

the magazine of kiewit corporation

# KIEWAYS



2012 / Quarter 3



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 company operates through a network of offices in the United States, Canada and abroad. Kiewit offers construction and engineering services in a variety of markets including transportation, water/wastewater, heavy civil, power, oil, gas and chemical, building and mining. With 2011 revenues of more than \$10 billion, Kiewit's workforce includes approximately 10,300 salaried and hourly staff along with more than 14,400 craft workers.

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#### KIEWAYS

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#### FLOATING ON TOP

Kiewit was awarded three  
separate contracts associated with  
State Route 520's floating bridge  
replacement for the Washington  
Department of Transportation.  
Story on Page 14.



## EXPERTISE IN THE ENERGY INDUSTRY

In recent years, the amount of work Kiewit performs in the oil, gas and chemical (OGC) and power markets has increased markedly, a trend that will likely continue given the current state of the energy industry. Kiewit Energy Group, formerly known as Kiewit Industrial, brings together our expertise in power and OGC, so we can effectively deliver our services to clients throughout North America and abroad.

Advances in drilling technologies are rapidly changing the landscape in the oil and gas industry. Kiewit's geographic coverage, expertise and ability to construct the needed infrastructure — from offshore drilling platforms to natural gas processing plants to oil sands processing plants — means that we can comprehensively meet our clients' needs.

In power, Kiewit is a leader in combustion turbine installations and air quality control systems (AQCS). Tighter environmental regulations combined with abundant, cheap natural gas are the driving forces behind a new build-out of natural gas-fired capacity in North America. Our experience positions us to play a significant role in this round of new capacity additions.

In this issue of Kieways, you can read more about our power capabilities, including our ability to take on lump sum, turnkey, engineer-procure-construct (EPC) projects. You'll also read about our work on a renewable energy project in the Yukon, the world's longest floating bridge and the world's largest drainage pump station. It's a real source of pride to work on projects like these and to serve such a broad range of clients.

#### BRUCE GREWCOCK

President and CEO



## EXPANDING RENEWABLE ENERGY IN THE HEART OF THE YUKON

Kiewit recently completed one of the largest construction projects to ever take place in the Yukon Territory. Story on Page 10.



## IN THIS ISSUE

### 04 POWER, A FORCE TO BE RECKONED WITH

With a majority of its workload in clean coal technology, gas-fired power generation and transmission and distribution, Kiewit excels in the power market.

### 10 EXPANDING RENEWABLE ENERGY IN THE HEART OF THE YUKON

Kiewit completed Yukon Energy Corporation's Mayo B project, expanding renewable energy in the heart of the Yukon.

### 14 FLOATING ON TOP

Pontoon, anchor, moorage and bridge construction are all part of three separate contracts to replace the world's longest floating bridge outside of Seattle.

### 22 THE BEST LINE OF DEFENSE

It's been one year since Kiewit completed construction of the West Closure Complex. Now, the finished product reduces the risk of flooding for nearly 250,000 people.

## ON THE COVER

Kiewit engineered, procured and constructed the Brayton Point Closed Loop Cooling project for Dominion Energy in Somerset, Mass. The project involved a 1,575-megawatt open cycle to closed cycle cooling conversion. Read more about Kiewit's work in the power industry on Page 4.

# POWER

A FORCE TO BE RECKONED WITH

*Since 2000, Kiewit has built enough new natural gas-fired generation capacity to power 14 million homes, but its success in power dates back much earlier than that. For more than half a century, Kiewit has played an integral role for power clients across North America. In an industry with hundreds of competitors, only a handful match Kiewit's size and experience.*

Kiewit Power stands out for its innovation, quality and attention to detail. The team's work on projects such as the 568-megawatt combined-cycle Los Medanos Energy Center in Pittsburg, Calif., and 660-megawatt Nebraska City Unit 2 coal-fired power plant have been recognized by POWER magazine as top plants. POWER also declared Kiewit-led projects High Desert Power Plant and Iatan Unit 2 as plants of the year in 2009 and 2011, respectively.

Kiewit engineers, procures and constructs in the gas-fired, coal-fired, air quality control systems (AQCS), renewables, nuclear and transmission and distribution markets. However, the majority of its current workload consists of three primary areas:

1. Clean coal technology
2. Gas-fired power generation
3. Transmission and distribution

#### CLEAN COAL TECHNOLOGY

"Our biggest opportunity and most of our backlog is in air quality control systems (AQCS), but that will likely shift to gas-fired power generation," said Dave Flickinger, district manager for Kiewit Power Constructors, one of the company's operations focused on the power market.

AQCS, a form of clean coal technology, is being driven by government and Environmental Protection Agency (EPA) standards to reduce emissions at coal plants. Existing coal plants have to be retrofitted with scrubbers and other pollution control equipment. Plants that are not modified will most likely be replaced with a gas-fired power plant.

"Some clients are finding that it is cheaper to build a gas-fired power plant at the estimated or anticipated price of gas over the next 20 years than it is to clean up an old coal

plant that maybe only has 20 years left in it," Flickinger said.

As part of the LaCygne Generating Station Environmental Retrofit, Kiewit is engineering, procuring and constructing the retrofit of the 1,500-megawatt coal plant.

Work includes the installation of wet scrubbers and new fabric filter baghouses on two units, along with a selective catalytic reduction system, low-NOx (nitrogen oxide) burners and an over-fire air system on Unit 2 of the facility.

More than 2.5 million manhours are expected to accrue throughout the course of the project. When completed in 2015, LaCygne will feature two of the cleanest coal-fired generating stations in the country with sulfur dioxide emissions removal efficiency greater than 98 percent.

#### GAS POWER GENERATION

A market leader in combustion turbine installation, Kiewit's power team has experience in designing, procuring and building all types of gas-fired power generation – from simple cycle peaking plants to large combined-cycle facilities. Additionally, Kiewit has installed more GE aeroderivative combustion turbines than any other contractor.

Last year, Kiewit completed construction on Chouteau Unit 2, a 540-megawatt combined-cycle natural gas plant in Pryor, Okla. The completion of this unit brought Chouteau Power Plant's capacity to more than 1,000 megawatts. Chouteau was recognized nationally for its low emissions and efficient performance. In August, Kiewit received the Associated Builders and Contractors (ABC) South Texas Chapter's Excellence in Construction Award for the Chouteau Power Plant project.



## The perfect contract model

In the power business, engineer-procure-construct (EPC) contract models have become, for many clients, the industry standard – and it's a standard that appears to be tailor-made for Kiewit.

While each of the various Kiewit companies excel independently, when combining the skills, talents and discipline of Kiewit Power Constructors (KPC), Kiewit Power Engineers (KPE), TIC-The Industrial Company (TIC), Ganotec and Kiewit's infrastructure districts, Kiewit thrives in the power market. The best example of this is found in its EPC projects. If a project is bid out as an EPC contract, the client is giving control of the design, procurement and construction of the project to one entity. It is with that responsibility that Kiewit really begins to flourish.

"We have an excellent resume in the markets we pursue," said Michael Ross, KPE district manager. "But we also have this turnkey, lump sum mentality along with an integrated self-perform team that is able to provide the engineering, self-perform construction and manage the risk. Not many of our competitors can offer that. Kiewit is pretty unique in that regard."

With the designer and constructor working cohesively on a project, as is the case for Kiewit's EPC power projects, the constructor can get involved early in the design phase, leading to design plans with a construction focus.

"The ability to bring together an engineering group that works closely in-house with a construction group is definitely a benefit," said Dave Flickinger, KPC district manager. "Our ability to bring KPE in as an integral part of the team is what sets us apart as a power contractor."

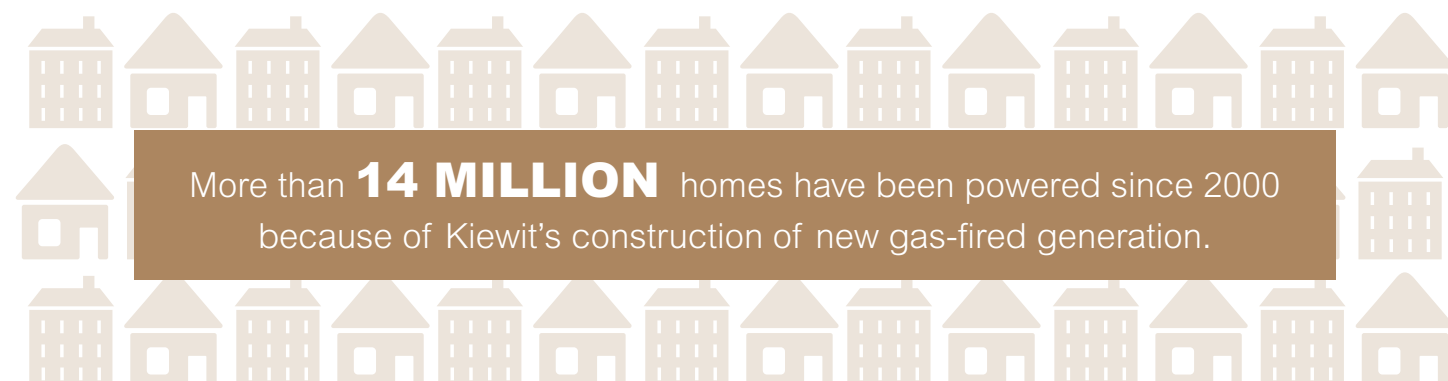
As a lump sum EPC contractor, the design team will begin reviewing the concepts for design with its client and the construction team before any significant design work begins. They will also continually review the 3-D model and samples of drawings with the client and the construction team in advance of a drawing being officially issued for review. This process helps ensure that the design meets the client's expectation, while allowing constructability features to be integrated into the design in a timely fashion.

When clients choose the EPC contract model, they get more than a better price and strong performance. They get the ease of dealing with one overall project manager instead of managing multiple engineers, contractors, vendors and subcontractors.

Ross and Flickinger agree that the most critical time in an EPC project occurs within the first six months of a project. The success or failure of large power projects is often based on the engineering phase, which is why it is crucial that the engineer and contractor work together, Flickinger said. Ensuring that engineering and construction work cohesively is the core of Kiewit's success in the power industry.

"These jobs are won or lost in the engineer's office," Flickinger said. "Construction isn't easy, but it is significantly harder if the design isn't right. What we do together in the first six months will make or break the job."

## Kiewit's power impact





Areas that rely on alternative energy, such as wind farms or solar power, need a solution on windless or cloudy days. In states such as California, simple cycle peaking plants are the solution. Peaking plants are natural gas-fired plants with the ability to start up fast – typically within 10 minutes – and are used when energy use is at its peak or alternative energy solutions are unable to contribute to the grid.


Kiewit is building three plants for different clients across California – Haynes 5 & 6 Repowering project, Marsh Landing Generating Station and Walnut Creek Energy Park. Each plant will have between a 500-600 megawatt capacity when completed.

### TRANSMISSION AND DISTRIBUTION

When it comes to transmission lines, air- or gas-insulated substations or high-voltage direct current systems, Kiewit has the expertise to execute solely as an engineering or construction resource, or in a large engineer-procure-construct (EPC) project, such as Brayton Point.

As part of the Brayton Point Closed Loop Cooling EPC project, Dominion Energy added a power delivery scope to include the EPC of a new substation. The substation included two overhead 138-kilovolt line taps, 138-kilovolt to 4.16-kilovolt station service transformers and switchgear via new underground 138-kilovolt cable. The team's scope also included protection and control modifications to interconnect the new line taps.

On the construction-only Detour Lake project in Cochrane, Ontario, Kiewit overcame weather, schedule and environmental challenges to successfully construct a 230-kilovolt class power transmission line for Detour Gold.

The team's construction window in Northern Ontario was limited to winter work due to the remote access and muskeg soil conditions. The team, consisting of Kiewit, Powertel and First Nations, worked through challenges such as maintaining vegetative buffers and constructing snow bridges to construct the new H-frame, 112-mile-long transmission line. 



1. After Kiewit successfully completed construction of the Iatan Unit 2 project for Kansas City Power & Light, the project was awarded POWER Magazine's highest honor. 2. Crews pay attention to details at Walnut Creek Energy Park, a simple cycle peaking plant scheduled for completion in 2013. 3. Construction is underway at the new 600-megawatt Sutton combined-cycle project. Surrounded by the Cape Fear River and wetlands, the team is carefully planning to preserve the environmentally sensitive location in North Carolina.

# Craft speak out about safety

Kiewit's "Nobody Gets Hurt" safety philosophy is implemented on all power projects. Engraining the philosophy was easy for crews at Walnut Creek Energy Park, one of three simple cycle peaking plants currently under construction in California. Crane Operator Jason Calhoun used to work as a subcontractor. When he worked with Kiewit, he was amazed at the amount of attention paid to safety.

"Working as a sub, I always admired Kiewit's safety ethics," he said. "This is one of the main reasons why I wanted to come on board. Management allows you time to work safely and do it right. As a crane operator, it takes a lot of stress off your shoulders."



"I'm a real stickler when it comes to safety. I've been on projects where my job was threatened for wanting to do things the safe way. But at Kiewit, that's not the case. I was actually backed by safety – a first for me. I was brought up in construction and worked as a tradesman for 20 years, and at Kiewit, safety is not just talked about, it's backed."

**JASON CALHOUN, CRANE OPERATOR**



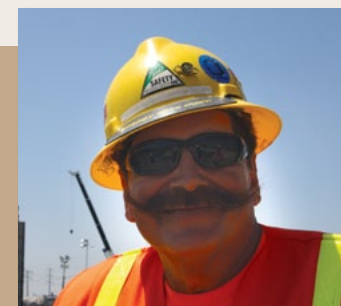
"I take a lot of pride in what I do. I look at it like, 'If it's worth doing, it's worth doing right.' My crew is the same way. It takes a lot of attention to detail to have a safety-first mindset."

**PAUL DAVIS, PIPEFITTER FOREMAN**



"It starts with pride in our union and is backed by paying attention to details and managing people properly. Kiewit is at the forefront of safety. On this site, much like the other Kiewit sites I've been on, they don't just talk safety, they follow through."

**JOE COLLINS, BOILERMAKER GENERAL FOREMAN**



"A key to working safely is to plan your work and work your plan. Do a job hazard analysis (JHA), and pick out all the hazards. Actually talk about it before you even do it."

**RUDY RODRIGUEZ, STEAMFITTER FOREMAN**



# EXPANDING RENEWABLE ENERGY IN THE HEART OF THE YUKON

*In June 2010, the small, remote town of Mayo increased in population by more than a third. Home of the First Nation of Na-Cho Nyak Dun (the Big River People), the century-old village located in Canada's Yukon embarked on one of the largest construction projects ever in the territory.*

## EMPHASIZING HYDROPOWER

Kiewit's Mayo B contract is part of Yukon Energy Corporation's (YEC) 20-Year Resource Plan. The plan aims to reduce the territory's reliance on diesel generation and instead meet energy needs as much as possible through renewable resources, primarily through the development of hydropower sites.

The contract was awarded to Kiewit in March 2010. Three months later, 120 staff and craft set up camp.

"We were really welcomed to the area," said Project Manager Tim Rule. "It was an important project for the community."

As part of the project, a new powerhouse containing two 5-megawatt turbines was built a few kilometers downstream



from an existing 5-megawatt plant. A long tunnel was driven through rock to connect to the existing powerhouse's tunnel. From there, steel pipe penstock, or large diameter pipes, were used to bring water to the new powerhouse.

The expansion increased the dam's energy output from 5-megawatts to approximately 15 megawatts and will offset several million a year in diesel costs.

## OVERCOMING CHALLENGES

Due to the town's remote location, detailed planning was a must. It could take up to three days to get even a box of nails. To get materials, one had to drive five hours to Yukon's capital city, Whitehorse, to pick up a shipment flown in from Vancouver, British Columbia.

"It's a frontier out there essentially, with very few modern conveniences," said Project Engineer Aldo Porra.

The remote location wasn't the only challenge – extreme temperatures presented complications for Rule and his team.

"We always joked that spring is 15 minutes long in Mayo," Rule said.

In the summer, the team experienced temperatures as high as 43 degrees Celsius, or 109.4 degrees Fahrenheit. In the winter, temperatures dipped as low as -48 degrees Celsius, or -54.4 degrees Fahrenheit.

"We had to come up with unique ideas," Rule said. "Our construction window was very short. We had 16 months to go from greenfield to an operating plant."

The team outlined a schedule based on temperature each day. For example, when temperatures fell below -35 degrees Celsius, or -31 degrees Fahrenheit, the team would work for 45 minutes and then break for 15. All work stopped when temperatures reached below -40 degrees Celsius or Fahrenheit.

Rule said it was in part due to the extreme temperatures and the remote location that the group really came together as a team.

"I have never really seen a group of people come together like that. They had a one for all and all for one mentality," he said.

## MAKING A DIFFERENCE

The impact of bringing more than 100 construction workers to the small village was a great concern for everyone. As a result, Rule and his team demonstrated a commitment to the community early in the project, looking for opportunities to become involved wherever possible.

When the mayor of Mayo was looking to buy ultrasound equipment for the local clinic, Kiewit made a donation large enough for the town to purchase the much needed tools and technology.

The town also had a baseball diamond that was in a major state of disrepair, and the team used some of their equipment to make it a useable field.

"It was all fairly easy for us to do. It was the right thing to do," Rule said.

A key interest of First Nation leaders is jobs. Kiewit was committed to hire as many people locally as possible and employed a First Nation liaison to help meet that goal. Two job fairs were conducted, resulting in hiring 25 percent of the workforce from the Mayo region.

Kiewit also emphasized using local firms on the project, with direct subcontracts to First Nation contractors. More than \$1.1 million was spent on local subcontractors and wages to local hires.

## PRODUCTION AND DESIGN INNOVATIONS

Also unique on this project was the installation method. Before the project broke ground, Rule and his team learned of a procedure called weld-after-backfill (WAB), a process, which to Rule's knowledge, had never before been attempted in Canada.

"The idea came from a discussion with the designers," Rule said. "It took a great deal of work to convince them, but in the end, it turned out to show significant savings."

WAB is a technique where two pipes are fitted together. The joint is then wrapped with a heat resistant sealant and the two pipes are backfilled. The joint is then welded after the backfill operation is completed.

"This technique allowed our crews to install pipe as fast as it arrived onsite," Porra said. Previously, they had to wait on welders.

## Mayo B by the Numbers

3 hundred Meter-long drill and blast tunnel

600 thousand Cubic meters of bulk excavation

3.7 thousand Meters of steel pipe penstock

380 thousand Cubic meters of backfill

3.6 thousand Cubic-meter cast-in-place powerhouse containing two 5-megawatt Francis turbines

3.8 thousand Meters of transmission line

1.2 thousand Meters of distribution line

9.5 million Gallons of water used to fill penstock



## Challenges of Mayo B

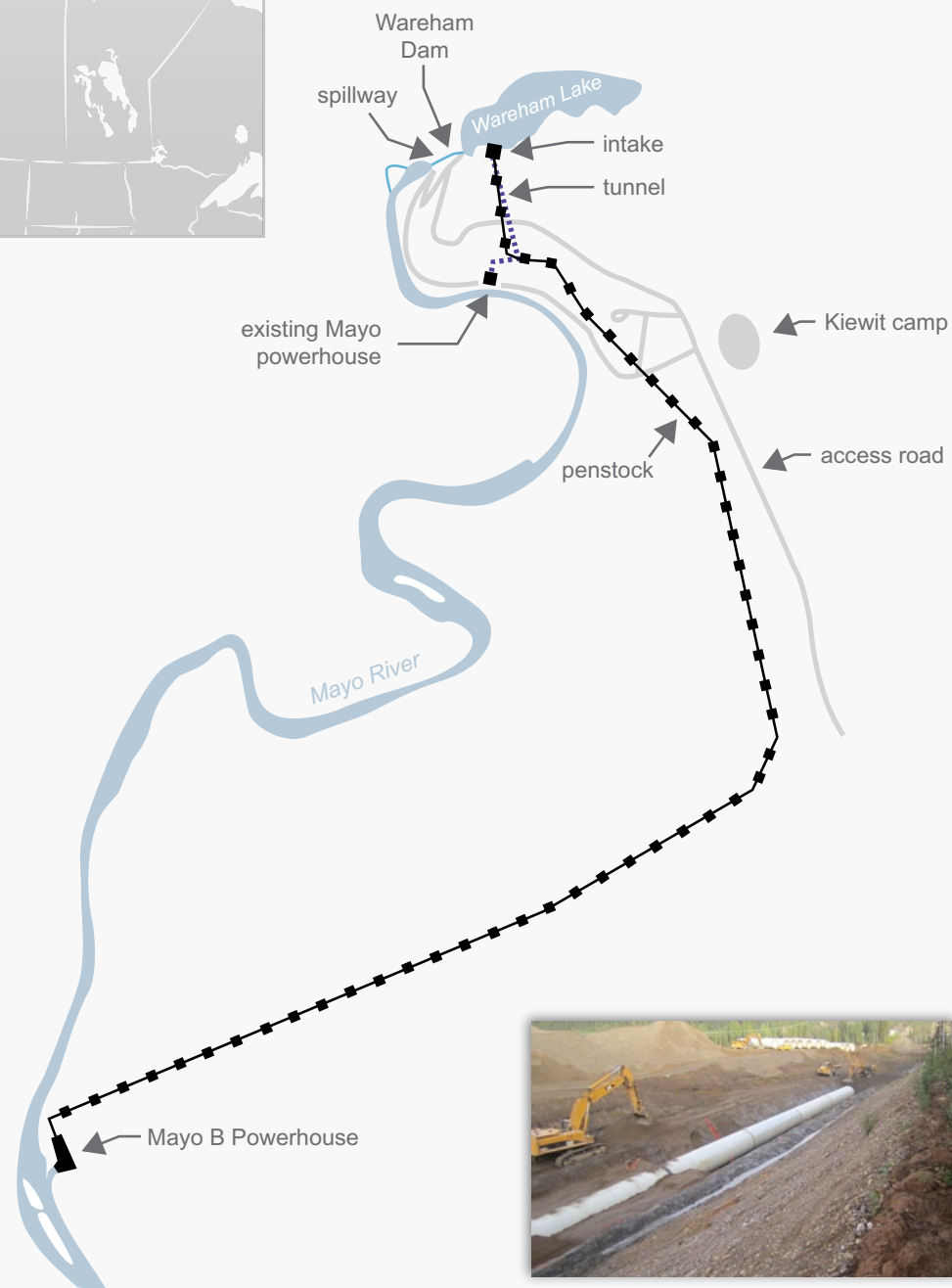
Despite challenges, the project team at Mayo B successfully completed the project, increasing the hydro dam's energy capacity from 5 megawatts to about 15 megawatts, offsetting several million a year in diesel costs.



Turbine installation



Working in extreme conditions



Penstock installation

In the end, listening to and encouraging input from all levels solved a challenge that had the potential to delay the schedule and significantly increase cost. When the project was nearing completion, freezing temperatures posed a challenge to the team, as backfill could not be placed frozen. Expensive options such as tarping and heating and steam bins were discussed with the designers, but in the end a simpler solution was pursued.

"The idea of a big fire came from an equipment operator," Rule said. "It made sense."

With approval from local officials, a fire was lit adjacent to the backfill pile, heating the material to more than 35 degrees Celsius, or 95 degrees Fahrenheit. The heated fill allowed the team to backfill the final stretch of penstock pipe in temperatures as low as -20 degrees Celsius, or -4 degrees Fahrenheit, an operation critical to plant commissioning.

### EXCEEDING EXPECTATIONS

The project was handed over to the client at the end of December, ahead of schedule and under budget.


Final completion occurred in June.

"Kiewit's proven to me at least that even a small company like us can work with them and the quality of work has been, as far as I'm concerned, just top notch," said David Morrison, president and CEO of YEC on CBC/Radio Canada.

Kiewit was chosen based on experience and a reputation for quality, not just price.

"In the end we will be under budget because we chose quality in the beginning," said Morrison.

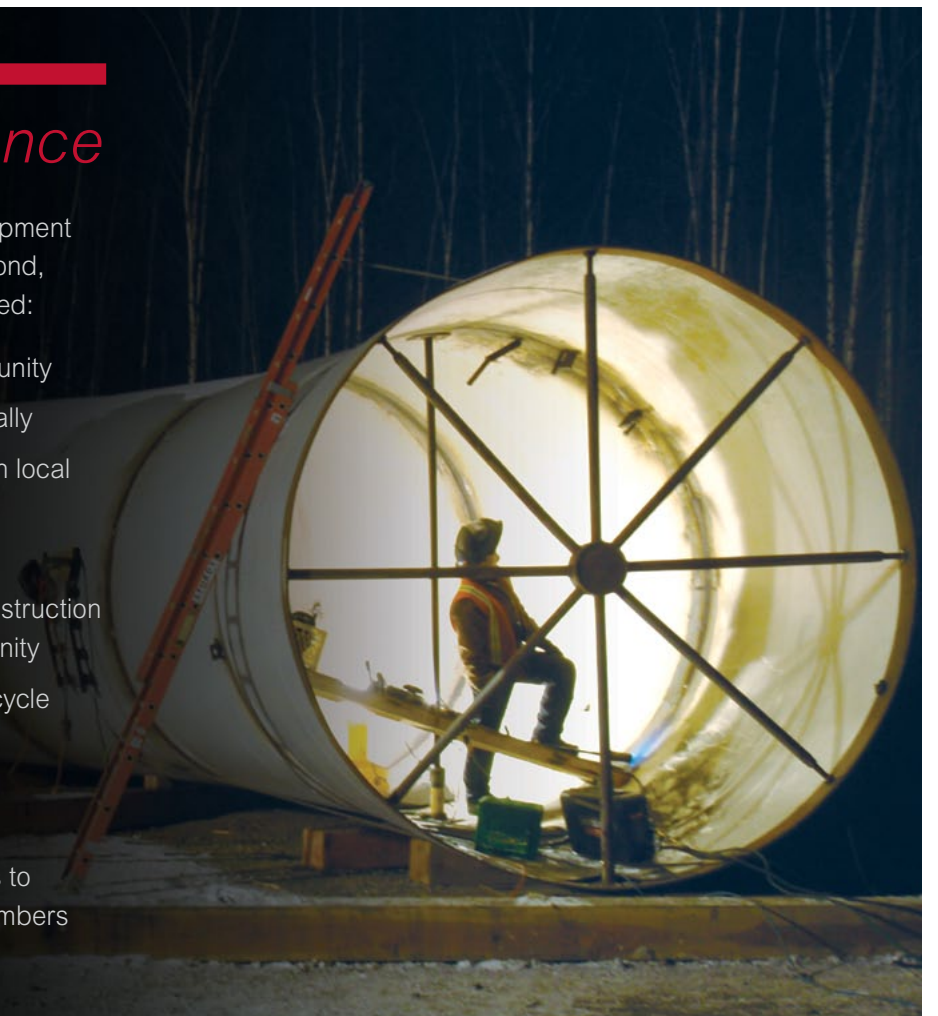
"This is a legacy project for the Yukon and the quality of the workmanship, and the respectful way in which the project was managed will set a high standard for projects in the future," Morrison wrote in a 2011 memo.

"One thing I'll remember on this project forever is the attitude fostered on site," Rule said. "Regardless of what your trade was, everyone clearly understood the underlying goal." 

## Making a Difference

In addition to donating ultrasound equipment and improving the local baseball diamond, Kiewit's other community efforts included:

- Two job fairs held within the community
- Hiring 25 percent of workforce locally
- Spending more than \$1.1 million on local subcontractors and wages
- Grading the local toboggan hill
- Helping with development and construction of a new store for the local community
- Supplying concrete for the new recycle center foundations
- Donating to the Na-cho Nyak Dun community fund
- Offering employment opportunities to more than 25 local First Nation members







EVERGREEN POINT FLOATING BRIDGE:

# FLOATING ON TOP

Built in 1963, the Evergreen Point Floating Bridge in the Seattle area is the longest floating bridge in the world (7,578 feet). It's the northernmost point to cross Lake Washington, the state's second largest natural lake, without the aid of a ferry. Around 150,000 vehicles traveling Washington State Route 520 cross the aging bridge every day. It's an important part of daily life for many in the area.

That's why the Washington Department of Transportation (WSDOT) chose the joint ventures of Kiewit/General and Kiewit/General/Manson for the construction, towing and assembly of a new SR 520 Floating Bridge, as well as its pontoons and anchors, to replace the nearly 50-year-old deteriorating structure currently in place.

"Building a project like this is a once-in-a-lifetime opportunity for many of us," said Erik Nelson, project manager. "There are only six floating bridges in the world, and we happen to be building the longest. There is a great sense of pride knowing that you are contributing to a project that provides great benefit to the public while at the same time stands alone in its features."

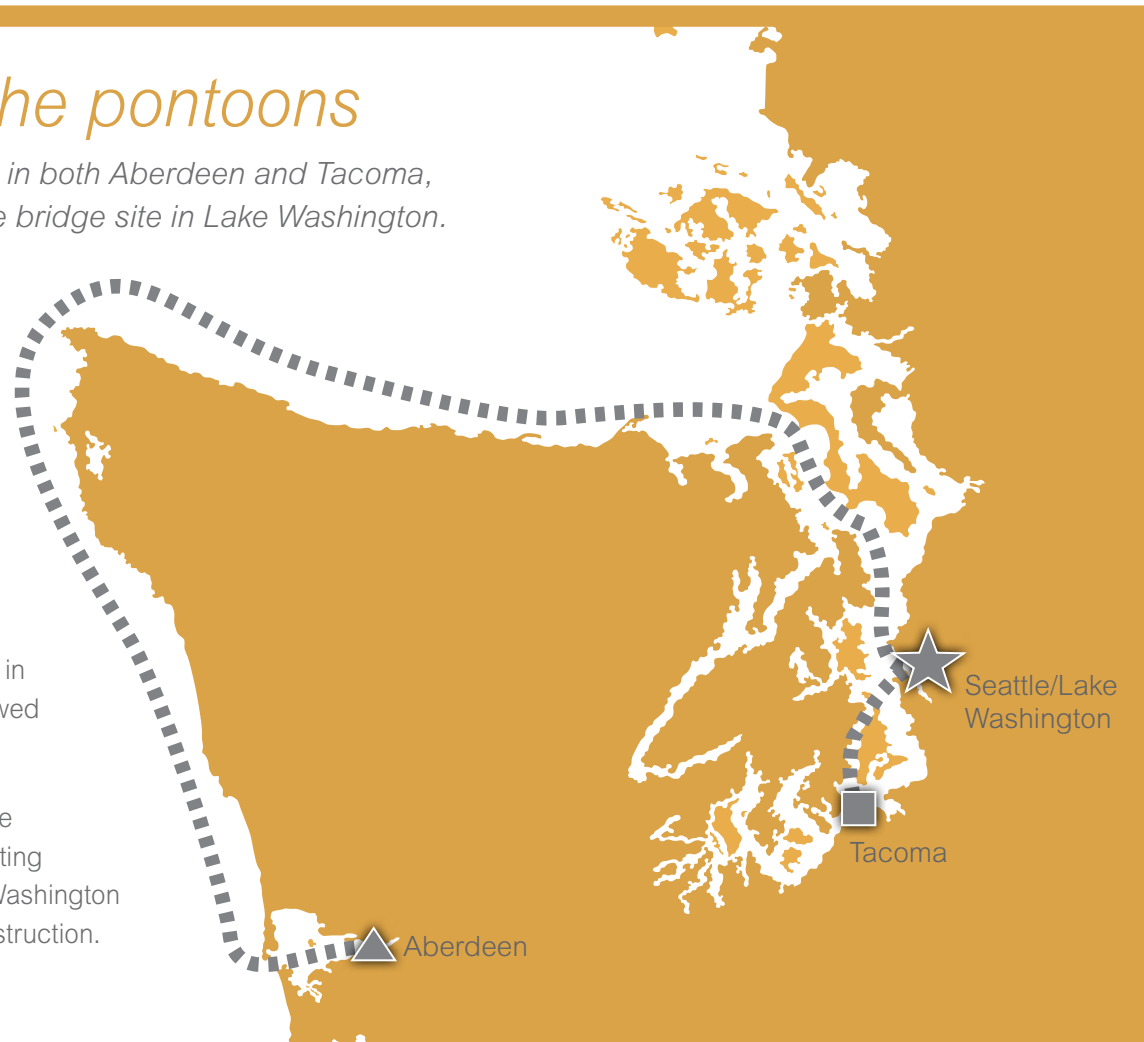
## Plight of the pontoons

Pontoons will be built in both Aberdeen and Tacoma, and then towed to the bridge site in Lake Washington.

▲ 33 pontoons will be constructed and stored in Aberdeen until they are towed more than 250 miles to Lake Washington.

■ 44 pontoons will be constructed at a site in Tacoma and then towed to the bridge site.

★ Pontoons arrive at the Evergreen Point Floating Bridge site in Lake Washington and are used in construction.



The program has three contracts in four different Washington locales.

- One contract focuses on the actual construction of the bridge on Lake Washington, and the building of 44 pontoons in Tacoma. It includes the towing of completed pontoons to the bridge site and the building of anchors and pre-cast deck panels in Kenmore.
- A second contract includes the construction of 33 pontoons in Aberdeen.
- The third contract is for the moorage of pontoons near the harbor in Aberdeen – after completed pontoons are floated out of the basin, they may need to be stored prior to being towed to the bridge site.

The Kiewit/General/Manson team joint venture has the first and third contracts; the Kiewit/General team is executing the second contract.

## MOVING PARTS

The bridge will float on 77 massive pontoons, which will be built at sites in Aberdeen and Tacoma. The main pontoons will be as long as a football field and attached to additional auxiliary pontoons. The pontoons at both construction sites are built in a basin large enough for four to six pontoons at a time, depending on the types of pontoons being built during that cycle.

"You really can't grasp how big everything is until you actually see the pontoons being put together in the casting basin," said Phil Wallace, project manager at the Aberdeen pontoon casting site. "Each pontoon is simply massive. Together, it's going to make for quite the structure."

When all the pontoons are ready to go, the basin is flooded, a gate is opened and the pontoons are floated out into the bay, where a tugboat meets them. Each pontoon is then towed to the bridge site in Lake Washington. For pontoons made in Aberdeen, that means a more than 250-mile tow through the ocean and the Salmon Bay Ship Channel. Altogether, it will take four or five days.

The pontoons will be held in place by anchors, some of which will weigh as much as 587 tons when sitting on the bottom of the lake. In addition to the construction of those anchors and some pre-cast deck panels, the Kenmore site will be used as a main storage and float-out location. The Kenmore site was chosen because of its ideal location – it was one of the few available places with water access and adequate backland area.

"Communication is instrumental to the success of this project," said Nelson. "If we don't maintain concise and constant communication between all of the sites and projects, our opportunities for innovation, risk reduction and typical production efficiencies are greatly impacted."

Dan Hart, site manager at the Tacoma pontoon construction site, agreed with Nelson, and noted scheduling as another key.

"Scheduling and communication are the biggest factors on a project like this, with so many different locations and moving parts," said Hart. "A section of the bridge might require a pontoon from Aberdeen, a couple pontoons from Tacoma and a couple anchors from Kenmore. To remain efficient everyone's got to stay on schedule."



1. Crews work on a longitudinal pontoon. These pontoons are the largest, weighing 11,000 tons apiece and measuring 360 feet long, 75 feet wide and 29 feet tall. They are the largest pontoons ever built in Washington. 2. A craftsman performs a weld on a longitudinal pontoon. 3. The team at Aberdeen is constructing three types of pontoons: longitudinal, supplemental and cross.



## BRIDGE IMPROVEMENTS

The new floating bridge will offer a slew of upgrades over the current bridge:

- The current floating bridge sits right on top of the pontoons, about 13 feet above the water. On windy or stormy days, waves crash over the edge and spill onto the roadway. The new bridge will sit on a superstructure built on top of the pontoons, raising the bridge 20 feet above the water and out of wave-range.
- The new bridge will have three wide lanes in each direction — two general-purpose lanes and a high-occupancy vehicle lane — and four shoulders and a pedestrian/bicycle path. The current bridge has two narrower lanes in each direction with small shoulders and no pedestrian path.
- The bridge has been designed so that additional pontoons can be added to support the weight of a light rail system.

“Floating bridges are unique in terms of the nuances in their design and the analysis that goes into it,” said John White, SR 520 program manager for WSDOT. “All of the longest floating bridges in the world are in this state, and Kiewit and General have been involved in building a majority of them. If anyone knows floating bridges, it’s Kiewit-General. We’re excited to be working with this KGM team and highly confident this project will be successful.”

## COMMUNICATION IS KEY

Kiewit brought in external partner Manson because of its experience on marine projects in the area. In order to improve the lines of communication, the project team and the client, WSDOT, are co-located in the same Bellevue, Wash., building.

However, communication isn’t limited to the groups in that building. Communication between teams working on the different contracts is crucial. In addition, regularly communicating with key constituents impacted by or involved with the project is key to ensuring consistent support from the public.

“Communication between our different contracts is the easy part,” said Nelson. “There is a very specific protocol and communication plan developed to communicate with all the different stakeholders, including local Native American Tribes.”

In order to respect fishing rights and treaties, the project team works with multiple Native American tribes anytime it needs

“There are only six floating bridges in the world, and we happen to be building the longest. There is a great sense of pride knowing that you are contributing to a project that provides great benefit to the public while at the same time stands alone in its features.”

**ERIK NELSON,**  
PROJECT MANAGER

to move equipment and supplies into the lake. There are 150-year-old fishing rights treaties that the state and Kiewit need to honor as they transport and assemble the bridge segments.

“Coordination with everyone involved is key,” Nelson continued. “Whenever we want to bring in any of our marine transportation vessels, we schedule and coordinate with a lot of different stakeholders.”


Simply by virtue of being one of the most high-profile projects in the state of Washington, scrutiny is constant, which is why scheduling is so important.

“We have a very aggressive schedule with a December 2014 completion date,” said Frank Young, project construction manager. “Getting all the puzzle pieces to fit together is the hardest part. Communication is so important, especially through the first quarter of the

project when things are still being fine-tuned — designs can change and plans can change. With so many people involved, bringing everyone together and forming one cohesive team is pivotal.”

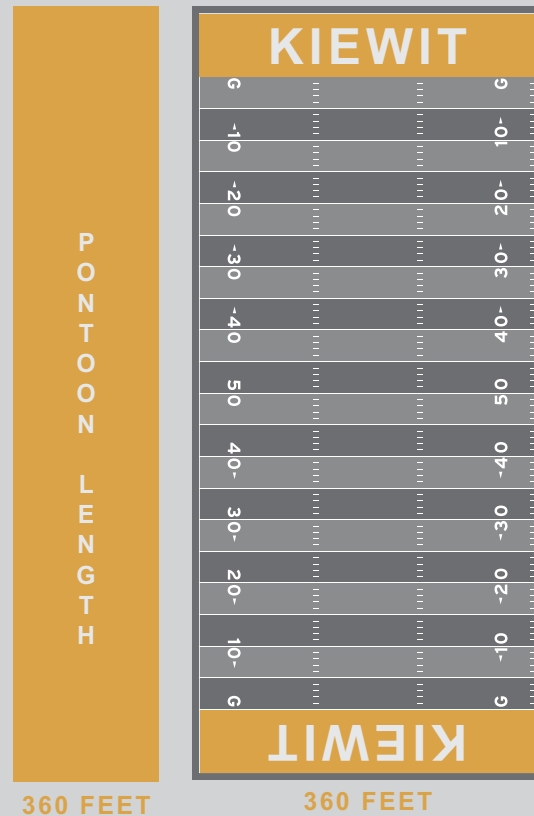
With Kiewit, though, the client has little doubt about the success of the project.

“There are so many challenges that this team has managed,” said White. “It really has to be a precisely planned approach with back-pocket contingency plans. With what we’ve seen from the KGM team, it’s very good at mapping out the preferred approach as well as some of those contingencies.

“We have every confidence in the team here and its ability to deliver.” 

## Just how large is a longitudinal pontoon?

Each longitudinal pontoon, which will be used to support the bridge deck, weighs 11,000 tons and is 360 feet long — the same length of a football field.





BEST LINE OF DEFENSE

# WEST CLOSURE COMPLEX

ONE YEAR LATER

*At first glance, the twelfth tropical depression of the 2005 Atlantic storm season seemed like just another weather event. Five days later, it had transformed into one of the strongest hurricanes ever to make landfall in the United States — leaving in its wake a path of destruction from Florida to Louisiana.*

Hurricane Katrina devastated much of New Orleans, covering 80 percent of the city under floodwater. Heavy winds, rain and the resulting storm surge left some areas in up to 20 feet of water. It would make history as one of the deadliest storms in the United States.

In the seven years since Katrina, the city has undergone another transformation — this time a positive one. Last year, the U.S. Army Corps of Engineers (USACE) New Orleans District met an important deadline: completing the key features of a new 133-mile, five-parish Hurricane and Storm Damage Risk Reduction System (HSDRRS) by the first day of the 2011 hurricane season.

A major element of the \$14 billion HSDRRS is the Gulf Intracoastal Waterway (GIWW) West Closure Complex (WCC). The new structure, built at the confluence of the Harvey and Algiers canals, contains the largest navigable floodgate in the United States and the largest drainage pump station in the world. It was designed to defend against the risk of a storm surge that has a one percent chance of occurring any given year.

#### **THE PROJECT OF A LIFETIME**

For the USACE, the \$1 billion project is one of the largest civil works project in its history.

“Our client needed quick delivery of the project, so the USACE instituted a unique procurement model called early contractor involvement,” said John Proskovec, Kiewit project director. “Using this model, we worked with the engineer team to complete design while simultaneously moving construction ahead on a cost-reimbursable basis. If the project had used a traditional design/bid/build process, the team likely would not have reached its cost and schedule milestones.”

With tensions running high among New Orleans residents after Katrina, meeting the goal of having measures in place to defend against a 100-year storm surge by June 2011 was only part of the challenge. One of the biggest hurdles was to gain the trust of the local population.

“Stakeholder engagement was huge on this project,” said USACE Project Manager Tim Connell. “Not everyone had the same views or concerns, but Katrina had an effect on the way people were looking at things. As we moved the project forward, we saw people get on board with the



West Closure Complex reduces risk of flooding for

**245,000  
PEOPLE**

living on the West Bank of the Mississippi River.



benefits of the project and embrace the system as a good solution to the problem.”

That included working closely with the Environmental Protection Agency (EPA). The WCC site was located on the eastern edge of the Bayou aux Carpes — a designated Clean Water Act 404(c) area and nationally significant wetland. After many public hearings and conversations with the EPA, the USACE was able to negotiate a modification of the area resulting in the least detrimental impact.

**SAFE FOR VESSELS**

Today, the WCC is nearly 95 percent complete. Connell measures the success of the project as much by what didn't happen. No one — business or resident — was displaced because of the location of the structure. And, while construction required intermittent delays, traffic on the waterway remained open for barge traffic.

About 30 commercial barges travel through the site every day. The design of the gate structure has done much to mitigate the risk of vessel impacts by giving 600- to 1,000-foot barge tows enough clearance to move through the WCC safely and smoothly.

1. Sector gate walls and the pump station are being fabricated while engines are being placed on the pump station.
2. Crews work to set the needle girder storage deck. The needle girder is used for maintenance and can dewater the entire structure or individual gate bays.



Those who use and manage the waterway are pleased with the outcome, Connell said.

“Feedback has been tremendously positive about the way we handled the navigation component. The Gulf Intracoastal Canal Association as well as the Harvey Canal Industrial Association are particularly happy with what we've built. We realize there's some concern about how the structure will operate when it will need to close in a storm event. But we're working through that.”

**FINISHING TOUCHES**

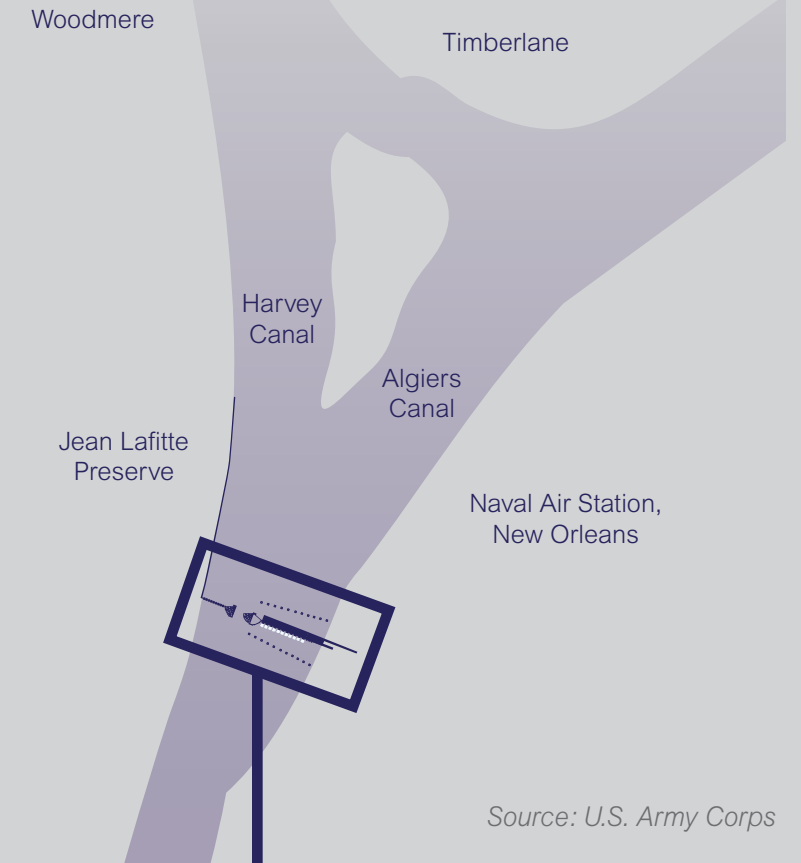
Only a few tasks remain before the WCC will officially be complete. Cleaning up the site and demobilizing will be the last steps in finalizing the project. As the work fast approaches an end, Connell says the last day on site will be bittersweet.

“This has been a once-in-a-lifetime experience for every person involved. Working on something like this with so many achievements — the first, the largest, the fastest — it's been nice to be a part of it.”

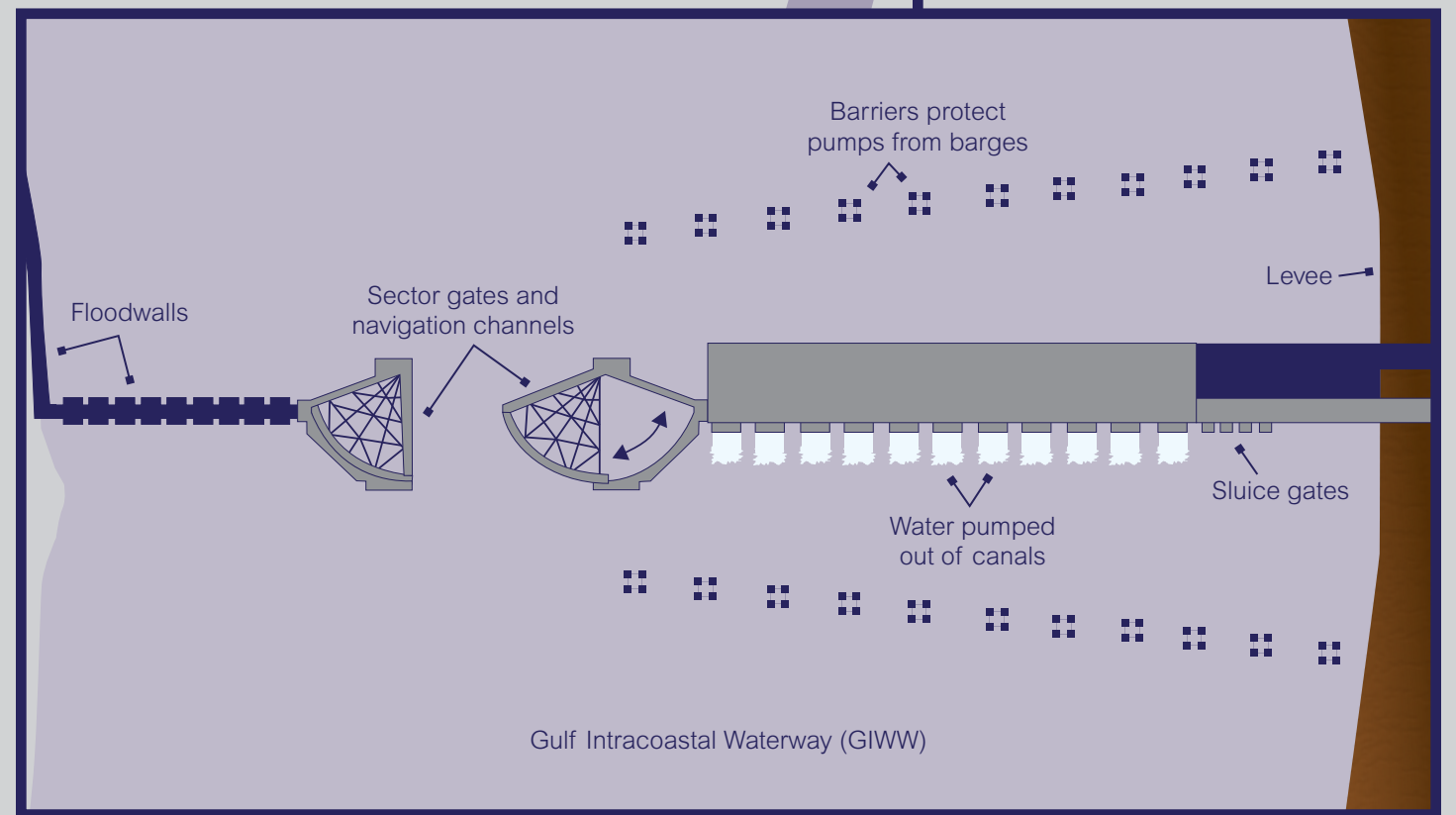


# Reducing Risk with West Closure

*West Closure Complex is the largest drainage pump station in the world. Its 11 pumps are able to move 19,140 cubic feet of water per second out of the Harvey and Algiers canals. West Closure's floodwalls and gates are designed to keep storm surge out of the canals during a storm event. In normal weather conditions, the sector gate will remain open, allowing boats to pass through.*

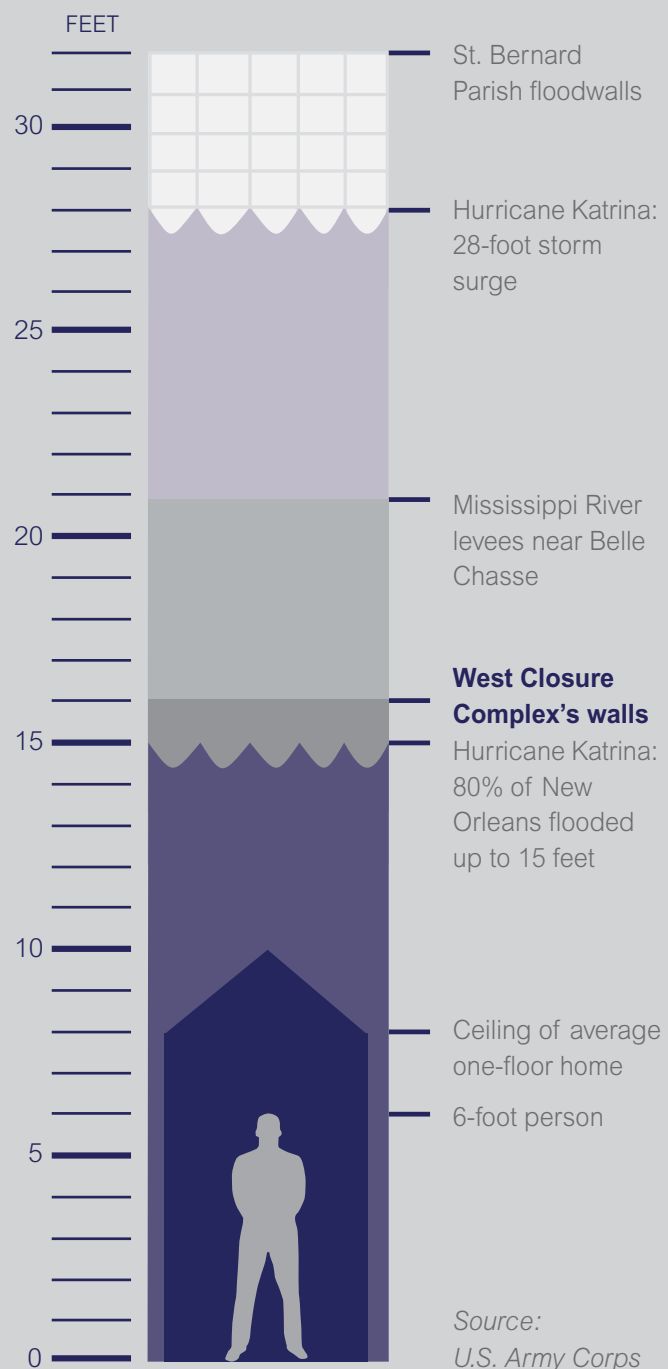


Source: U.S. Army Corps



## Storm damage risk reduction

When Hurricane Katrina struck, most of New Orleans was under 15 feet of water. The construction of West Closure Complex is just one feature of New Orleans' 100-year Hurricane and Storm Damage Risk Reduction System (HSDRRS), which reduces the risk of damage from a storm surge that has a one percent chance of happening in any given year.



The project also made an impression on the Kiewit team, said Proskovec.

"Many of the people who have worked on the project for the USACE live in New Orleans and had damage to their homes during Katrina. Some of them lost everything. Because of this, all the employees associated with the program worked tirelessly to meet the schedule goals. It was especially satisfying to meet the deadline for this project."

### A PROJECT TO BE PROUD OF

The entire project has maintained a focus on partners and teamwork, emphasized Connell. Working on an extremely aggressive schedule to meet the June 2011 deadline appeared nearly impossible when construction started.

"Kiewit and our other partners made a tremendous effort getting to that interim date. Achieving that milestone was a testament to everyone involved."

Although history has shown that Mother Nature is always capable of producing something bigger than expected, Connell said he is proud to see the finished product.

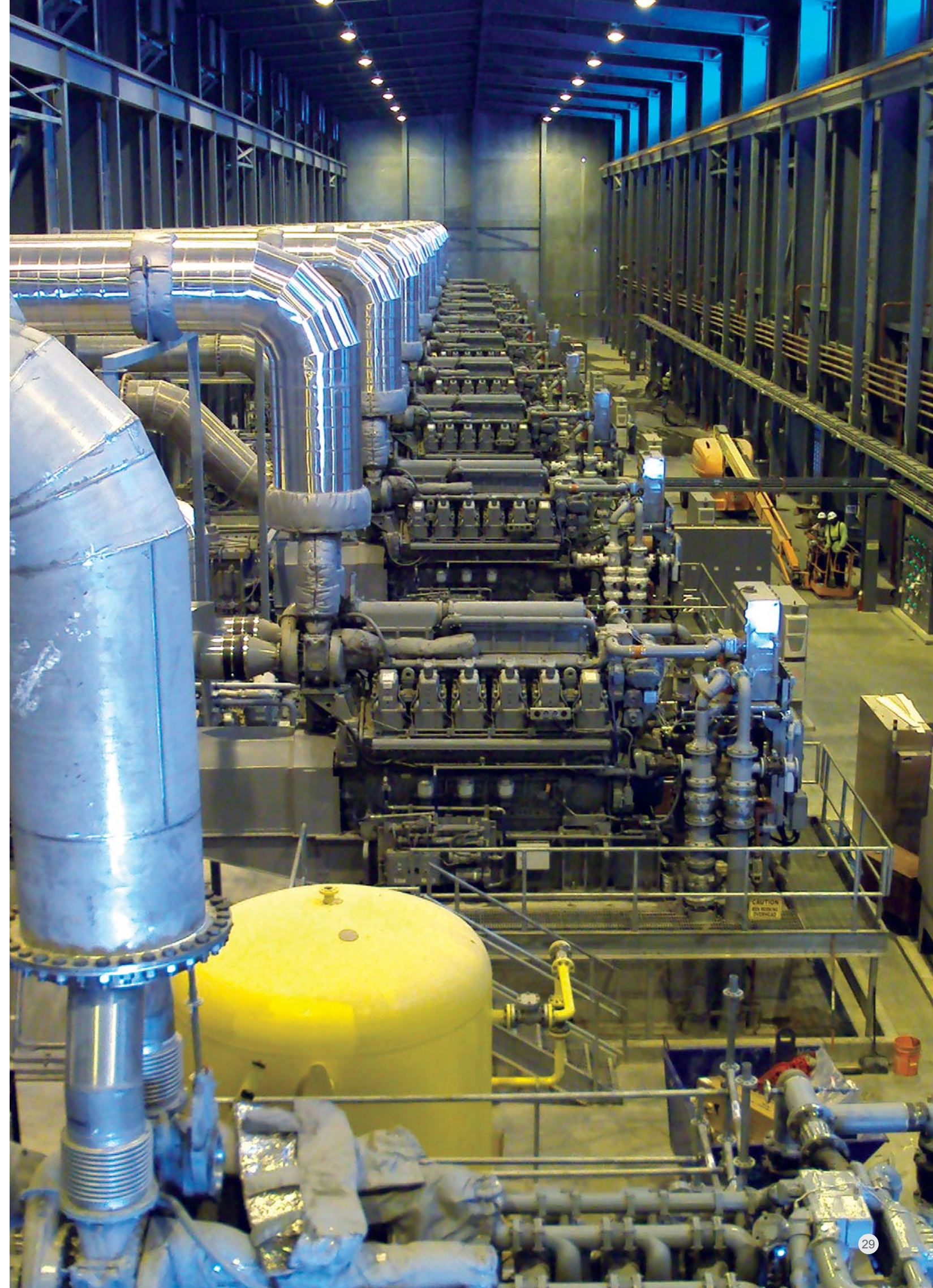
"There is always residual risk in a project like this, but we definitely met the challenge for this 100-year event, and have done it well."

### TESTED BY ISAAC

The West Closure Complex faced its first real test in August as Hurricane Isaac made landfall in Louisiana. While only a Category 1 hurricane, it was a slow moving storm, subjecting Louisiana and surrounding states to extensive periods of heavy rain lasting 24 hours or more.

The West Closure Complex defended the city as it was designed to do, withstanding the wrath of the storm, and the team was right there with it.

"It was a major test," Proskovec said. "We'd never had to close the gates and pump in a live situation before that. But all our practice in the past year left us well prepared. It did what it was designed to do." **K**







# Kiewit

Kiewit Corporation  
3555 Farnam  
Omaha, NE 68131

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