that's also paved the way for future contracts.





On Interstate 17 from Phoenix to Flagstaff, Arizona, there's plenty of rough terrain and congested traffic. Motorists on the route must keep an eye on the busy road as they encounter narrow lanes and a mountainous landscape with an elevation change of about 1,300 feet.

In 2021, Kiewit was tapped to be the Construction Manager at Risk (CMAR) for a 67-mile project for the Arizona Department of Transportation (ADOT). The job: Install highspeed/capacity fiber optic backbone infrastructure that will be used for interconnecting Intelligent Transportation Systems (ITS) field devices and providing infrastructure for rural broadband.

The technology allows ADOT to monitor traffic flow via connectivity to cameras, closed-circuit televisions, digital message signs, ramp meters and flow detectors — with a constant eye on addressing traffic congestion and collisions. It also brings high-speed internet to previously underserved and unserved communities.

As the CMAR, Kiewit would not only be responsible for the construction, but would also bring its expertise, in partnership with the owner's designer, to provide a constructible, fast and cost-effective solution.

GETTING CREATIVE

Looking at the initial design plans and providing preliminary cost estimates, the team quickly discovered that trenching through the rocky, mountainous terrain to install the infrastructure posed a particular set of hurdles.



1. Conduit was installed on steep, mountainous terrain through off-road trenching alignment 2. Crews use a rocksaw trencher and actively check the depth of the trench prior to placing the conduit.

"We recognized early on that the job was initially designed for the conduit to be installed off the shoulder of I-17 for a majority of the project length," said Project Manager Brian Hamilton.

"Our team identified a significant amount of risk with performing off-shoulder trenching on this specific stretch of I-17. There's a lot of rock in the area and that presents issues anytime you're trying to trench, because you not only have to create access to work, but also saw through the rock. You're going to spend more time preparing the areas and

n r



The CleanFast truck, conduit installation crew and slurry backfill crew worked together in sequence as a continuous convoy. This minimized impacts to traffic and accelerated production — resulting in the crew installing 360,000 feet of conduit in four months.

installing the conduit, so your overall cost is going to be higher."

To be able to build what ADOT envisioned and do it on budget, the team had to get creative. What if they moved the trench from off the shoulder to *in* the shoulder?

LESS COSTLY, MORE EFFICIENT

The team was familiar with an installation method called microtrenching. This concept had been developed in Europe and was relatively new to North America; it was just being introduced in the United States.

The method held promise. It could be done with a narrow and relatively shallow trench. Working in the interstate shoulder would mitigate the risk of encountering rock and other obstructions like roadway signage, lighting and drainage.

Even better, it was less costly.

"We had zero experience with microtrenching," said Area Manager Nick Wiatrowski. "The majority of our research for this installation was done on projects in Europe."

The team put their heads together to gather as much information as possible, knowing this wouldn't be business as usual.

"Generally speaking, transportation departments avoid

routing utilities underneath the roadway. The preference is to route them on the side of the roadway, and out of the way," said Hamilton.

Kiewit partnered with the designer and ADOT to work through a new concept of installing a trench into the shoulder — very narrow in width and at a shallow depth.

The team also planned to install a multi-microduct conduit in the trench with capacity for up to seven different fiber optic cables. This microduct worked well with the microtrenching solution, not only providing an avenue for ADOT's fiber optic network but also for future communication companies to use the space for broadband.

"It was a win-win, being brought on board early on, to where we could shape the design and provide good constructability feedback to ultimately come up with the best design at the lowest project cost," said Hamilton. "The department listened and was open to our feedback."

A STRATEGIC MOVE

Working with Tesmec, the trenching equipment manufacturer, the team created an innovative way to cut a trench just 3-1/4 inches wide and 14 inches deep. The team worked with Tesmec's sales and engineering groups to determine the optimal saw dimensions for the project and established an onsite training program to train Kiewit's operators. Equipped with dust mitigation capabilities and onboard spoil handling containment technology, the Tesmec CleanFast truck sucks up the dust and material as the equipment saws through the asphalt pavement and aggregate base course, creating a clean solution.

Believing in the effectiveness of the system and betting the investment would pay off for future roadway jobs, Kiewit made the decision to purchase two CleanFast trucks.

It was a strategic move for the organization, knowing there was a program in place in Arizona for similar work, and support for fiber and broadband expansion at the federal level.

"We've seen with the Infrastructure Investment and Jobs Act that broadband was a big initiative across the United States," said Wiatrowski. "Our ability to purchase the equipment that we need and learn new technology to construct the work helps us to diversify our company."

SETTING THE BAR HIGHER

"Contractually, we couldn't place our first traffic control device until 7 p.m. and were required to have all traffic control devices off the road by 6 the following morning," said Hamilton.

That created a tight work window for the team. But every day, beginning in Jan. 2022, team members challenged themselves to set the bar a little higher, ultimately bringing the job in ahead of schedule.

1. Two CleanFast trucks were purchased to support this project and diversify Kiewit's capabilities. 2. The southern segment of the project required work during night closures. Reflective personal protective equipment and halo lighting on the crew's hardhats was utilized to improve visibility.



"This method of long, linear microtrenching was new to the company and there was no previous roadmap established for how to efficiently complete this type of work," said Hamilton. "Our crews celebrated when they achieved new production goals, but the team was never satisfied and always motivated to install more."

"The repetitive nature of this work allowed the team to brainstorm and challenge each other to figure out a faster way of putting the conduit in the ground. The overall concept was simple, but we were able to make adjustments along the way to improve production and quality throughout the entire project."

Kara Lavertue, resident engineer for the ADOT Northwest District, praised the team's ability to respond to questions in the field and resolve issues quickly. She noted that Kiewit's work will continue to pay dividends.

"The work done on this project will benefit the state immensely," said Lavertue. "The project helped bring fiberoptic broadband to northern Arizona and will serve the citizens in remote areas." **K**



IN CASE YOU MISSED IT (ICYMI): SWIP IS FIRST OF **ITS KIND**



ICYMI: Santa Monica, California, recently celebrated the opening of a first-of-its-kind advanced water treatment and recycling facility that adds a drought-resilient water supply of up to 1,600 acre-feet per-year of purified water, or roughly 10% of the city's total water supply.

Kiewit Infrastructure West Co. led construction efforts on the project, known as the Sustainable Water Infrastructure Project (SWIP).

You can learn a lot about SWIP by learning a few more acronyms. Get to know some interesting details about this unique project and add a few terms to your vocabulary.

WHAT IS THE SUSTAINABLE WATER INFRASTRUCTURE **PROJECT (SWIP)?**

SWIP is the city's \$96 million project for its stormwater harvesting and advanced water treatment and recycling facility that collects, treats, and combines brackish groundwater, stormwater, dry weather urban runoff and municipal wastewater to restore local groundwater supplies. It is the first stormwater harvesting project in California to meet potable reuse standards and directly inject the treated stormwater into the groundwater aquifer.



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1. Regional officials celebrate the opening of SWIP at a ribbon-cutting ceremony. 2. This photo shows the completed Advanced Water Treatment Facility, or what's visible of it from the streets of Santa Monica. Due to its proximity to the beach, parking couldn't be eliminated to make way for the facility, so building the plant underground at the site of an existing parking lot was the best option. Now that the facility is complete, there's still a parking lot in the same location.



SWIP allows Santa Monica to manage its water supply using sustainable and environmentally friendly methods. Treating stormwater and wastewater to reuse standards diversifies the city's water portfolio. That has significant importance given the severity of drought in California. Capturing the initial stormwater flows, which are typically the most polluted, and preventing them from entering Santa Monica Bay, will improve the ocean's water quality.

MILLION GALLON PER DAY (MGD)

The AWTF can treat 1.2 million gallons of wastewater per day (MGD). The plant's original design capacity was 1 MGD, but the project team identified an opportunity to increase to 1.2 MGD during preconstruction.

PROGRESSIVE DESIGN BUILD (PDB)

SWIP used a progressive design build (PDB) contract model. A PDB team of Kiewit Infrastructure West Co., Kiewit Engineering Group Inc., and subcontractors PERC Water and Arcadis, worked with the city of Santa Monica to complete the project. The PDB delivery method brings the





The Advanced Water Treatment Facility can treat up to 1.2 million gallons of wastewater per day.

team and the client together in preconstruction. They work to understand project end goals and identify innovative solutions that optimize the right combination of cost, schedule, and risk transfer between parties.

Within the PDB team, Kiewit was responsible for all construction; engineering and design for all the structural concrete for the AWTF; and overall design management among all parties.

"Kiewit is great partner for Santa Monica's one-of-a-kind complicated project," said Santa Monica City Engineer Alex Nazarchuk, P.E. "City staff enjoyed working with Kiewit's field construction personnel who are very professional and are a truly great fit for this project."





Kiewit's workforce on the project peaked at 13 staff and nearly 70 trade craft employees. Subcontractors brought the total craft workforce to nearly 100.

Kiewit Project Manager Arturo Kaloyan will remember SWIP for the great team effort between the PDB team and the city of Santa Monica.

"We had a really good project team, one where we all worked together toward a common goal," Kaloyan said. "When we had hiccups, we took a collaborative approach to ensure the success of the project. We had a lot of fun doing a really successful job."

COVID-19 - YES, THAT'S TECHNICALLY AN ACRONYM

SWIP's construction ran from 2020 to 2022, during the peak of the COVID-19 pandemic. The project was designated as essential work, so construction continued.

Santa Monica's economy centers on tourism. City streets were mostly empty during the worst of the pandemic. As a result, the city allowed construction to open street work earlier and with less restrictions than planned. This accelerated the project schedule and minimized impacts to the public.

"Working together through hard times during the pandemic helped solidify the teamwork between us — the city, our engineering partners and Kiewit," said Project Sponsor Julien Jeannel. "The strong team we developed during the early months of the pandemic ensured we could successfully meet any challenges we encountered in the future."

RECOGNIZED FOR OUTSTANDING WORK

In early 2023, SWIP applied for Envision Platinum distinction. The Institute for Sustainable Infrastructure oversees Envision certifications, which recognize the sustainability and resiliency of civil infrastructure. Platinum is the highest distinction.

Sustainable construction practices are criteria considered for Envision certification. On SWIP, this included:

- Balancing earthwork By stockpiling the material that was excavated onsite for later use as backfill dirt, more dirt didn't have to be imported to the site. This eliminated truck trips and the associated air emissions, noise and wear on city streets.
- Waste diversion

Mitigation of fugitive dust and sound pollution

The American Public Works Association (APWA) Southern California Chapter named SWIP its Best Project of the Year Award recipient for Water/Wastewater Projects \$50 million to \$100 million. The American Council of Engineering Companies (ACEC) California Chapter presented SWIP its Honor Award, recognizing engineering excellence. SWIP is now a contender for national-level awards from both organizations. **K**

