ACEC
*Wisconsin*


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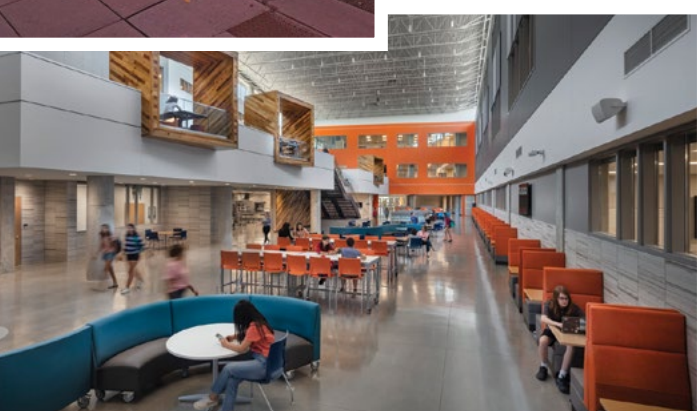
# ENGINEERING
## EXCELLENCE AWARDS

A CLOSER LOOK AT HOW ENGINEERS MAKE IT HAPPEN





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ACEC Wisconsin

# ENGINEERING

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ACEC WI members develop innovative solutions that increase our state's economic growth. Facing a complex issue? They collaborate with stakeholders to successfully design our state's future.

## ENGINEERS PROMOTE WISCONSIN'S GROWTH

**HUMAN MOVEMENT**
Infrastructure for multi-modal movement (land, air and water)

**WATER RESOURCES**
Drinking water, wastewater and stormwater

**VERTICAL STRUCTURES**
Public and private entities

**ENVIRONMENT**
Recycling, solid waste, brownfields and remediation

**UTILITIES/ ENERGY**
Communication and power generating infrastructure

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**AMERICAN COUNCIL OF ENGINEERING COMPANIES OF WISCONSIN**

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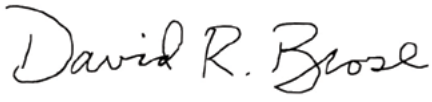
# CONTENTS



# Engineering Excellence Awards Recognize Outstanding Professional Work

## ENGINEERS MAKE IT HAPPEN



**Dave Brose, PE**
**ACEC Wisconsin Chair**

The American Council of Engineering Companies of Wisconsin is excited to celebrate the 2022 Engineering Excellence Awards. These projects add to the program's over 50 years of outstanding engineering achievements.

Twenty-four projects were submitted for this year's competition, showcasing many different aspects of creative engineering solutions from Wisconsin companies. The projects range from stormwater improvements and green infrastructure to bridge replacements and riverwalk installations. Each project submitted has its own unique aspects highlighting the talents and skills of our professional engineers.

These projects would not be possible without a team of engineers, planners, technicians and scientists who all collaborate with their clients to produce truly outstanding results. The diverse teams combine the innovative ideas of the new graduate engineers with the proven experience of seasoned project managers and designers to solve client challenges. The award winners represent ideas for the future incorporating new technologies and visions to make the world a better place.

ACEC Wisconsin is proud to celebrate the achievements of the engineering professionals who bring their clients' ideas to reality. We also celebrate the owners and public officials who entrust their project to our engineering teams.

Many of the projects in this year's competition were procured through a Qualifications-Based Selection (QBS) process; these projects are highlighted with a red ribbon. This is an important aspect in the selection process for engineering teams. QBS allows engineers to be innovative, creative and flexible, thereby giving our clients the best results possible, saving in costs during the construction phases and providing the best value to our clients and owners.

On behalf of the ACEC Wisconsin Board of Directors, I would like to congratulate this year's award-winners, and to encourage our member firms to start thinking about the great projects that could be eligible for next year's competition. I would also like to thank the sponsors of this publication for their support of our Engineering Excellence Awards program and ACEC Wisconsin. Their support helps to provide visibility for all our member firms and helps to spread the word on how engineers make it happen by making our lives safer, easier, happier and healthier.

# Engineering Excellence Awards

## RECOGNIZING EXCEPTIONAL IDEAS & INNOVATIONS IN ENGINEERING

Like the Academy Awards for the film industry, the Engineering Excellence Awards highlight the best of the best in professional engineering. ACEC WI's Engineering Excellence Awards program recognizes and celebrates engineering achievements that demonstrate the highest degree of skill and ingenuity. Established in 1970, this statewide competition effectively ensures firms achieve the recognition they so richly deserve.

Through exceptional engineering design, these award-winning projects significantly contribute to the quality of life of the state's citizens. They also recognize the design professionals involved for their expertise and dedication to the profession. The 2022 winners strengthened our infrastructure, enhanced public safety and bolstered the economy.

The winning projects focus on public health and economic growth through cost-effective solutions. These engineers developed innovative solutions that successfully tackle complex issues.

Congratulations to all our award-winning firms and clients on your outstanding projects! An Engineering Excellence Award is a tribute not only to the winning project and design firm, but also to the clients, owners, subconsultants, contractors and everyone else who played a role in making these projects a reality.

## Qualifications-Based Selection

### DELIVERING WINNING PROJECTS


Many of the award-winning projects were procured using Qualifications-Based Selection (QBS). On the following pages, a QBS label indicates projects that were procured using QBS. QBS is a proven process to help owners find the highest-qualified engineering or architectural firm or team for a project. Page 31 of this magazine provides information on the QBS process.

## The following 2022 Engineering Excellence Awards were presented:

**STATE FINALIST**

**State Finalist Awards** are presented to entries demonstrating a high degree of client satisfaction through quality, cost-effective solutions. This year, ACEC WI presented 16 State Finalist Awards.

**BEST OF STATE**

**Best of State Awards** are presented to entries representing the highest degree of technical innovation, client satisfaction and contributions to the engineering industry. Best of State winners are eligible to compete in the ACEC National Engineering Excellence Awards competition. This year, ACEC WI presented eight Best of State Awards.

**GRAND AWARD**

**Grand Award** is selected from the Best of State winners. It is the entry the judges felt best represented the spirit and criteria of the competition. The Grand Award will be announced at the Awards Banquet.

## Judging & Awards

A panel of highly qualified judges reviewed this year's entries. Each entry was judged on its own merits and specifically on the role of the engineering firm submitting the project.

The panel used the following criteria to evaluate each submission:

- Original or innovative application of new or existing techniques
- Future value to the engineering profession and perception by the public
- Social, economic, and sustainable design considerations
- Complexity
- Exceeding client/owner needs

Each entry was truly an example of excellence in engineering, which made the judges' deliberation difficult.

## 2022 Engineering Excellence Awards Judging Panel

**Brandon Braithwaite, PE**
Wisconsin Department of Natural Resources

**Sharon Bremser, PE**
Aurigo Software Technologies

**Tom Buchholz, PE**
Wisconsin Department of Transportation

**Jerry Deschane**
League of Wisconsin Municipalities

**Jake Ehmke, PE**
Wisconsin Division of Facilities Development

**Mark Kruser, AIA**
OPN Architects

**Errin Welty, CEcD**
Wisconsin Economic Development Corporation

## Engineering Improves Our Lives

Each of our projects covers at least one of the core facets of engineering – environment, human movement, utilities/energy, vertical structures and water resources. Look for these symbols on each project to see which areas that project addresses.

**Human Movement**
Infrastructure for multi-modal movement (land, air and water)

**Water Resources**
Drinking water, wastewater and stormwater

**Vertical Structures**
Public and private entities

**Environment**
Recycling, solid waste, brownfields and remediation

**Utilities/Energy**
Communication and power generating infrastructure

# Congratulations to All Engineering Excellence Award Winners!

*USH 18/151 (Verona Road) Reconstruction Stage 2 — Wisconsin Department of Transportation — Madison, WI*

*Marquette Interchange Green Infrastructure Project — Milwaukee Metropolitan Sewerage District — Milwaukee, WI*

*Town Square — City of Janesville, WI*

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# BEST OF STATE

## 87TH STREET RECONSTRUCTION

**GRAEF** **CLIENT:** Milwaukee Regional Medical Center

QBS

High visibility bike lanes and modern signaling enhance safety for bikers and pedestrians.

The Milwaukee Regional Medical Center (MRMC) is southeast Wisconsin's most important medical hub. Its Level 1 facilities are nationally recognized for the level of care they can provide and the facilities cover both adults and children. The 19,000 employees that travel in and out daily combine with 1.5 million patients and visitors yearly to create a traffic nightmare. The old 87th Street could not cope with the constant and increasing demand.

> "The 87th Street Reconstruction project addressed many challenging aspects through the project delivery process. It also completed construction of the improvements while preventing utility service shutdowns to the Medical College due to its status as SE Wisconsin's only Level I Adult/Pediatric Trauma Center. I was impressed by the consultant team's attention to detail."
>
> *- Awards judge Jake Ehmke*

### Designing with Health and Safety in Mind

GRAEF took on the challenge of designing a modern entrance to MRMC. The design is based on a model which prioritizes safe bicycle and pedestrian accommodations. In addition to relieving car traffic pressure by providing alternative ways to get to the campus, it aligns with MRMC's vision of better health for the region. The team knew that maintaining access during construction was critical. They staged construction so that the road was always open, even through extended delays.

### Keep Wisconsin Healthy and Moving

The design creates a safer and more efficient roadway for all users. The new 87th Street provides first-class transportation to MRMC so that its facilities can continue to provide first-class medical service to southeast Wisconsin.

With smart construction staging, the road stayed open, preserving access to the medical complex.

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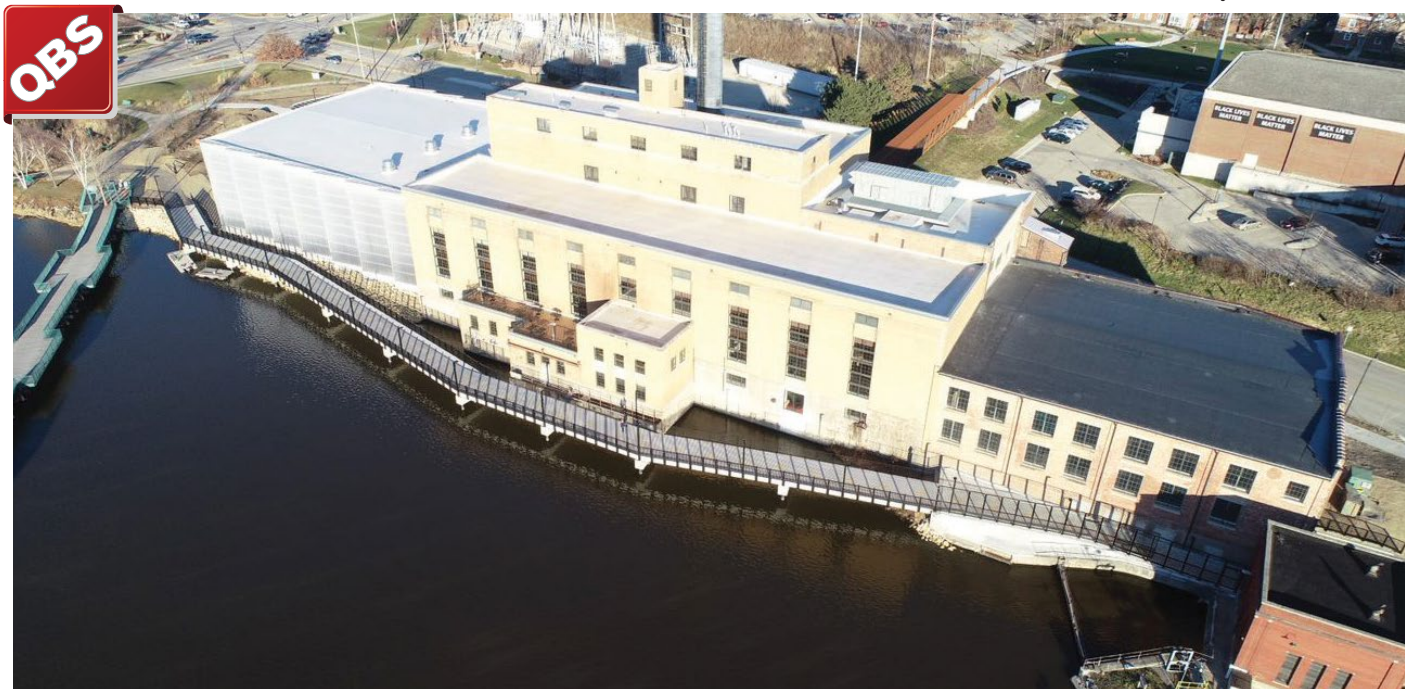
# BEST OF STATE

## BELOIT POWERHOUSE RIVERWALK

**JEWELL ASSOCIATES ENGINEERS INC. & RH BATTERMAN & CO INC.** **CLIENT:** City of Beloit

QBS



The new path provides a special view of the Rock River for users.

The City of Beloit is quickly redeveloping its downtown from its industrial past. An existing path system provides pedestrians greater access to the downtown and the beautiful Rock River. An old powerplant is now the future home of the Beloit College Union: The Powerhouse. However, these assets were not well connected. Since the path system did not extend to the new student center, users had to walk along a busy roadway.

> "This project addressed numerous hurdles to complete a missing link within a popular bike trail while complementing an impactful adjacent redevelopment project. Working with multiple local and state partners to design a functional path while protecting the Rock River created a finished project that will be used by many in the community for years to come."
>
> *- Awards judge Errin Welty*

### A New View in Beloit

Jewell Associates and RH Batterman cooperated to fill a critical link in the system. Jewell designed a pedestrian bridge alongside the future student center that serves multiple functions – it connects the new development with existing paths and gives users a beautiful view of the river. The foundations were reinforced so it can serve as a base for a new deck for the student center. The team also redesigned the path leading up to the bridge so that it was further set back from the adjacent road to improve safety.

RH Batterman contributed to the design and provided survey support. Additionally, the team provided construction oversight which kept the project moving. Oversight was especially valuable to meet stringent environmental standards while working over the Rock River.

### Connecting the City

Beloit now has another piece in its redevelopment. The riverwalk provides a safer, more reliable pathway while implanting cost-saving measures, minimizing impacts to the river.

This path connects existing trails to the future site of Beloit College's student center.

BEST OF STATE

# CITY OF BRODHEAD WATER QUALITY TRADING

**MSA PROFESSIONAL SERVICES INC.** **CLIENT:** City of Brodhead

The new treatment system mitigates waste runoff, a major contributor to phosphorus pollution.

Small communities face difficult challenges in their water treatment programs. In addition to general maintenance and facility improvement, improving environmental regulations place further strain on the system. For Brodhead, its wastewater treatment facility was in good working condition, but upgrades were required to meet new phosphorus limits.

> "What MSA accomplished for the community of Brodhead is a stunningly successful model of win-win collaboration. The city was saved from a multimillion-dollar sewer system upgrade, farmers were assisted with land management practices that will improve their efficiency and reduce their environmental footprint. This was truly brilliant work."
>
> *- Awards judge Jerry Deschane*

## A Broad Look at Water Treatment

MSA Professional Services took a holistic approach to the problem. Rather than focusing solely on the treatment plant, the team looked at the local water system. Searles Creek was identified as the linchpin in the system. Engineers stabilized 62 streambanks to reduce sediment buildup.

Agricultural users were also brought into the process. The design team created a new treatment system for manure from a major farm in the area. This collaboration virtually eliminated runoff from the farm, which was one of the biggest contributors to phosphorus pollution in the local water system.

## Making A Big Impact

These changes formed the backbone of a water quality trading system. The new system removes 1,090 pounds of phosphorus per year compared to the 190 pounds per year that would have been removed from treatment plant updates. The project clocked in under $1 million and is estimated to save the community more than $3.8 million over the lifecycle. The holistic approach by the design team made a huge difference for the community and the environment.

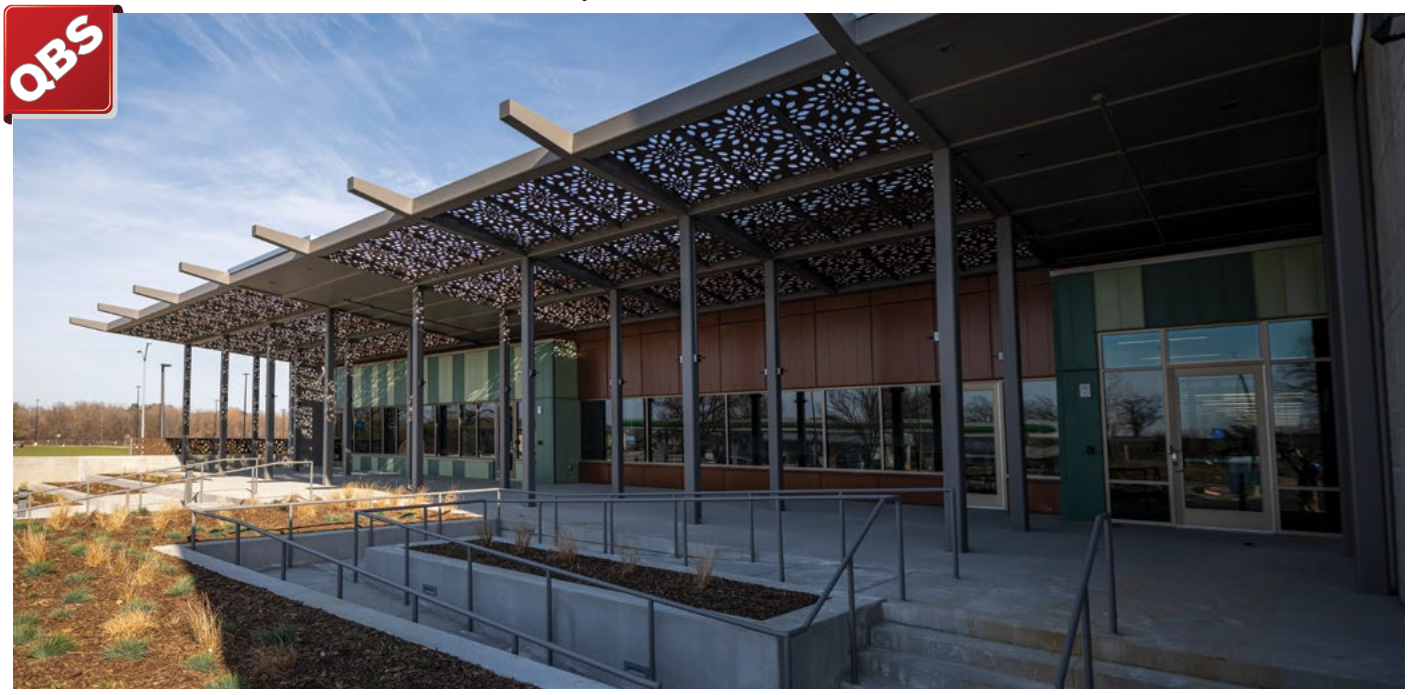
Searles Creek is a linchpin in the local environment and protecting it was paramount.

# BEST OF STATE

## CITY OF MADISON NAKOOSA TRAIL FLEET/FIRE/RADIO SHOP FACILITY

**MEAD & HUNT INC.** **CLIENT:** City of Madison

QBS



The design is specifically tailored to match the local aesthetic, creating a welcoming environment.

The city of Madison faces a daunting challenge in providing services to residents. Behind the scenes, the Fleet Services Division maintains over 1,400 vehicles of widely different profiles and purposes. Maintenance facilities were spread out and could not accommodate the size of many newer vehicles.

> "We can all appreciate the importance of keeping first responder vehicles in top-notch condition. This state-of-the-art facility earned LEED Gold certification, saving the city a projected $300,000 to $400,000 annually in utility and operating costs. It establishes a high bar for other communities and the private sector businesses to emulate. Very impressive!"
>
> *- Awards judge Mark Kruser*

### Energy-Aware Structure Design

Mead & Hunt worked closely with the city to create a new solution that will serve needs for the next 50 to 75 years. Instead of separate facilities, all maintenance is now done in one large building. This centralizes operations and saves money. The new facility focuses on energy sustainability and worker comfort, both of which are unusual in buildings like this. High-efficiency lighting and heating systems improve efficiency and save thousands per year in energy costs. Heated floors give additional comfort to works who stand on their feet all day.

The location of the facility mattered too. The team needed to find a space that could accommodate a massive facility but also did not negatively impact the surrounding community. A vacant grocery store provided the answer. An open house showcased the new design and increased understanding of the Fleet Services Division.

### Designing for the Future

The new facility revitalizes an abandoned space, provides long-term support for city services and saves money. The design team went above and beyond to meet the client's needs.

The new facility can accommodate future needs, including larger busses and support vehicles.


# With engineering, everything is possible.

## ENGINEERS MAKE IT HAPPEN

# LEO FRIGO SOFTWARE FOR PILE DETERIORATION

**MICHAEL BAKER INTERNATIONAL** **CLIENT:** Wisconsin Department of Transportation

In 2013, the piles dropped and a catastrophic shift in the bridge occurred. (*AP Photo/Press-Gazette Media, Jim Matthews)*

The Leo Frigo Memorial Bridge is an 8,000-foot structure that carries 40,000 vehicles per day over the Fox River. In 2013, the bridge suddenly dropped two feet, requiring an emergency closure of I-43 in Green Bay as Michael Baker International worked to quickly address the issue. After that quick intervention, the team worked together to prevent this from happening in the future.

> "The Leo Frigo Software project was a great solution to a hopefully uncommon problem - sinking support piles. I hope the lessons learned will be shared throughout the bridge inspection community and will further progress the knowledge base of bridge engineering."
>
> *- Awards judge Brandon Braithwaite*

## From Problem to Prevention

Michael Baker and the Wisconsin Department of Transportation determined the original issue was due to corrosion of the piles holding up the structure. After the emergency fix, the team installed monitoring devices on the piles. The immediate benefit was the ability to monitor and forecast potential corrosion to ensure safety. The long-term benefit was a wealth of data about the effects of the soil environment on the piles.

Data was gathered over a five-year period. This unique project required a unique solution. The design team created its own software to analyze the data. The software used the data to devise a formula that can be applied to other bridges to determine corrosion rates. This forecasting information is immensely valuable. WisDOT can now take action to prevent, delay and reduce deterioration of monitored bridges

## Better Living Through Formulas

The original failure of the Leo Frigo was a wakeup call for better management of the hidden elements of bridges. Using the data gathered from this project, many bridges can be monitored for future corrosion, significantly improving public safety.

This panel collected data from all corrosion instruments for a five-year period.



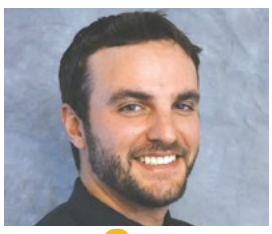


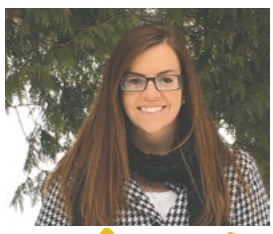
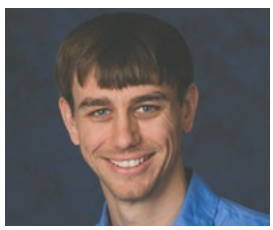








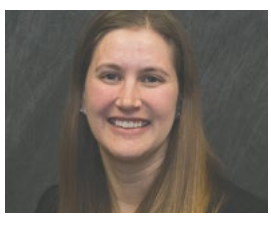


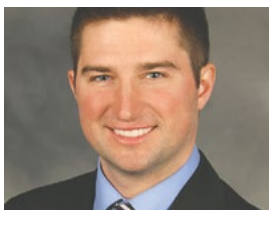



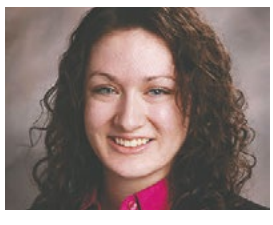
# Congratulations

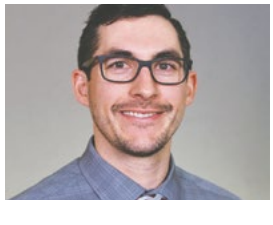
## LEADERSHIP INSTITUTE

## Class of 2022



# NEW BIOGAS BOILER: MORE THAN A BOILERPLATE SOLUTION

**DONOHUE & ASSOCIATES INC.** **CLIENT:** City of Appleton

QBS

Two huge anaerobic digesters process billions of gallons of wastewater yearly.

The Appleton Wastewater Treatment Plant is an environmentally sustainable facility. It treats over 5 billion gallons of wastewater annually and two large anerobic digesters create biogas for heating. However, the biogas varied in concentration and was inefficient to use. The facility looked for a way to improve and become more sustainable.

> "Donohue designed a new 5.5 million BTU biogas boiler, biogas compression system to feed the three boilers, controls, stainless steel piping and re-configured the biogas storage vessel piping for a flow-through design. This is the first time this technology has been used in Wisconsin and came in 12 percent under budget. Nice job."
>
> *-Awards judge Tom Buchholz*

## Adding Consistency to the Mix

Donohue & Associates has extensive experience with biogas. After reviewing the system, the team determined a new optimization process was needed. Previously, the biogas was pushed directly from the digesters to the boilers. Now, the gas goes from the digesters to a stabilization tank which homogenizes the gas. A condensate trap in the stabilization tank draws out moisture, improving the quality of the gas. The biogas is then pulled into a compressor that increases its potency and then is finally fed to the boilers.

The new system delivers a consistent high-quality product to the boilers. The new system did not require major facility expansion and meets the client's goal of environmental sustainability. By running at peak efficiency, the boilers save $100,000 annually.

## Exceeding Client Expectations

Using their years of experience, the design team developed a cost-effective solution that saves money and continues Appleton's goal of environmental sustainability.

This compressor was a vital part of the stabilization and homogenization process for biogas.

# BEST OF STATE

## RESCH EXPO

**GRAEF**

**CLIENT:** Village of Ashwaubenon

QBS


The new center is an attractive venue for a wide range of events in the Green Bay area.

When people think of Green Bay, they probably think of football. But when there is a need for an all-weather venue that supports a wider range of activities, the Resch Expo, located across the street from Lambeau Field, should come to mind.

> "GRAEF's innovation to accelerate design and construction timelines by using collaborative technology is the future for all successful projects. The Resch Expo is a critical piece for promoting economic growth for the Village of Ashwaubenon."
>
> *- Awards judge Sharon Bremser*

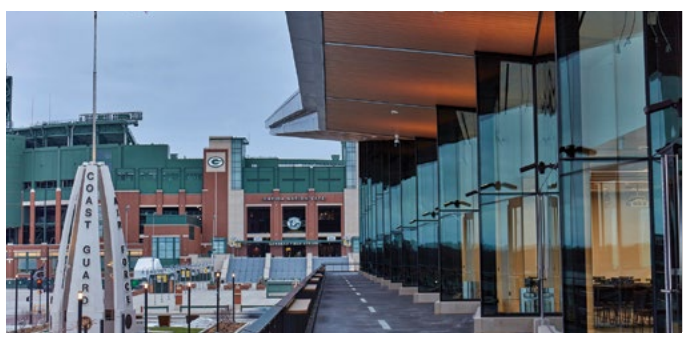
### Game-Changer

GRAEF's structural engineering expertise was vital for a facility that supports Green Bay's Titletown District. Resch Expo is a flexible space that can meet many needs. To achieve flexibility, the design team avoided using support columns. Instead, a huge cantilever roof was installed with multiple 280-foot-long steel trusses. The length of these far exceeds what is normally used in arena design and required careful installation. Because construction took place in winter, the trusses were designed to absorb the dramatic temperature changes during and after construction.

Winter construction was necessary to support the Green Bay Packers' bid to host the 2022 NFL Draft. The design team used a new trademarked construction process to accelerate completion of the arena. The acceleration involved careful construction staging and shaved more than two months of the completion time. The venue opened in January 2021, much earlier than expected.

### A New Famous Arena

The Resch Expo is a critical piece of the region's economic development. It expands the Titletown District beyond football to a space that can accommodate a wide variety of events. It is a full partner of Lambeau Field and gives the region a multi-purpose entertainment district.




The center's partnership with Lambeau Field will dramatically expand entertainment options.

# USH 18/151 (VERONA ROAD) RECONSTRUCTION STAGE 2

**STRAND ASSOCIATES INC.** **CLIENT:** Wisconsin Department of Transportation

QBS

The new design minimizes at-grade intersections, maintaining traffic flow and improving safety.

Madison is the fastest growing metropolitan area in Wisconsin. This growth requires expansion of transportation resources as suburbs grow, new ones pop up and people move around. Verona Road is one of the backbones of this transportation network and expansion was urgently needed.

> "This project was very complex and required detailed construction staging plans to build in this growing corridor in Dane County. The completed project improved traffic flow, safety and local connectivity for pedestrians and bicyclists. The project was completed on time and under project. Well done."
>
> *- Awards judge Tom Buchholz*

## Designing for the Future

Strand Associates has worked on Verona Road improvements for years. The core element of this segment was to raise Verona Road over a busy county highway. The traffic volume caused major backups and safety issues. The new design uses a single point urban interchange to move large volumes of traffic and provides the design team with space to support the road above. This was only the second use of this design in the United States.

Other at-grade intersections were renovated to avoid stop-and-go traffic. A rarely used tight urban diamond interchange saves space. A new seven-span bridge raises a state bike/pedestrian trail, considerably improving safety and keeping traffic moving. Supplemental streets in the area were improved so the whole experience is a lot more efficient and doesn't back up onto the main roads.

## Another Stage, Another Success

The second redesign phase of Verona Road made an immediate impact. In one year since completion, corridor crashes have decreased 60 percent and travelers saved over 300,000 hours of delay and associated emissions.

This single point urban interchange with offset footing is only the second of its kind in the nation.

STATE FINALIST

## ANDREWS ROAD EXTENSION

### SHORT ELLIOTT HENDRICKSON INC.

**CLIENT:** City of Black River Falls

The extension of Andrews Road was an important goal for the city of Black River Falls to provide a vital connection to US 12, increasing access for businesses and tourism. The project was continually delayed by funding and environmental concerns and its completion began to look like a pipe dream.

Short Elliott Hendrickson (SEH) designed a solution that moved the project back to reality. The team worked with the client to develop a Tax Increment Financing District. This is a common funding mechanism that helped the client pay for the project. SEH also created a flexible construction schedule that would complete the project over a full year. This flexibility reduced costs and still met the client's goals.

The next challenge was minimizing environmental impacts. The extended Andrews Road crossed wetlands and the locally important Coffee Creek. The design team reviewed a wide range of options to preserve the environment. In addition to standard stormwater and runoff mitigation techniques, the team hit upon a unique alignment for the roadway. This alignment avoided most wetlands and created the shortest span possible over Coffee Creek.

The road twists and turns slightly to minimize environmental impacts.

This project was one of the biggest in the Black River Falls' history. SEH worked with the city throughout the process to overcome all barriers and turn a dream into reality.

STATE FINALIST

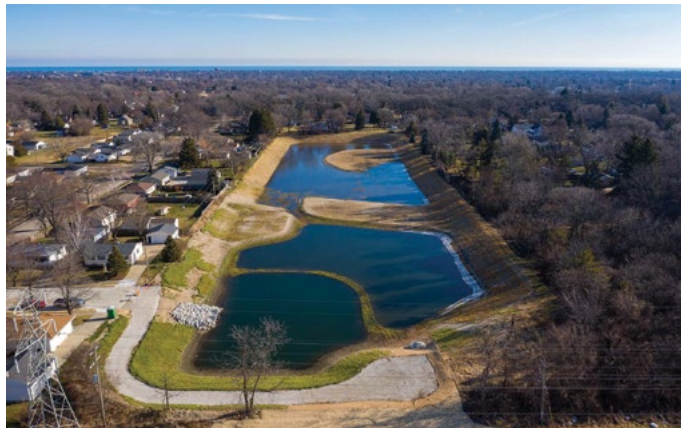
## CITY OF KENOSHA STORM WATER IMPROVEMENTS

**RUEKERT & MIELKE INC.** **CLIENT:** City of Kenosha

In 2017, the city of Kenosha was hit with catastrophic flooding with almost eight inches of rain in two days. The odds of this happening are 0.5 percent in any given year. After the immediate safety and environmental concerns subsided, the city wanted a better way to deal with this level of rainfall.

Ruekert & Mielke has a long-standing relationship with the city. The firm had already reviewed the client's stormwater infrastructure and this information helped shape the response. The biggest project was a 90-acre flood control facility. It will divert floodwaters in times of heavy rain to keep from spilling over onto streets and into basements. The large space is expected to significantly mitigate flooding risks. The facility itself replaces an abandoned engine plant and has been incorporated into overall redevelopment plans for the neighborhood.

The team also targeted a specific area that experienced the worst flooding and designed a 50-acre stormwater detention and flood control facility that will directly minimize flooding for the Gengler sub-basin and protect nearby neighborhoods. The project will also improve water quality for the area.



The stormwater detention basin makes a difference during flooding events.

Even with such a low risk for such flooding events, the city of Kenosha was proactive and is now prepared to deal with major rainfall, thanks to the thorough planning by the design team.

STATE FINALIST

## CTH-DM AND CLINTON ROAD RECONSTRUCTION

**BAXTER & WOODMAN INC.** **CLIENT:** Village of Windsor

Drainage in Morrisonville was so bad that residents nicknamed their town "Frog Town USA" because of the amount of water standing around. Existing drainage ditches weren't working, and the nearby Yahara River meant that any rainfall event ended with flooded basements and washed-out roads.

Baxter & Woodman immediately crafted a solution to improve drainage to the Yahara River. Houses along the road had limited elevation resulting in pooling water that inevitably end up in their basements. This water had to be diverted. A new drainage system provided three major ways for rainfall to reach the Yahara River. Extra-large culverts and new drainage swales improve existing ditches and provide maximum effect.

The design team also reconstructed the main road to minimize additional runoff. The previous road had pushed water toward basements instead of ditches. A valley curb was installed, which diverted rainfall to drainage ditches. In the ditches themselves, a gravity drain system was implemented. This collected water in specific places that were best for drainage and countered the low-lying elevation near the river.

Ditches collect the runoff from the road and push it to larger drains before it backs up into driveways and basements.

Since the solution was implemented, no basement flooding has been reported and standing water is at a minimum. This solution makes everyone happy, except maybe the frogs.

STATE FINALIST

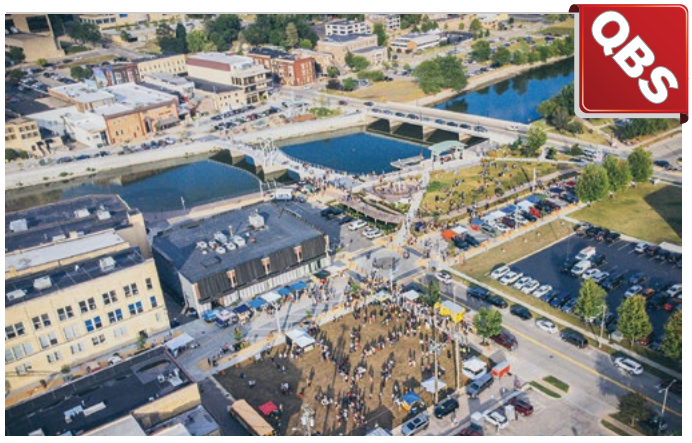
## JANESVILLE TOWN SQUARE

**STRAND ASSOCIATES INC.** **CLIENT:** City of Janesville

In 2008, the city of Janesville embarked on a strategy to revitalize its downtown and improve quality of life for its citizens. Failing structures and poor infrastructure drove people away and hurt the city. A comprehensive plan was developed to turn the dream into reality.

Strand Associates came on with a wealth of expertise on the interlocking problems involved. A brownfield site and two decrepit parking garages were identified as a space that could be redeveloped to anchor future plans – this would become Janesville Town Square. The design team facilitated a series of real estate acquisitions and building demolitions to secure the space. Demolition was an environmentally sensitive process as contaminated soils were removed to prevent damage to the nearby Rock River.

In addition to the myriad of stakeholders involved in acquiring the space, the design team also worked closely with the Department of Natural Resources. The next step was to utilize the Rock River as a draw for residents and visitors coming downtown. Special permits were gained so that the team could redesign a downtown pedestrian bridge to bring people into the new square. This iconic bridge is a core part of Janesville's vision for its downtown.




The new town square area is a focal point for activities and a huge draw for residents and visitors.

The new town square is the heart of the city's plan to redevelop its downtown. The design team turned a vision into reality.

STATE FINALIST

## MARQUETTE INTERCHANGE GREEN INFRASTRUCTURE PROJECT

**STRAND ASSOCIATES INC.** **CLIENT:** Milwaukee Metropolitan Sewerage District

The Marquette Interchange in Milwaukee is the second-largest interchange in Wisconsin. Underneath the interchange is 16 acres of unused space. The space collected untreated runoff from the interchange and pushed it into local waterways. The client looked for an environmental solution for the land.

Strand Associates saw an opportunity to make a big environmental difference. Green infrastructure is not typically installed underneath overpasses. The team had to find plants capable of surviving low sunlight and high salt runoff from the interchange. The final design features 8,600 square feet of bio-retention basins, 4 acres of native plants and a small path and plaza system within the area. The green area captures the first inch of rainfall and has the capacity to retain and naturally treat more than 290,000 gallons of runoff. This is processed by plants before it goes into the Menomonee River and ultimately Lake Michigan, substantially improving the natural environment.

Beyond treatment comes education. The access paths and plaza are supplemented with educational information about how the system works. This is an opportunity for local students and residents to learn more about the importance of native plants and green engineering for cleaning up the ecosystem.

The green space adds life and color to a space that is usually gray and ignored.

The design team handled a unique challenge with an innovative, green solution that beautifies and protects an area of previously forgotten land.

STATE FINALIST

## N. 2ND STREET

**ALFRED BENESCH & COMPANY** **CLIENT:** City of Milwaukee

North 2nd Street is a very important road in Milwaukee's entertainment district. It is a vital pedestrian access point for the newly remodeled Bradley Symphony Center and other venues. The old design looked and functioned more like a normal city street with major impacts on safety and traffic flow.

Alfred Benesch & Company developed a solution with a very limited budget and under specific time constraints. The redesigned street had to be open in time for the Milwaukee Symphony Orchestra's season. The design team conducted a value planning workshop to hear from stakeholders and users on the most important aspects of the redeveloped road.

Key design components addressed user's concerns for an accessible, safe area for pedestrians, limited vehicle traffic and a vibrant atmosphere for users.

Advanced traffic calming measures were implemented to make sure vehicles using the road were acutely aware of pedestrians and moving at slow speeds. An innovative curbless street design made the entire block accessible for pedestrians and facilitated flow during busy times before and after symphony shows. Finally, a trench drainage system channels rainwater away.

The new wellhouse was placed on public land, avoiding time-consuming and costly land acquisition processes.

The rehabilitated corridor was open in time for the symphony and exceeds client expectations. The new street is a vibrant example of how a city street can serve a myriad of functions.

STATE FINALIST

## NELSON FAMILY HERITAGE CROSSING

**GRAEF** **CLIENT:** City of Kaukauna

The Fox River is an incredible natural resource. Communities adjacent to the river have used it for economic and entertainment purposes for decades and have continually redeveloped their infrastructure around it. Currently, there is an extensive path system near the river and an active lock system, but many paths were inaccessible to each other without this crossing.

GRAEF's primary mission was to develop a bike/pedestrian bridge to connect three miles of paths to the broader network. First, the team worked with the Coast Guard to maintain navigation on the river. To accomplish this, the distance between supports on the bridge was expanded. The increased distance required reinforced, strong materials that would be able to support the spans above.

The design team overcame difficult soils and river hydraulics as well. To properly reinforce the structure, the team anchored the midpoint at a small island in the river. The design team worked carefully around unstable soils and shallow bedrock. Acquisition of a nearby railroad bridge allowed the path to use a shorter route which avoided questionable soils and saved over $100,000.


The bridge entryway welcomes users to the area and provides the history of the area.

Many segments of this path system were previously inaccessible to the public. With the new bridge, these paths are now part of a 13-mile network around the Fox River, benefitting visitors and residents of the surrounding communities.

STATE FINALIST

## SE FREEWAY IHSDM AND VISSIM ANALYSIS

**raSMITH** **CLIENT:** Wisconsin Department of Transportation

The Wisconsin Department of Transportation manages the state's roadway infrastructure and is constantly working on projects to improve safety and traffic flow. With limited resources, future planning is a vital step and occurs years ahead of time to ensure the roads are built when needed.

raSmith partnered with the department in the busiest area of the state – the southeastern freeway system. The overarching goal was to develop a model that would present clear cost/benefit analysis of future freeway improvements. Interactive Highway Safety Design Model (IHSDM) is a program that can looks at a huge amount of data. The team focused on two elements: safety and the on/off ramps. The software can compare current stats with alternatives and find the best solution.

Another program used was a VISSIM analysis. This is traffic simulation modeling that looked at flow through the full system. A massive amount of data was collected from over 300 miles of freeway. Because this program and the IHSDM had never been used on such a scale before, the team developed new methods for processing this data and making it useful for the department.

The study looked at all elements of the interchange and analyzed the data for ways to improve the experience.

The analysis will help the department pick the best improvements to fund in the coming years. These targeted solutions will maximize benefits to users and minimize costs – exactly what the client wanted.

STATE FINALIST

## SOUTH MAIN STREET-GAARDER ROAD ROUNDABOUT

**SHORT ELLIOTT HENDRICKSON INC.** **CLIENT:** Village of Holmen

Faced with increasing traffic and decreasing safety, the village of Holmen knew that the intersection at the entrance to the town had to be redesigned. Because of its status as an entry point, this intersection needed extra flourishes to welcome in visitors.

Short Elliott Hendrickson provided multiple design concepts and worked with the village to identify the right roundabout to address backup issues and driver confusion at the existing intersection. A roundabout is the best design option here because it keeps traffic moving while lowering the risk of dangerous accidents. The roundabout design also allowed the team to stage construction in a way that kept the intersection open as much as possible to preserve vital access to the village. Additionally, the complete redesign included replacement of the storm sewer in the area to meet growing needs.

This roundabout features unique design elements that befits its position as a gateway to Holmen. Expanded landscaping and a town sign enhance the visual appeal. The landscaping also serves a functional purpose by providing stormwater management.

The design team worked through many alternatives with a wide variety of stakeholders to arrive at a roundabout as the solution. Because of that diligence and because of the extra care taken, the village of Holmen now has an entryway that meets its growing needs.


The roundabout's extensive footprint provides space for aesthetic elements that welcome people to Holmen.

STATE FINALIST

## SOUTH SMITH ROAD OVER TURTLE CREEK BRIDGE REPLACEMENT

**AYRES ASSOCIATES** **CLIENT:** Rock County Public Works Department

It was the best of bridges, it was the worst of bridges. The replacement of the bridge over Turtle Creek is a tale of two structures. Originally built in 1910, the original bridge was a local landmark with historical significance. However, the old structure supported one-way traffic, had a low weight limit and was showing its age.

Ayres Associates designed a plan to meet all needs. The first step was a new bridge. Because Turtle Creek is environmentally sensitive, the team created a solution to minimize work done near the waterway. In the end, the environmental documentation was almost double the size of a usual bridge replacement. The new concrete slab structure minimizes environmental impacts and can accommodate a unique design. The bridge will serve the community for decades.

The second step was preservation of the old bridge. It was eligible for placement on the National Register of Historic Places and was important to many locals. The Department of Transportation provided funds to help move the historic structure and a local farmer found a spot for the bridge on his family farm. It was carefully transported and has a new home.


The new bridge bends slightly to enhance sight lines and safety while crossing.

This tale of two structures shows how new infrastructure can provide for community needs and that old infrastructure can be preserved as well.

STATE FINALIST

## THE NICK: UW MADISON CAMPUS RECREATIONAL FACILITY

**GRAEF** **CLIENT:** UW Madison Recreation & Wellbeing

UW-Madison's primary recreational facility, the SERF, was not meeting expectations. Its windowless design from the 1980s created an uninviting atmosphere. Despite modest improvements, the facility suffered from structural problems and dramatically underserved the student body. A completely new facility was needed.

GRAEF started by looking at the problems plaguing the old facility. At the SERF, users complained about vibrations from all the activities in the venue. A vibrations specialist was brought in to help the team design structural trusses to stabilize the facility. Additionally, the layout of the facility was updated to isolate high impact activities. Stability was also vital for the running track that hangs three stories up, a unique draw that also saves space.

Another issue with the SERF was its pool facilities. The old pool didn't meet campus needs, couldn't support spectators and was leaking into the soil, undermining the foundations. The design team did geotechnical work to stabilize the footing of the new building. The new natatorium has an Olympic-sized swimming pool as its focal point and plenty of room for spectators. These new facilities are located on the lowest floor of the building, which required unique support from the structural trusses.


The new building's modern design provides ample natural light, a sharp difference from the SERF.

The new, multi-storied facility, named the Nick, offers light-filled spaces for fitness conscious Badgers of today and well into the future.

STATE FINALIST

## UNDERWOOD CREEK PARKWAY REPLACEMENT

**EXP US SERVICES** **CLIENT:** Milwaukee County

Oak Leaf Trail is a 125-mile mixed-used trail that circles Milwaukee County, providing multi-modal access to a huge amount of parks and other public attractions. The segment that runs on Underwood Creek Parkway is on-road, which makes it dangerous for bikers and pedestrians. Additionally, the road itself was in terrible shape made worse by the annual freeze/thaw cycle.

EXP US Services designed major changes to this road segment. Total reconstruction of the parkway allowed the design team to alter the design. Parking was shifted to just one side of the road and space was made to protect bike/pedestrian users. Two wide bike lanes keep traffic moving in this primarily residential area. The new design also reinforces the base of the roadway, which will limit maintenance costs.

The parkway takes special care to integrate into the local environment. The street runs alongside Underwood Creek so the design team implemented modern stormwater management techniques to protect the waterway. The street narrows slightly at points to avoid damage to mature trees and environmentally sensitive areas.

The newly redesigned parkway meets the needs of all users and revitalizes this important link in the Oak Leaf Trail system.

The new design features a speed bump to keep speeds down and promote pedestrian safety.

STATE FINALIST

## VERONA HIGH SCHOOL

**IMEG CORP.** **CLIENT:** Eppstein Uhen Architects **OWNER:** Verona Area School District

High schools and students' needs have changed a lot over the years. On the one hand, there is increasing demand for more programs, amenities and efficiencies to meet rising attendance. On the other hand, modern design can meet many of these demands with techniques that previous generations couldn't have dreamed of.

IMEG Corp.'s design work for Verona High School epitomizes that dynamic. The old school was plagued by overcrowding and increasing expectations. The new facility sits on 160 acres of land and is a landmark for the community. The heart of the building is a three-story atrium with ample natural light.

Beyond the expansion of services, the team's modern design decisions reduce maintenance costs. Improved HVAC and LED lighting make for a more comfortable environment and reduce energy needs. Smart energy recovery saves money and enhances sustainability. The key element is 21 miles of geothermal piping that provides heat and energy to the campus. The campus also includes a thoughtful security system to improve safety for students and faculty.

The common space at the core of the building promotes collaboration and features ample natural light.

This isn't your parents' high school – the new Verona High School is a marvel of modern education and engineering abilities. The campus will support the district's growing student population and provide top-tier education for a long time.

STATE FINALIST

## VILLAGE OF DEERFIELD TRUCKSTAR REDEVELOPMENT

**AYRES ASSOCIATES** **CLIENT:** Village of Deerfield

Truckstar Collision Center in Deerfield is a growing business and an important keystone in the community. The business was looking for room to expand, but the only available space was a blighted site with environmental issues spanning decades. The site was a danger to the community and an impediment on growth.

Ayres Associates has years of experience with remediating brownfields (a catch-all term for sites with environmental damage). It needed its full playbook to fix this space. First, the team helped the community and Truckstar navigate complex legal and financial issues related to site acquisition. Extensive testing and investigation determined the full extent of environmental damage. The Ayres team developed a plan for removing poisoned soils, capping the area and providing for future testing.

One of the biggest challenges was the environmental documentation and coordination with the Wisconsin Department of Natural Resources. The complex process took five years to address all concerns with the site. It is a testament to the perseverance of the design team, Truckstar and the village of Deerfield!

Truckstar's new facility turned a disused brownfield into a productive asset for the community.

Today, Truckstar is a growing business, supporting the growth of Deerfield. This project truly demonstrates engineering's ability to impact the quality of life through environmental solutions.

STATE FINALIST

## WIS 11 RECONSTRUCTION

**EXP US SERVICES** **CLIENT:** Wisconsin Department of Transportation

Wisconsin Highway 11 (WIS 11) is a key corridor in Racine's growing commercial district. The roadway, originally designed in 1973, was showing its age – poor visibility, high crash rates and lack of ADA-accessibility were just some of the issues.

EXP US Services completely redesigned a critically important stretch of this roadway. The first step was extensive real estate acquisition. The team wanted to expand the corridor's footprint to accommodate bike/pedestrian access and meet modern design standards. Ultimately, the right-of-way is more than 100 feet, improving safety and giving the design team more options for improving the corridor.

The final design solution makes a huge difference in downtown Racine. Beyond the standard quality of life improvements users have come to expect from their transportation network, the bus network now has proper ADA accommodations. Sidewalks and a large, shared curb lane provide ample safety and accessibility for all users. Dedicated turn lanes keep traffic moving and reduce crashes

The redesigned road uses road lines and signaled intersections to promote driver and pedestrian safety.

The reconstructed WIS 11 provides a safer, modern transportation corridor that meets the city's growing needs.

STATE FINALIST

## WIS 20, MAIN ST/1ST ST, VILLAGE OF WATERFORD

**raSMITH** **CLIENT:** Wisconsin Department of Transportation

Wisconsin has many small towns that enrich the fabric of the state. These towns feature downtowns rich in local small businesses. The village of Waterford exemplifies this and is officially designated a "Wisconsin Main Street" community. However, the actual main street was not capable of supporting the village as it needed.

raSmith faced two challenges – redesigning the corridor to meet the needs of downtown businesses and maintaining good traffic flow on this important road. The road connects the village to nearby interstates and brings in visitors and residents. The team first tackled the roadway design. The new design addressed limited sight lines and irregular curves that contributed to crashes and slowed traffic flow. The redesign also staged construction to keep traffic moving and preserved downtown parking.

The second stage was to make downtown a friendlier place for all users. Ample precautions were taken for bikers and pedestrians. Curb bump outs, high-visibility crosswalks and flashing beacons were added to increase safety. The design team worked with the business community to improve even the smallest elements; this attention to detail is a vital part of the village's appeal.


Curb bump outs and high-visibility crosswalks promote pedestrian safety.

The design team's efforts mean that this Wisconsin Main Street community has a main street that serves the needs of motorists, residents and businesses, exactly what you think of when you think of Wisconsin's small towns.

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# QBS

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2 **Selection**

3 **Negotiation**

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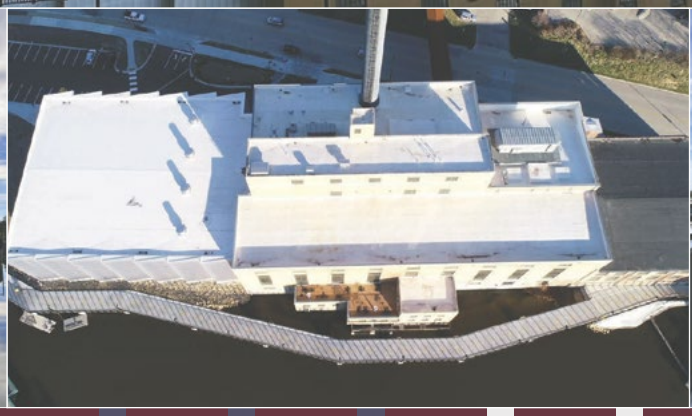

# Congratulations

## 2022 ACEC Award Recipients!

We congratulate the City of Beloit on the success of their project. The **Beloit Powerhouse Riverwalk** serves as a key connection providing access for students, faculty, and community members. This provides a system linkage between an existing shared use pathway system and the Beloit College Union: The Powerhouse. We are honored to be a part of their team.

Batterman
engineers surveyors planners

JEWELL
associates engineers, inc.

ACEC
Wisconsin