

Kraemer Spans a Century of Success

For more than 100 years, Kraemer North America has emphasized safety and quality while building technically challenging bridges

by Monica Schultes

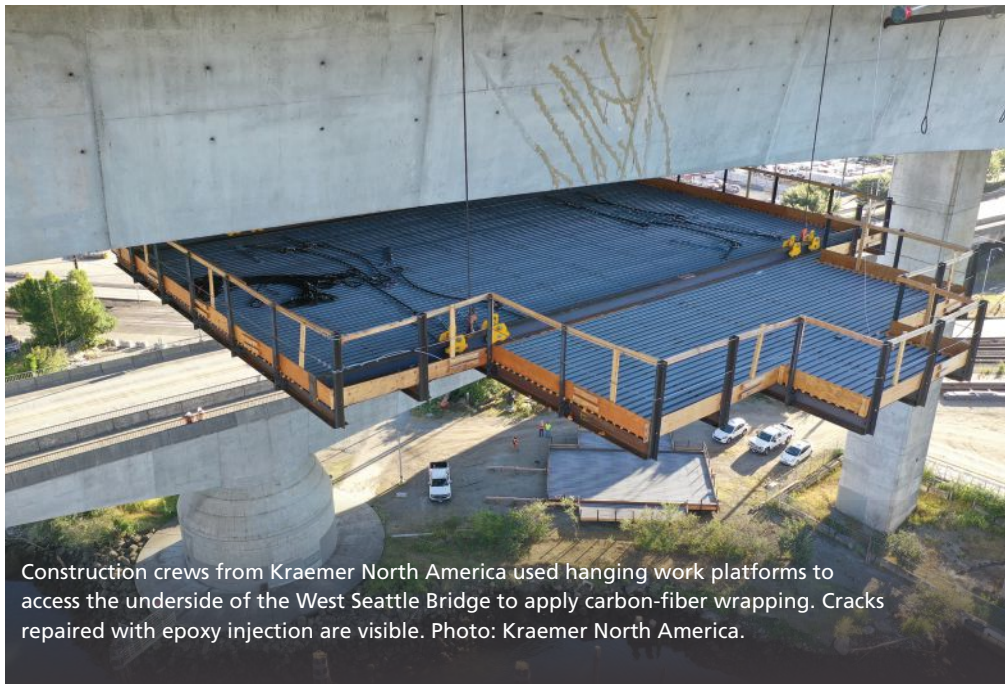
With 112 years of experience in the construction industry, Kraemer North America (KNA) seeks to address owners' challenges while providing opportunities to employees through the company's sustained growth. Projects that require a high level of technical experience, innovative equipment, and in-depth knowledge of the delivery process are of particular interest to the firm.

Like any contractor that has lasted for more than 100 years, KNA has evolved with changing market demands, infrastructure needs, and project funding. Based in Plain, Wis., the company has carefully expanded the business to feature alternative delivery methods, including design-build, construction manager/general contractor (CMGC), and, most recently, progressive design-build (PDB).

Alternative Delivery Methods

On PDB projects, the design and construction teams are selected based on qualifications at the earliest feasible stage of the project. The increasing popularity of PDB can be attributed to contract flexibility and collaboration. KNA targets projects with technical challenges—those that require innovation and integration of engineered solutions and construction methods. The firm tends to seek projects that are beyond the capabilities of others and require collaboration with owners to address project goals and challenges.

Today, KNA maintains a reputation for safety, quality, and capability as a builder of complex structures. "It is a core part of the Kraemer culture to meet challenges



Construction crews from Kraemer North America used hanging work platforms to access the underside of the West Seattle Bridge to apply carbon-fiber wrapping. Cracks repaired with epoxy injection are visible. Photo: Kraemer North America.



Originally constructed in 1923, the Franklin Avenue reinforced concrete arch bridge over the Mississippi River required substantial rehabilitation. Photo: HNTB.



On the Franklin Avenue Bridge project in Minneapolis, Minn., Kraemer North America collaborated with others on the full removal and replacement of the superstructure beams and a complete replacement of the reinforced concrete bridge deck. Photo: HNTB.

together. We see ourselves as part of the owner's team, not their adversary—we are in this together," says Dave Zanetell, president of KNA. "The success of every project is determined by our people and their commitment to a common goal shared with the owner. At KNA, employees have the opportunity to lead through daily planning and dedication to our core values: integrity, ingenuity, safety, and quality to deliver for our clients."

Although KNA has been building bridges since the 1940s, KNA's bridge division was not officially created until 1957. More recently, the firm's attention to the integration of engineering and construction has helped KNA transition to design-build and other alternative

delivery methods. Alternative delivery methods are now approximately half of KNA's business volume. Repeat business is the ultimate validation of their efforts.

Rawson Avenue Bridge

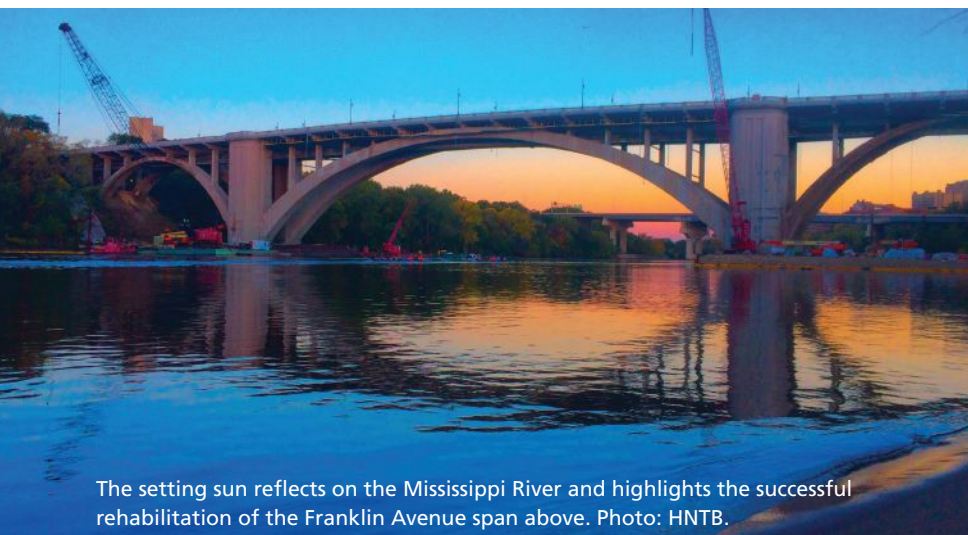
As bridge owners push for faster delivery, construction equipment and technology are helping to make those aspirations a reality. In 2013, KNA used self-propelled modular transporters (SPMTs) during the Rawson Avenue and Interstate 94 (I-94) Bridge replacement near Milwaukee, Wis. Working closely with the Wisconsin Department of Transportation, they demonstrated that accelerated bridge construction (ABC) methods can produce safer projects with less disruption to the traveling

public. The new prestressed concrete girder bridge was constructed in two sections along the side of I-94, and both spans were rolled into place within a 12-hour window.

Collaborative Mindset

The scale and complexity of today's bridge projects make collaboration a necessity for a successful outcome. KNA prefers a team-oriented culture and collaborative style to integrate design, temporary works, and execution. For contractors such as KNA, being involved early in the design process is critical to planning project activities while minimizing risks to both owners and the project team. Planning and collaboration are not just valuable to the contractor, but the designer and owner as well. "Boots-on-the-ground input can provide real context to the constructability challenges that may otherwise be overlooked in a bid-build delivery," explains Zanetell.

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The setting sun reflects on the Mississippi River and highlights the successful rehabilitation of the Franklin Avenue span above. Photo: HNTB.



The new cast-in-place concrete through-arch Park Road Bridge in Iowa City is built to withstand extreme flooding along the Iowa River. Photo: Kraemer North America.

Interstate 280 over the Mississippi River

Feedback from the frontline was vital when meeting with stakeholders to discuss the deck replacement project of Interstate 280 (I-280) between Davenport, Iowa, and Rock Island, Ill. KNA was awarded the bid to remove and replace just under 1 mile of reinforced concrete deck across four lanes on I-280 over the Mississippi River. The deck of the existing bridge, which was built in 1972, was a 9.5-in.-thick reinforced concrete slab on corrugated stay-in-place metal deck forms with a 2-in.-thick concrete overlay. The new 8.5-in.-thick reinforced concrete deck was constructed with traditional wood forms that were removed after construction, allowing for future visual inspections of the underside of the deck.

The deck was replaced in two stages, with the first stage for the westbound

lanes constructed between March and October 2021. During the winter shutdown after that stage, KNA collaborated with the Illinois and Iowa Departments of Transportation to revise demolition and access plans for the second stage of construction based on the successes and challenges encountered in the first stage. KNA revised the demolition plan to use hydrodemolition and a linear procedure to ensure that the superstructure was not adversely affected by construction-loading conditions. KNA was then able to preorder materials before the second stage to avoid rework and supply-chain delays. The deck on the eastbound lanes was replaced between March and October 2022.

West Seattle Bridge

When cracks were observed to be growing at an accelerated rate on the West Seattle Bridge across the Duwamish

The striking through-arch design of the Park Road Bridge includes a 10-ft-wide multiuse path, seen here from below. Photo: Kraemer North America.



River in Washington state, the structure was closed to traffic for emergency stabilization efforts. KNA's collaborative mindset was once again a project asset. "With 100,000 commuters impacted, the pressure was on to move quickly," recalls Adam Dour, project manager with KNA. The initial repairs occurred

History of Edward Kraemer & Sons

The history of Edward Kraemer & Sons began in 1911 when Kraemer built a house for a friend and established Edward Kraemer & Sons in Plain, Wis. In its early days, the company constructed new homes, barns, and cheese factories. After automobiles became the primary means of transportation in the United States, the Kraemer firm began building short-span concrete bridges in the 1930s and 1940s, and it left commercial building construction altogether in the 1950s.

For decades, Kraemer has found success building roads, bridges, and municipal infrastructure, with technically challenging structures emerging as a core part of the company. Adapting to market demands and infrastructure budgets fueled many of its growth cycles. Alongside the transportation division are rail and marine divisions. The firm currently delivers projects in 14 states, with area offices in Wisconsin, Minnesota, Colorado, and, most recently in Seattle, Wash. Their current work spans from Michigan to Seattle and Minnesota to Texas.

In 2014, Obayashi, a Japan-based global construction firm, invested in a part of Edward Kraemer & Sons. The company transitioned to the name Kraemer North America (KNA), while maintaining its existing leadership and ownership. The partnership with Obayashi has changed very little from an operational standpoint. "Obayashi's technical resources and bonding capacity allow KNA to take on an extra level of complexity and volume, which may have otherwise been a hurdle," explains KNA president Dave Zanetell. "Our approach to projects and our relationships with agencies and owners has been the same throughout. We see this as a mutually beneficial relationship that has provided our team with added depth and technical strength."



Aerial view of the Rawson Avenue Bridge replacement site before the two precast, prestressed concrete girder bridge spans (far right) are moved into position. Photo: Kraemer North America.

during the early days of the COVID-19 pandemic, and supply chains were fraught with uncertainty.

The work on the West Seattle Bridge involved a two-pronged approach. During the emergency repairs and stabilization of the bridge, the Seattle Department of Transportation (SDOT) evaluated the solutions presented by the project team and opted to rehabilitate the bridge instead of replacing it. KNA contributed ideas and solutions for constructability that helped guide the SDOT decision-making process. Because federal funds were involved, a formalized contracting process was required, and a separate CMGC contract for a second phase was awarded to KNA.

Dour describes some of the challenges the team faced on the jobsite. "It was

Using self-propelled modular transporters, Kraemer North America moved two precast, prestressed concrete bridge spans into place in 12 hours on the Rawson Avenue Bridge replacement project. Photo: Kraemer North America.

delicate work to get the new external post-tensioning [PT] anchorages into place. For the new PT, we had to core through 17-ft-thick concrete diaphragms to hit our exit points within tight tolerances—all while in proximity to existing PT ducts. That blind approach was challenging." In addition, KNA had to alleviate a stuck bearing on pier 18 to allow for proper movement in that location. They shifted workforce resources locally to better serve the project and borrowed some personnel from around the company to complete the work.

KNA worked with SDOT and design engineer WSP during the extensive outreach program. "This project is going to raise awareness among other agencies that may have similar structures. The West Seattle Bridge will

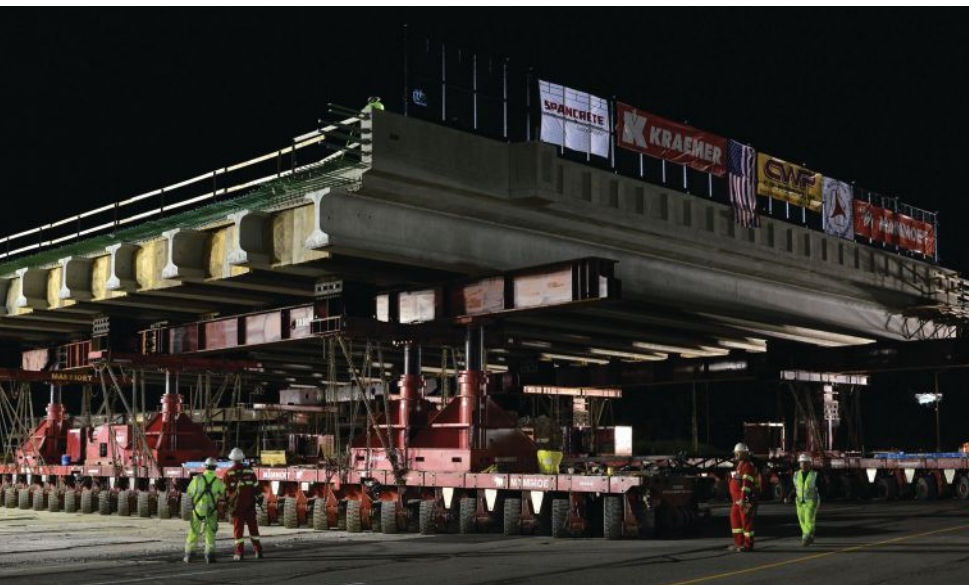
help address the potential problems that may occur elsewhere," predicts Dour. (For more on the West Seattle Bridge emergency repairs, see the Summer 2022 issue of *ASPIRE*®.)

Franklin Avenue Bridge

Rehabilitation of the Franklin Avenue Bridge over the Mississippi River in Minneapolis, Minn., was another good fit for KNA. This project involved innovations using ABC, owner collaboration through CMGC, and the use of ultra-high-performance concrete (UHPC). To minimize traffic delays and maximize public safety during construction, a 90-day ABC window was established.

Originally constructed in 1923 and previously rehabilitated in 1970, the Franklin Avenue reinforced concrete arch bridge was in a deteriorated state and required substantial rehabilitation. Hennepin County worked with KNA to develop repair solutions—including removal and replacement of pier caps and the reinforced concrete bridge deck—that could be completed within an accelerated schedule.

The project included the removal and replacement of 39 concrete pier caps, installation of 350 new and unique 14-in.-thick precast concrete deck panels, installation of 43 new pier and spandrel cap beams, and placement of 350 yd³ of UHPC. KNA cast each of the 350 deck panels to ensure that the reinforcement of the adjacent panels fit. (See the Summer 2017 and Winter



2018 issues of *ASPIRE* to learn more about the rehabilitation of the Franklin Avenue Bridge.)

Park Road Bridge

In a joint venture with Peterson Contractors, KNA built the Park Road Bridge in Iowa City, Iowa. This cast-in-place concrete through-arch bridge has a center span length of 250 ft and varies in width from 90 to 110 ft. The signature design is part of the larger Iowa City Gateway Project to mitigate problems from extreme flooding. Completed in 2018, the new bridge spanning the Iowa River is situated 1 ft above the 200-year flood level. It sits on pier foundations supported by 28-ft deep, 8-ft-diameter drilled shafts. The project used 3600 yd³ of concrete, 1.6 million lb of reinforcing steel, 258,000 lb of post-tensioning strand, 32 precast, prestressed concrete floor beams, and 20 bridge-hanger assemblies. The bottom of the arch is 18 ft from the top of deck.

Rail Transit Projects

For more than half a century, KNA has participated in freight-rail, commuter-rail, and light-rail transit construction


projects across the United States. To minimize the costs associated with construction outages, the firm offers clients a comprehensive planning and switch-out process, engineering expertise, experienced personnel, and specialized equipment. KNA's abilities in the rail transit sector are demonstrated by the many railroad switch-outs under tight time frames that the contractor has completed.

Each railway project involves a distinctive set of challenges. Such was the case for the replacement of a deteriorated 285-ft-long railroad bridge owned by Canadian Pacific Railway over Little Cedar River near Charles City, Iowa. KNA self-performed 100% of the work during the 6-month construction schedule. The project posed several construction challenges. Seasonal weather compressed the schedule and the bridge change-out had to be completed before spring runoff. Another challenge was raising the bridge as much as 17 in. within 6-hour work windows to accommodate an active railway. The bridge comprises six 35-ft spans and two 20-ft spans using 30-in.-

deep double-void precast concrete box beams and precast concrete pier caps and abutments. The bridge change-out required seven phases with only brief periods when rail traffic was interrupted.

Set Apart

Proactively addressing potential issues through careful planning has allowed KNA to shine in the construction of complex bridges and alternative delivery methods. Owners reap the benefits as KNA meets demanding schedules, reduces the risks and costs of uncertain outcomes, and collaborates as a team, without sacrificing quality.

In an industry known for its ups and downs, and despite the recent pandemic and market uncertainties, KNA has experienced over a decade of record, profitable growth. With 662 employees, the firm is approximately four times the size it was 10 years ago. Frequently listed by *Engineering News-Record* as being among the top of its field, KNA continues to thoughtfully pursue innovative and challenging projects that align with the firm's core values. 

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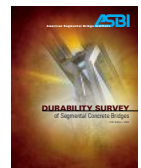
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