Kiewit

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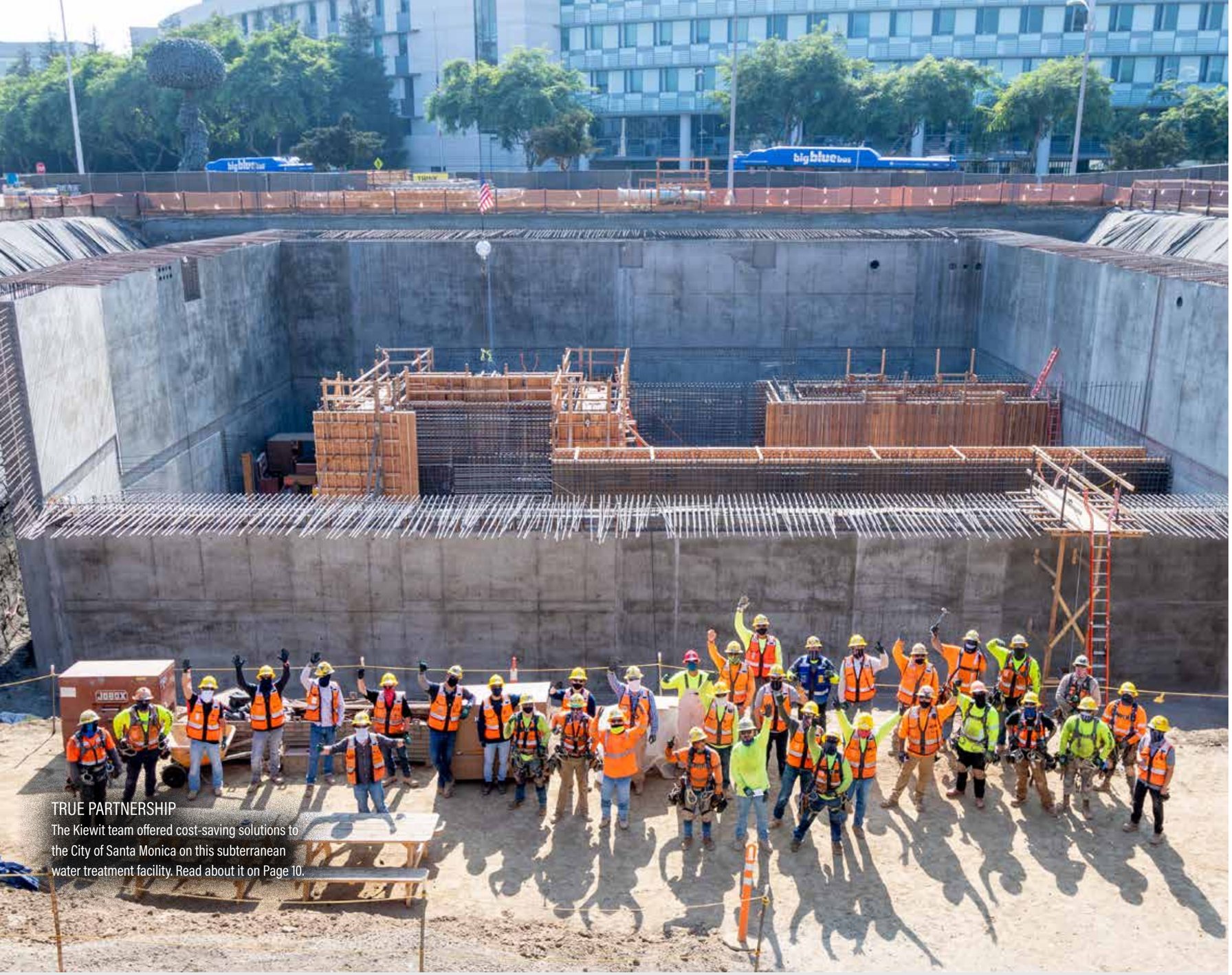
SINCE 1884

the magazine of kiewit corporation

2021 / Quarter 4

KIEWAYS

SOLUTIONS THAT MATTER



TRUE PARTNERSHIP
The Kiewit team offered cost-saving solutions to the City of Santa Monica on this subterranean water treatment facility. Read about it on Page 10.

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 2020 revenues of $12.5 billion and employs 27,000 staff and craft employees.

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KIEWAYS
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FOCUS ON SOLUTIONS LEADS TO SUCCESS

Early in 2021, I challenged our Kiewit team to make sure we are focused on and committed to being the premier solutions provider to our clients, partners and other key stakeholders.

This issue of Kieways showcases Kiewit people doing exactly that. We've highlighted nine different teams that worked with clients and other partners to solve serious, important challenges and find innovative ways to keep projects on time and within budget.

A great example is the Kingston Third Crossing project in Kingston, Ontario. On Page 22, read about how the Kiewit team proposed replacing a trestle with a causeway, an approach the client attributes to the project's success.

On another Canada project, the Kiewit team saved significant time and money with a solution that replaced a planned four-gate spillway downstream from an existing dam with a plan to add four gates to the existing dam. Read about the impact this solution had on the project on Page 16.

Two water treatment plants in California also realized significant benefits from solutions offered by the Kiewit team. Using a relatively new Progressive Design Build contract model, the team was able to offer numerous solutions in the preconstruction phase, from alternative technical concepts and design approaches to creative temporary engineering solutions. Read about them on Page 10.

There are too many great stories in this issue to mention here. But I hope you enjoy reading how our teams helped unlock and deliver solutions that not only improved project outcomes and satisfied our clients, but also had a major, positive impact in communities. They are all strong examples of listening to understand what success looks like for clients and partners, and what Kiewit can do to help them achieve that success.

Thanks to everyone who helped make these solutions possible. Stay healthy and safe.

RICK LANOHA
President and Chief Executive Officer

ON THE COVER

SOLUTIONS PROVIDERS

This issue of Kieways focuses on some of the many projects that demonstrate Kiewit's ability to listen to partners and provide solutions that matter.

INSIDE

INNOVATION IN A CRISIS

Kiewit teams mobilized quickly to brainstorm innovative ways to repair the I-40 Hernando de Soto Bridge after a fracture was discovered, forcing the bridge to be closed to traffic. Read about it on Page 6.

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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HICKORY RUN ENERGY CENTER EARNS TOP PLANT AWARD

Hickory Run Energy Center is a POWER Magazine Top Plant Award Winner. The plant is a 1,000-megawatt, natural gas-fired, combined-cycle power plant, capable of generating reliable power to 1 million homes. POWER Magazine presents its top plant awards to "interesting, important and innovative projects." Many of the award-winning plants are "recently commissioned facilities that exhibit some unique design or technology that will be of general interest to the power industry."

KIEWIT AND THE THURGOOD MARSHALL COLLEGE FUND PARTNER TO PROVIDE SCHOLARSHIPS AND INTERNSHIPS

A new partnership with the Thurgood Marshall College Fund (TMCF) will support Kiewit's continued efforts to recruit a more diverse talent pipeline.

Through the partnership, Kiewit will provide 20 engineering and construction management students from Historically Black Colleges and Universities (HBCU) with an immersive two-day company experience. The experience will include opportunities to learn about Kiewit's culture, meet employees, engage with executives, and learn about what a day in the life is like at Kiewit and in the construction and engineering industry.

Of the 20 initial participants, 10 students will be selected for Kiewit internships and $10,000 scholarships, based on financial need. TMCF and Kiewit will partner to create the student requirements and TMCF staff will assist Kiewit in identifying top talent from HBCUs.

THANK YOU, VETERANS

VETERANS COMMUNITY PROJECT

In honor of Veterans Day, Kiewit donated $10,000 to Veterans Community Project. The Kansas City-based organization is committed to eliminating veteran homelessness by providing transitional housing and enabling access to exceptional service solutions. Veterans Community Project has begun expansion beyond its Kansas City origins, with a goal of serving eight communities by 2022.

Kiewit is committed to supporting veterans and grateful for the many veterans who work for the Kiewit organization, bringing their technical proficiency, discipline, team spirt and leadership skills to a wide variety of roles.

NEARLY 100 COLLEGIATE WOMEN ATTEND KIEWIT SUMMIT

Ninety-seven collegiate women studying construction and engineering attended the two-day Annual Future Women in Kiewit Summit at Kiewit University in Omaha, Nebraska, in October. More than 800 women from the United States and Canada have experienced a version of this event over the past 10 years.

Attendees participated in peer networking events and heard from a variety of leaders about Kiewit's culture, opportunities, safety standards, industry differentiators and emerging markets.

Highlights also included talks on behavior-based leadership, confidence, and a candid panel Q&A with women across Kiewit's construction and engineering districts.

LENDING A HAND TO HABITAT FOR HUMANITY

Kiewit employees in British Columbia participated in a Greater Vancouver Habitat for Humanity Build Day in October. The group helped with exterior and interior painting, moving materials, framing, installing windows and other miscellaneous construction activities. The team also did an extensive site clean in keeping with our practice of extreme housekeeping.

Habitat for Humanity works with families in need to build safe, decent and affordable housing. Homes are built through volunteer labor and donations of money and materials. Families with children are selected for each home, and must volunteer 500 hours before they move in. These homes will provide the transformational opportunity for the selected families to move beyond financial uncertainty and ensure they have an affordable place to raise their families.

In addition to volunteering for the day, the local Kiewit team donated $10,000 to Greater Vancouver Habitat for Humanity to support local families and break the cycle of poverty.

I-40 HERNANDO DE SOTO BRIDGE | MEMPHIS, TENNESSEE TO WEST MEMPHIS, ARKANSAS

WHAT TEAMWORK AND INNOVATIVE THINKING CAN ACCOMPLISH IN A CRISIS

On Tuesday, May 11, 2021, Arkansas Department of Transportation (ArDOT) inspectors discovered a fracture on the Hernando de Soto Bridge.

Officials immediately halted vehicle traffic on the roadway and ship traffic below it on the Mississippi River as they assessed the damage. The 50-year-old bridge connects Memphis, Tennessee, to West Memphis, Arkansas, via Interstate 40.

By May 14, the Tennessee Department of Transportation (TDOT) released a request for proposals (RFP) for repairs to the bridge. On May 17, TDOT informed Kiewit Infrastructure South Co. it had won the job.

Over the next 11 weeks, Kiewit crews worked around the clock alongside TDOT and ArDOT officials, TDOT consultant Michael Baker, Inc., ArDOT consultant HNTB, and many other partners to complete temporary and then permanent repairs. Leveraging the collective knowledge and resources of the entire Kiewit organization helped safely reopen the bridge to traffic only 83 days after the crack's discovery.

A TEAM OF EXPERTS

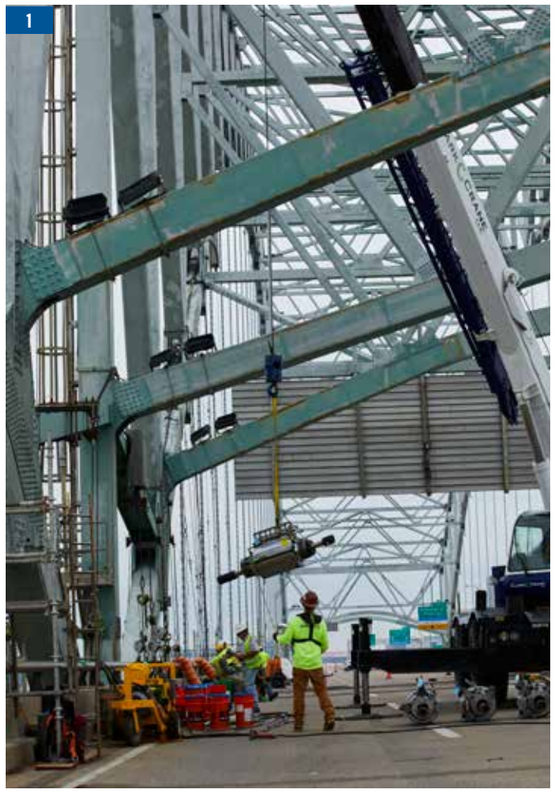
Less than three hours after receiving the RFP, 10 Kiewit personnel were discussing an approach to the repairs. Thirty more colleagues joined a call the next day. Senior operations leaders from across the country and bridge engineers from Kiewit Infrastructure Engineers were some of the key participants who helped brainstorm construction methods and provide solutions to the client.

MOVING WORK OFF THE WATER

TDOT initially anticipated repairs would have to be done from the water with manlifts and cranes. Kiewit's pursuit team engaged several employees from the company's East Coast operations, where repairing aging and structurally deficient bridges is common. Based largely on this experience, Kiewit proposed an alternative of performing the repair from a platform attached to the bridge deck, resulting in a faster and safer repair.

When it came to the permanent repair, Kiewit's preconstruction team saw significant risks with the stability of the bridge during the removal and replacement of the fractured member. The team worked with internal experts to develop alternative repair options. Kiewit shared the ideas with TDOT, ArDOT, Michael Baker, Inc. and HNTB, discussing together the best solution to repair the bridge and maintain the safety and stability of the structure.

1



1. A post-tensioning jack is hoisted into place. 2. A view of the work zone at night. The job team worked around the clock to complete the repairs. 3. Kiewit staff team members Jordan Gregg, Dave Kowalski and Scott Ritter review construction plans.

3

2

The collaboration resulted in a permanent repair plan of strengthening the member with plates and avoiding safety and constructability risks.

"We selected Kiewit. We thought they had a good approach and a good plan," said TDOT Director of Construction Brian Egan. "They actually addressed working from above and how they would do that from the bridge and did their own analysis. They proved to be very, very good to work with and competent and capable to provide that assistance in design and obviously to expedite the construction."

Ultimately the project required three phases of construction to stabilize the bridge, repair the fracture and strengthen additional locations.

QUICK ARRIVAL OF PEOPLE, EQUIPMENT AND MATERIALS

Once the project was awarded, people, equipment and materials started arriving to the Tennessee/Arkansas border.

"From the time they put out the RFP, we were basically working seven days a week around the clock," Kiewit Infrastructure South Co. Vice President Chris Frieberg said. "As soon as we were selected, we started mobilizing and getting people to the site."

Staff and craft came from around the country. Local supervisors like Jordan Gregg, who knew the area and the client, were joined by supervisors Dave Kowalski and Alex Gioseffi with experience in bridge repair work.

Working from the bridge deck instead of the water wasn't just safer and easier, it required less equipment. Instead of towing a barge from hundreds of miles away, crews coordinated delivery of smaller equipment from nearby.

"We used generators, compressors, man lifts and chain hoists primarily," Frieberg said. "We were able to use the bridge itself as our hoisting mechanism to minimize the amount of equipment we needed throughout the job."

RELATIONSHIPS MATTER

Existing relationships were crucial to the job's success.

Kiewit was counting on material suppliers and subcontractors to support the fast-paced project. In some cases, Kiewit's experience with those firms spanned 20-30 years or more.

"In the current environment, it's difficult to get materials and we knew our subcontractors and suppliers were busy," Frieberg said. "They did everything they could to deliver whatever parts, pieces and services were needed to make things happen. These long-term relationships really helped us. We were able to put a lot of faith in them to be able to tell our client we'd be able to deliver on schedule."

Longstanding relationships with both TDOT and ARDOT were also important. Kiewit has completed many projects for both clients and was actively working on others during the Hernando de Soto repairs. The Construction Manager/General Contractor (CMGC) contract model worked well for other projects and was used for the repairs.

"CMGC puts us in a collaborative environment with the client and the designer," Frieberg said. "They were open to our ideas. We were open to their ideas. We all worked to come up with the right solution and implement it quickly. I think the delivery model is a primary reason we were successful."

INCREDIBLE FIX COMPLETED

On May 11, the discovery of the crack put a national spotlight on the deterioration of U.S. infrastructure. Even Secretary of Transportation Pete Buttigieg visited the bridge, highlighting the concern, but was appreciative of the work underway.

On Aug. 2, 83 days later, with traffic flowing again, the spotlight was on what teamwork and innovative thinking can accomplish in a crisis. The repairs are permanent and anticipated to ensure full-service life of the bridge.

Kiewit's Chris Frieberg explains the repair procedure to Secretary of Transportation Pete Buttigieg and Federal Highway Administration Administrator Stephanie Pollack and TDOT Commissioner Clay Bright.

"Kiewit Infrastructure's involvement was instrumental to the success of the I40 Hernando de Soto Bridge repair with safety at the forefront and schedule close behind. Their execution was excellent," said TDOT Commissioner Clay Bright.

"It was a challenging job, but you really feel there's a ton of importance on what you're doing to come up with the right solution," Frieberg said. "Every one of our people felt the same way and volunteered to come help because they wanted to be part of something so important. We're proud to deliver projects like this for our clients." **K**

Timeline of events

DAY 1

BRIDGE CLOSED

On May 11, a bridge inspector identifies fracture. Bridge is closed to vehicular traffic and maritime traffic below is suspended.

DAYS 2-7

TDOT SELECTIONS

On May 12, TDOT selects the designer. Over the next five days, contractors are solicited and selected.

DAYS 2-15

PHASE ONE

Team works on design to stabilize the fracture May 12-21. Construction occurs May 20-25.

DAYS 3-59

PHASE TWO

Team works on design to repair the fracture May 13-June 18. Construction occurs May 29-July 8, and includes de-tensioing the bridge, strengthening and tensioning the repair.

DAYS 22-47

INSPECTION/ INVESTIGATION

Concurrent with the Phase 2 repair, ARDOT performs an extensive weld inspection program and determines additional strengthening locations.

DAYS 48-83

PHASE THREE

Design to provide additional strengthening occurs June 27-July 20. Construction occurs July 5-Aug. 1.

DAY 82

WESTBOUND LANES OPEN

Westbound lanes open to traffic on July 31.

DAY 84

EASTBOUND LANES OPEN

Eastbound lanes open to traffic on Aug. 2.

SWIP PROJECT | SANTA MONICA, CALIFORNIA

NORTH HOLLYWOOD | LOS ANGELES, CALIFORNIA

NEW CONTRACT MODEL PROMOTES COLLABORATION

Using a relatively new Progressive Design Build (PDB) contract model led to increased collaboration, more innovative solutions, better designs and more accurate estimates and schedules on two recent water projects in Southern California.

What's different about the PDB model is the preconstruction phase where contractor and client come together to understand project end goals and identify innovative solutions that optimize the right combination of cost, schedule and risk transfer between the parties.

Contract price, schedule and terms are not fixed until the design is 60% to 100% complete, according to William Searles, vice president of preconstruction services for Kiewit Water Markets and Strategy.

"As you progress through the scope generation and design phase, we don't have the pressure of operating under a fixed price or schedule," he said. "That frees us up to be a solutions provider, to bring ideas, to be able to really understand what the client is looking for, what their end goals are for the project and what their budget is."

At some point when the design is at least 60% complete, the client and contractor decide the scope of work is fixed enough where risk can be transferred from client to contractor. They settle on a Guaranteed Maximum Price and issue a contract amendment for the construction phase of the project.

SWIP PROJECT IN SANTA MONICA, CALIFORNIA

Kiewit Infrastructure West Co. led preconstruction services on the $88 million Sustainable Water Infrastructure Project (SWIP) for the city of Santa Monica and was then selected to complete the construction. The PDB model allowed the company to identify several client cost-saving solutions early in the design process, including:

- A way to use the city's existing storm drain infrastructure and construct a stormwater storage tank at the main site rather than design and build new tanks at two different sites. This eliminated four stormwater tie-ins and avoided the need to lay stormwater pipe under a live light rail track. The solution saved the client $5 million and eliminated the need to close a popular public park for 18 months.
- A recommendation to replace a 4.5-million-gallon stormwater harvesting tank with a 1.5-million-gallon tank to keep the project within the client's budget.
- Creative temporary engineering solutions for excavation, shoring, and process tie-ins.

"On the SWIP project, Kiewit has been our partner throughout the project," said Alex Nazarchuck, city engineer for the city of Santa Monica. "They've taken on our challenges and problems like they were their own and worked with us to solve them."

That's the beauty of the PDB model, according to Searles.

"Kiewit's goal on these jobs is to be a solutions provider, a trusted advisor to the client," he said. "Regardless of the contractual relationship, we've failed if the client believes we aren't acting in their best interest or focused on their needs, goals, and desires."

> "On the SWIP project, Kiewit has been our partner throughout the project. They've taken on our challenges and problems like they were their own and worked with us to solve them."
>
> **ALEX NAZARCHUCK**
> City Engineer,
> City of Santa Monica

Crews install underground piping and electrical systems in addition to the granular activated carbon (GAC) vessel support columns (shown in the foreground) on the Tujunga site. The North Hollywood and Tujunga plants will extract water from two sets of existing, non-producing groundwater wells, treating 50 million gallons a day and 25 million gallons a day, respectively.

NORTH HOLLYWOOD CENTRAL AND TUJUNGA WELL FIELD RESPONSE ACTION TREATMENT FACILITIES IN LOS ANGELES

A second water job in Southern California is proving to be another PDB win. The North Hollywood Central and Tujunga Well Field Response Action Treatment Facilities project is part of Los Angeles Department of Water and Power's (LADWP) comprehensive, long-term plan to replenish and store contaminated groundwater at sites across the 175-square-mile San Fernando Groundwater Basin.

Kiewit Infrastructure West Co. won the $456 million contract for design, engineering, permitting, construction, and commissioning. In the preconstruction phase, Kiewit brought $52 million in alternative technical concepts to the table, outlining ideas for value engineering and innovations. The client accepted more than $36 million of these, including:

- An alternative pretreatment technology that replaced cartridge and sand filters with auto-strainers to capture solids through a series of stacked screens. The change saved the client capital and maintenance costs.
- A design change to construct the new facility without the need to acquire adjacent real estate by eminent domain. The original plan would have displaced some residents, which would have caused significant delays due to COVID. The plan saved the client time and money.

"Kiewit's approach to progressive design build on our project is working very well and has helped us avoid surprises," said Kurt Wells, group manager of LADWP Water Engineering and Technical Services. "Kiewit tailored their dashboards to our needs. Everyone on the project team has access to the information they need to make timely decisions. Kiewit was the right choice for this complicated project."

Kiewit teams also helped these clients with first-of-their-kind regulatory approvals and with identification of existing utilities during the design phase. "Feeding this information into the design produces higher quality, better focused engineering solutions. It enables us to proactively mitigate issues in the office before they impact construction crews," said Searles.

"Ultimately, when we execute these types of projects well, we properly manage the risks inherent to them and increase our likelihood of financial success while simultaneously building a high-functioning, integrated team with our clients. This is a recipe for a flourishing job and lasting client relationships." **K**

1. The Sustainable Water Infrastructure Project (SWIP) included construction of a below-grade, advanced treatment facility to treat a blend of sewer and stormwater at the Santa Monica Civic Center lot shown here. 2. The SWIP team stands in the 1.5 million gallon stormwater capture tank for a photo.

RIO TINTO KENNECOTT CRUSHER RELOCATION | COPPERTON, UTAH

KIEWIT STEPS IN TO HELP CLIENT

It wasn't in their scope of work, but a Kiewit Infrastructure West Co. team working at a Utah copper mine saved the day earlier this year when they stepped in to help repair a crawler transporter moving a 1,600-ton crusher.

Kiewit was responsible for the heavy civil scope of work on the Rio Tinto Kennecott Crusher Relocation (RTKC) project, which included preparation and maintenance of the main haul road for relocation of the crusher at the copper mine.

Kiewit's work, which began in March 2020, set the stage for the main event: the operation to move the crusher from its old foundation to its new foundation in a location four miles away. This operation was time-sensitive because the move would cause the main haul road to be closed for ore truck traffic, effectively shutting down the entire copper mine during transport.

"Kiewit was scheduled to complete its civil scope for the new crushing and conveying system in 18 months," said Chris Miske, area manager. "But everything we did came down to the 48-hour time period this past April when the crusher was moved."

The client, Rio Tinto Kennecott Utah Copper Corp., had hired a specialized transport subcontractor to move the crusher. During the move, the unthinkable happened — the crawler transporter had mechanical issues and stopped moving in the middle of the haul road. It was a catastrophic mechanical failure, and the client called Kiewit for help.

Kiewit's maintenance team was quick to arrive, and the mechanics worked around-the-clock to perform a major repair on the crawler transporter. They understood the importance of getting the crusher moving again and reopening the copper mine for the client as soon as possible.

"Without Kiewit, it would have been hours or even days of delay to get different mechanics to the site," Miske said. "When you're dealing with such a short time frame, that's big."

This repair assistance is a good example of helping the client solve a problem that could likely have cost them several days and millions of dollars in mining production if Kiewit had not responded.

Kiewit's ultimate success on the project was the result of solid client relationships developed over more than a year by Project Sponsor Joe Cook, Project Manager Jaron Withers and Project Engineer Jake Herron.

"Due to those relationships and Kiewit's performance during the crusher move, the client viewed Kiewit as the go-to contractor who was trusted to ensure successful completion of the overall project," Miske said. **K**

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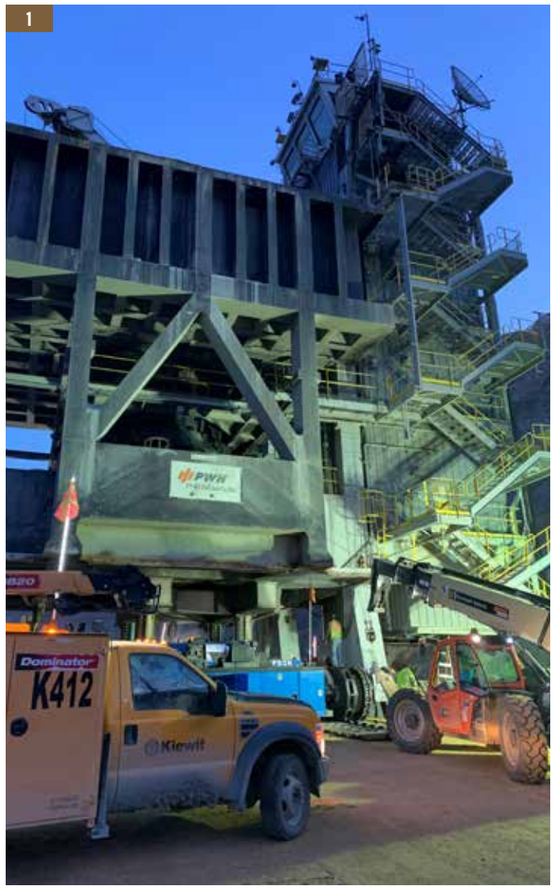


2

1. The Kiewit maintenance team was quick to arrive at the site of the breakdown and perform a major repair to the crawler. 2. Kiewit's scope of work included 2 million cubic yards of excavation and embankment to create new crushed ore conveyor corridors.

LITTLE LONG DAM | KAPUSKASING, ONTARIO

ALTERNATE SOLUTION SAVES TIME AND MONEY

The Little Long Dam Safety project is setting the stage for the next decade of hydro-electric infrastructure development in Canada, and Peter Kiewit Sons ULC is leading the project as both engineer and contractor.

Located approximately 70 kilometers (43 miles) northeast of Kapuskasing, Ontario, Little Long Dam serves as a crucial passageway, managing the flow of water until it reaches the Arctic Ocean. The client, Ontario Power Generation (OPG), undertook the project to meet new regulatory requirements established by the Province of Ontario and to protect its four major hydro-electric generating stations in the event of large-scale flooding in the area.

This part of northeast Ontario experiences massive amounts of water flowing through the Mattagami River in April and July due to freshet (a thaw resulting from melting snow or ice).

Upon completion, the Little Long Main Dam will have the capacity to discharge total flow of 8,680 cubic meters of water per second or three times the amount of Niagara Falls.

This project will significantly improve safety — public safety, environmental safety and the safety of OPG's critical hydro-electric assets.

"If the integrity of the dam became compromised, it could pose a risk to the local communities," said Kiewit Project Manager Simon Gagne.

1

ENGINEERING SOLUTION

To take preventive action, OPG set out to rehab existing infrastructure and increase discharge capacity from Adams Creek to a bypass channel that would protect its four Lower Mattagami River hydro-electric stations — Little Long, Smoky Falls, Harmon and Kipling. To achieve this, the original plan was to expand capacity by constructing a separate new four-gate spillway adjacent to the existing eight-gate spillway, thereby increasing the spill capacity by 50%. However, when Kiewit became involved, they proposed an alternate solution: integrate construction of the four additional gates into the existing spillway structure, which was deemed to be more efficient, and of lower risk than constructing a new stand-alone structure.

"Kiewit's proposal and engineering efforts optimized the construction arrangement, shortened the project schedule, and minimized the project cost," said Pranav Jindal, OPG senior manager for northeast major projects.

Building four additional gates in the existing Adam Creek sluiceway structure simplified the work in many ways. With the new concept, Kiewit was able to keep the spillway in full operation during most of the construction, as well as reduce the footprint of construction operations. Using the existing structure also minimized disturbances to the dyke core.

"OPG ultimately decided to go with this approach because it demonstrated the best value," Jindal said.

The project will sequentially put gates in service from January 2022 to September 2023 and is planned to be completed by September 2023.

2

3

1. On-site work was paused in April 2020 as a result of COVID-19, but work restarted in June 2020 with industry-leading safe-work procedures, including site access restrictions, additional hygiene protocols, social distancing measures, daily screening and more. 2. Rock excavation took place in the downstream channel with the excavated material being re-purposed as fill material for the project. 3. This aerial view shows the barge landing used to load equipment.

COMMUNITY IMPACT

The Little Long Dam Safety project has provided significant opportunities to local First Nation communities to engage on the project. This included input on environmental related activities, as well as new employment and business contract opportunities.

The estimate of contracts awarded to Indigenous businesses is about $42 million. Additionally, 57 Indigenous community members are employed on the project, making a positive impact on the community.

"Kiewit maintains a solid reputation as being a contractor that partners with and works to train Indigenous employees. We're very proud of that," said Gagne.

The COVID-19 pandemic has presented an added challenge on the project, considering that this is a camp job where all workers live in the same space. The project team has been very proactive in implementing safety measures to mitigate any potential spread of COVID-19.

These protocols have ensured that this essential project could continue operations and stay on schedule while working around the natural weather cycle of the region.

LOOKING AHEAD

With the increasing amount of aging hydro-infrastructure across North America, projects like Little Long Dam appear to be an indicator of what's to come in the future. Rehabilitating hydro-structures and upgrading existing capabilities will spur a renewable energy transition.

Kiewit's work on Little Long Dam illustrates how these complex projects require not only the manpower to construct, but also the brainpower to propose engineering innovations that propel projects forward, ultimately ensuring that they enable efficient energy delivery when it's needed most.

A key factor that makes these solutions and project execution possible is a collaborative relationship between owner and contractor. "OPG continues to have a very healthy and open relationship with Kiewit throughout this project. We see us as #ONETEAM striving for a common goal," says Jindal.

And according to Gagne, in the end, "a successful flagship project like Little Long Dam Safety will definitely help demonstrate to the industry what Kiewit is capable of." **K**

TŁĮCHǪ | NORTHWEST TERRITORIES, CANADA

An all-season road connecting the Whati community in Northwest Territories, Canada, to essential services in Yellowknife had been a dream of Tłı̨chǫ citizens for many years. Peter Kiewit Sons ULC was in the process of making that dream come true when the team learned of another essential service that was lacking — internet connectivity.

Kiewit approached the Tłı̨chǫ Government with a solution that would escalate the timeline and reduce the cost of bringing digital services to Whati. They proposed laying the fiber optic conduit along the Tłı̨chǫ All Season Road as the road was constructed, and helped them get financing and accelerate the design process.

Through a partnership with Tłı̨chǫ Environmental and Engineering Services, Kiewit is installing the conduit along the 97-kilometer gravel road and the 13 kilometers from the road into the Whati community. Danny Doig and Shirley Lafferty (right) stand in front of the plowing equipment. The project is targeted for completion in 2022. **K**

WASTEWATER TREATMENT PLANT | PORTLAND, OREGON

The City of Portland Bureau of Environmental Services needed to add secondary clarifier capacity as part of an expansion to the Columbia Boulevard Wastewater Treatment Plant. The job required demolition of existing structures, relocating existing utilities, construction of a Support of Excavation (SOE), and mitigation of lateral spreading concerns in the event of an earthquake.

Kiewit, the City of Portland, Stantec and Jacobs Engineering collaborated very early in the project to select, estimate and design specialty construction techniques to minimize costs and project duration and maximize efficiency.

The project team used Kiewit Engineering Group Inc. to design the SOE compression ring with reinforced interlocking secant piles. Kiewit's SOE design worked with Jacobs' seismic solution by keying the secants into the underlying Troutdale formation. A series of interconnected ground improvement elements acting as shear keys around, and underneath, the new structures provide additional resiliency. **K**

WMATA 3 | WASHINGTON, D.C.

MANAGING THE UNEXPECTED

What do you do when you find out you have three days to clear out your work area and face the loss of eight days from an already tight project schedule?

If you're Kiewit Infrastructure Co., you gather the team together in a room and start brainstorming a solution to the problem.

It happened on the Addison Road section of a project for the Washington Metropolitan Area Transit Authority (Metro) in Washington, D.C. Kiewit was supposed to have a total of 11 weeks to complete work on the Addison Road platform.

The work was scheduled in two phases — six weeks when the outbound tracks would be closed and five weeks while the inbound tracks were closed.

In Phase 1, Metro notified Kiewit that it would need to do some unexpected track adjustment work within Kiewit's work zone. That meant all the Kiewit equipment would need to be cleared off the closed track to make room for about 30 craft workers and multiple pieces of equipment needed to complete the track adjustments in the Kiewit work zone.

The change came at a time there was still a lot of work to be done and only 10 days left to do it before the schedule had them moving into Phase 2.

"We gathered the team together, remained calm and started brainstorming the same day," said Construction Manager Sean Gayle. "We left that room with a number of solutions that were beneficial to both the client and Kiewit."

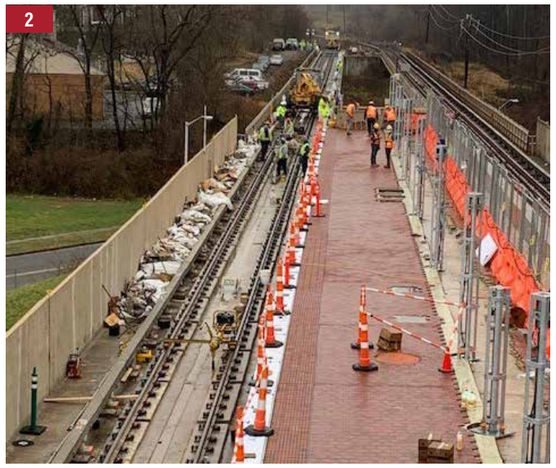
Less than 24 hours later, the Kiewit team, led by Project Director Paul Beljan, Project Manager Brian Watkinson and Gayle, met with the client to outline the impacts of the requested change and to present the proposed solutions to Metro.

The proposed solutions included:

- A revised phasing schedule that would accommodate Metro's work. The track switch would be delayed to the following week to accommodate the change.
- Kiewit would continue to work on track (outside of Metro's work zone).
- Kiewit would provide the client with crane support and testing resources, if needed.

The plan worked. Even though Metro's work took eight days, rather than the planned three days, trains were running on the adjusted rail when the project switched to Phase 2.

"It worked out well for both Kiewit and the client," said Gayle. "Kiewit actually gained an additional week because we added a week to the Phase 1 schedule and were able to continue work on half the track while Metro finished up its work." **K**



1. An inside view of the Addison Road station. 2. Kiewit cleared its work area so Metro could bring in crews and materials (left side) to perform necessary track adjustments. 3. Work on the new platform was completed and the Addison Road station opened on schedule.

KINGSTON THIRD CROSSING | KINGSTON, ONTARIO

INNOVATION IN THE CATARAQUI

In Ontario, Canada, the Cataraqui River forms the lower portion of the Rideau Canal. Completed in 1832, the Rideau is the oldest continuously operated canal system in North America. UNESCO designated it a World Heritage Site in 2007.

For nature lovers, boaters and those who simply crave a beautiful view, the Cataraqui River is a treasured destination. The river, which forms the lower portion of the historic Rideau Canal, draws visitors year-round.

An additional crossing over the Cataraqui, at Kingston, has been on the wish list of citizens and government agencies alike for decades. In 2018, the City of Kingston received funding to build a 1.2-kilometer two-lane bridge.

The city, together with Kiewit and designers Hatch and Systra, formed an Integrated Project Delivery (IPD) team to work on the long-awaited crossing. It's the first time the IPD approach has been used for a bridge project in North America.

Pre-pandemic, the team gathered in a common space dubbed the "Big Room." There, the partners worked shoulder-to-shoulder to plan, design and build the new bridge.

"It was definitely something new, but our team appreciated the ability to be sitting in a room with the designer and the city, and having that direct line rather than a huge chain of emails. I think it allowed for smoother constructability changes," said Alexander Savides, project engineer.

A HYBRID SOLUTION

The IPD model quickly proved to be valuable in areas like construction access and environmental protection. Early in the project, during the validation phase, Kiewit consulted with the team to propose an innovative solution to bring the cost of the project within the city's budget.

"The original concept was to build a trestle from shore to shore, which is about three to four times more expensive than a causeway," said Project Manager Jonathan Panneton.

"We did more studies to understand the water body and discovered that, because of the relatively shallow water level, adding a temporary causeway made sense," he said.

"We came up with a hybrid solution — a 930-meter causeway and a 200-meter trestle — based on the characteristics of the water body, but also with cost in mind. It made a significant difference on the validation."

Connections the city had already developed with regulatory agencies and other stakeholders that needed to weigh in — including Parks Canada, the Ontario Ministry of the Environment, Conservation and Parks, Transport Canada and the Department of Fisheries and Oceans — were game changing.

"Absolutely, that was the key," Panneton said. "With the city's previous relationships and their experience to that point, it was only really together that we were able to get that approved and move forward."

THE MAKE-OR-BREAK MOMENT

Mark Van Buren, deputy commissioner, Major Projects Office for the City of Kingston, describes that change in the specifications as a turning point for the project.

"As the owner, we bring a considerable amount of project knowledge, background information and established relationships with various regulatory authorities. With the IPD model we're able to pair these benefits with the knowledge and experience of the designer and constructor," he said.

"It was Kiewit that led some of the early thinking about, 'why approach it this way, what if we approach it that way.' The time and the dollar savings associated with this new approach was huge. It was probably, at the end of the day, the make-or-break for the project."

ANIMAL-FRIENDLY ECO-PASSAGES

Approval of the hybrid causeway and trestle to provide construction access in the river was contingent on satisfying environmental requirements.

1. New Kiewit shareholders and managers in Canada visit the Kingston Third Crossing project. 2. This photo shows the first crossing of a Kiewit LR 1200 SX on the temporary trestle lift span over the Cataraqui River. 3. Driving deep foundation casing with one of Kiewit's HS 895 cranes on the temporary rock causeway.

“It was Kiewit that led some of the early thinking about, ‘why approach it this way, what if we approach it that way.’ The time and the dollar savings associated with this new approach was huge. It was probably, at the end of the day, the make-or-break for the project.”

MARK VAN BUREN
Deputy Commissioner,
Major Projects Office for the City of Kingston

In addition to its designation as a UNESCO World Heritage Site and a National Historic Site of Canada (NHSC), the location is a Canadian Heritage River, a federally regulated navigable waterway and a provincially significant wetland. It’s home to more than 300 fish and wildlife species, including four types of turtles listed under Canada’s Species at Risk Act.

Throughout the project — scheduled for substantial completion in fall 2022 — consideration for the creatures in this habitat has always been top of mind.

To make sure fish and wildlife can navigate the waters without issue, Kiewit created a unique solution: floating turtle fencing. It’s a protection that has evolved over time, said Environmental Coordinator Shem Evans.

“We modified turbidity curtains to have a higher freeboard and we eventually swapped out some of the initial offshore-based ‘floating’ fences for a combination of shore-based exclusion fencing and curtains. Then we bolstered that with an active turtle trapping program and de-fishing efforts for excluding our work areas. The combination of things has sort of adapted into the second year of construction and has become pretty effective.”

Five eco-passages were built into the temporary causeway using an innovative Kiewit Engineering Group design with re-purposed shipping containers that allowed for ongoing movement of aquatic wildlife upstream and downstream of the project site during construction.

“We are collectively monitoring the site and addressing environmental issues,” Evans said. “It’s really refreshing to see that everybody wants to be a part of it, to protect it and to push this bridge through safely — not only for ourselves, but for every little critter that’s out in the river and associated wetlands.” **K**