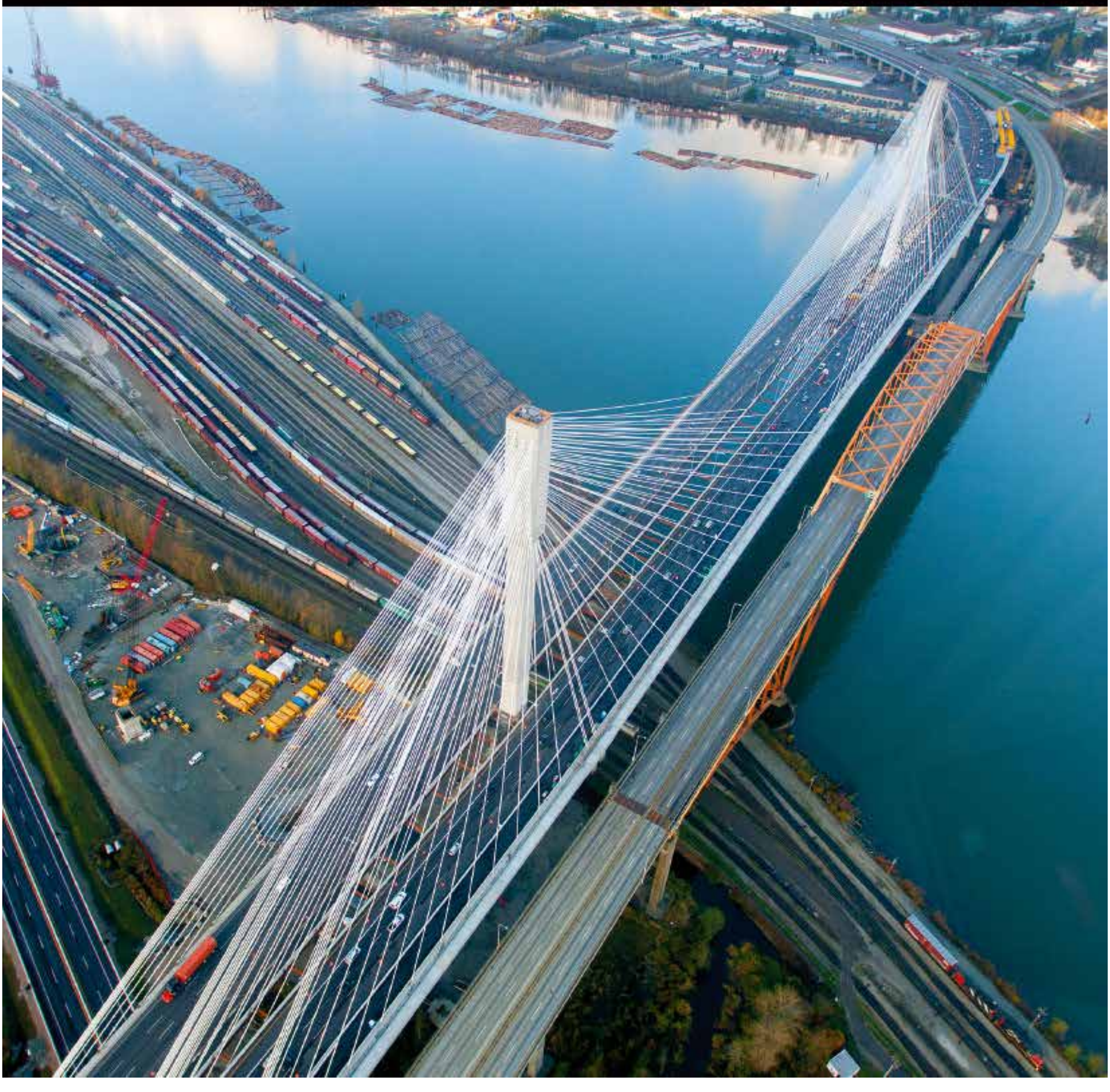
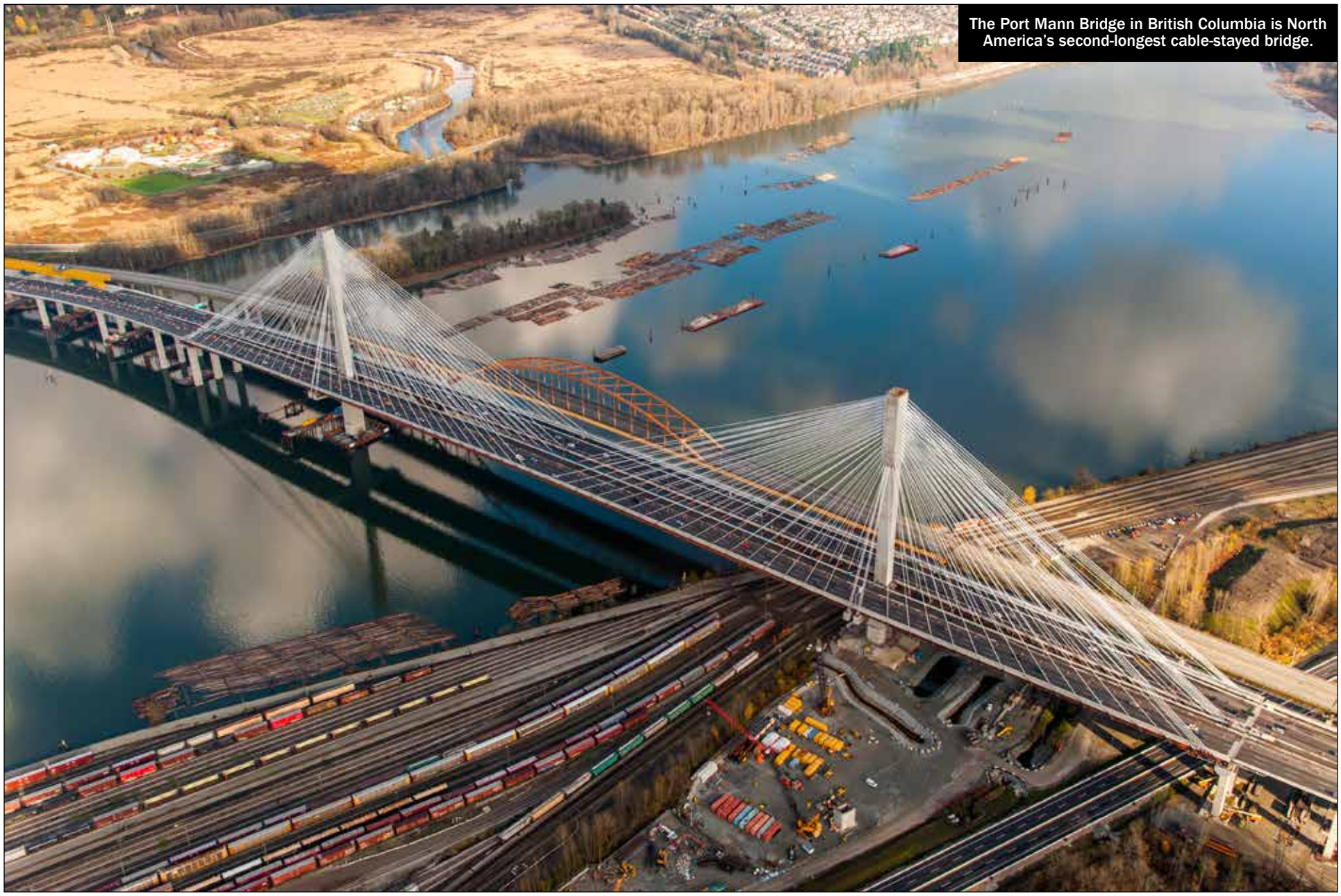
January 25, 2016 • Seattle Daily Journal of Commerce

# ACEC2016

## ENGINEERING EXCELLENCE AWARDS





The Port Mann Bridge in British Columbia is North America's second-longest cable-stayed bridge.

PHOTOS COURTESY OF T.Y. LIN INTERNATIONAL

## Structural systems

### National finalist: Platinum award

## T.Y. Lin International

**Project:** Port Mann Bridge/Highway 1
**Client:** Transportation Investment Corp.

T.Y. Lin International was the chief design engineer and project design manager for the Port Mann Bridge replacement in British Columbia.

The project involved construction of a new cable-stayed bridge and improvements to Highway 1. It is the largest transportation infrastructure project in the province's history.

T.Y. Lin International worked closely with the contractor, Kiewit-Flatiron Partnership, and the project owner, Transportation Investment Corp., to build the new bridge.

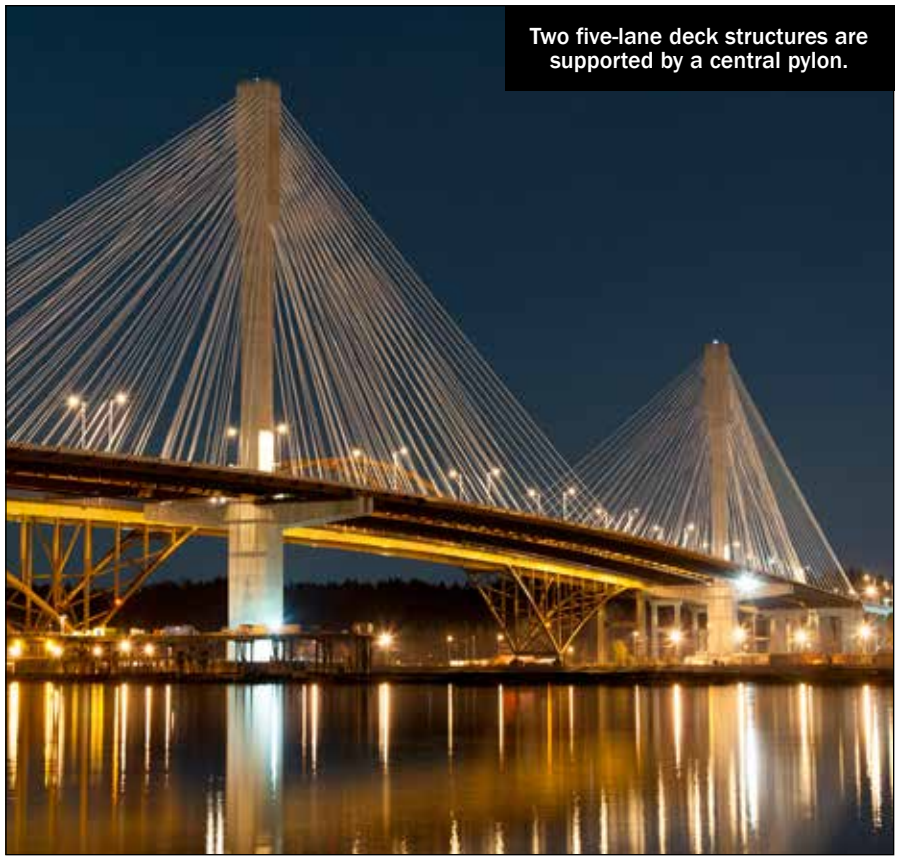
The Port Mann Bridge replaces an older, inefficient structure. The design-build project includes the 10-lane, 2,789-foot-long bridge crossing the Fraser River, plus a 1,148-foot-long south approach and a 2,690-foot-long north approach. Its 1,542-foot-long main span, 623-foot-long side spans, and 171-foot-wide deck make the bridge the largest main span crossing in Western Canada, North America's second-longest cable-stayed bridge, and one of the world's widest bridges.

The bridge has two separate five-lane deck structures supported by a single central pylon, and the twin decks are separated by a 33-foot median where two distinctive, 535-foot-high single-mast concrete towers as well as the central pylons are located. This superstructure supports 10 lanes instead of the five lanes originally envisioned. There also is a barrier-separated, 10-foot-wide bicycle/pedestrian path on the east flank.

The Port Mann Bridge opened in two phases. Phase 1 included eight traffic lanes and opened a year earlier than planned. Phase 2 opened the final two lanes and the multi-use path. The project was completed on time and on budget in August 2015.

The Port Mann Bridge now helps reduce travel time for drivers by as much as 50 percent, or up to one hour of drive time each day. The value of the anticipated travel time and operating cost savings is estimated to have a present value of more than $5 billion Canadian over a 35-year operating period. The bridge also introduces new transportation alternatives, including transit, cycling and walking.

Greg Johnson of owner Transportation Investment Corp. commended T.Y. Lin International "for their outstanding work on the seismically resilient, visually stunning bridge ... The success of this project was made possible in large part by the intensive, positive coordination and collaboration that took place throughout the life of the project."



Two five-lane deck structures are supported by a central pylon.

# T.Y. LIN WINS PLATINUM FOR PORT MANN BRIDGE

T.Y. Lin International won top honors in Washington's 49th annual Engineering Excellence Awards on Jan. 22 for its design and project leadership role in the construction of the Port Mann Bridge near Vancouver, British Columbia.

The awards are sponsored by the Washington state chapter of the American Council of Engineering Companies.

This year, ACEC Washington honored 42 projects representing a wide range of engineering achievements and demonstrating the highest degree of skill and ingenuity.

The top five award winners — one platinum and four gold — will go on to compete in the ACEC national competition in Washington, D.C., in April.

Members of the three-judge panel were Walter Schacht, principal of Schacht Aslani Architects; Linea Laird, chief engineer at the Washington State Department of Transportation; and Steve Johnston, engineer emeritus.

The American Council of Engineering Companies of Washington is a professional trade association representing consulting engineering, land surveying and affiliated scientific and planning firms statewide.

## ON THE COVER

The Port Mann Bridge is a 10-lane cable-stayed bridge over the Fraser River near Vancouver, British Columbia. T.Y. Lin International won ACEC Washington's platinum award for its work as the lead design engineer and project design manager.

PHOTO COURTESY OF TRANSPORTATION INVESTMENT CORP.

## DJC TEAM

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WEB DESIGN: LISA LANNIGAN • ADVERTISING: MATT BROWN

# NATIONAL FINALISTS

## PLATINUM AWARD

### STRUCTURAL SYSTEMS

**T.Y. LIN INTERNATIONAL**
**Project:** Port Mann Bridge/Highway 1
**Client:** Transportation Investment Corp.

## GOLD AWARDS

### ENERGY

**DLR GROUP**
**Project:** NRG Stadium solar
**Client:** NRG Solar SC Stadium LLC

### STRUCTURAL SYSTEMS

**HNTB**
**Project:** Tilikum Crossing
**Client:** Tri-County Metropolitan Transportation District of Oregon

### WASTE AND STORMWATER

**PARAMETRIX**
**Project:** Manchester Stormwater Park
**Client:** Kitsap County

### WATER RESOURCES

**PARAMETRIX**
**Project:** Calistoga Setback Levee
**Client:** City of Orting

# BEST IN STATE

## GOLD AWARDS

### UNIQUE OR INNOVATIVE APPLICATIONS

**DCI ENGINEERS**
**Project:** 47 + 7
**Client:** Sustainable Living Innovations

### FUTURE VALUE TO ENGINEERING PROFESSION

**GEOENGINEERS**
**Project:** Kentch Reach habitat restoration and floodplain reconnection
**Client:** Confederated Tribes of the Umatilla Indian Reservation

### SUCCESSFUL FULFILLMENT OF CLIENT/OWNER NEEDS

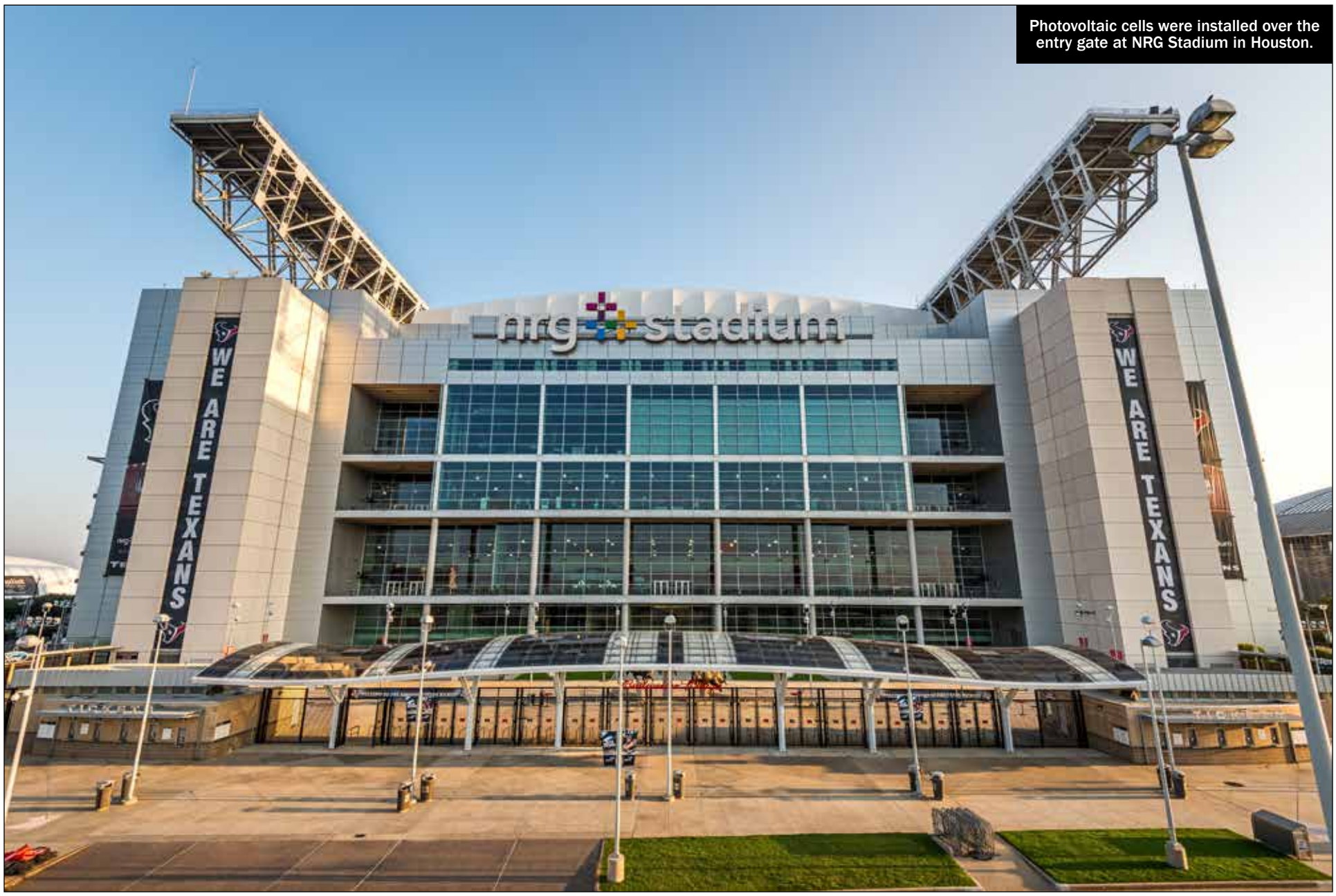
**OSBORN CONSULTING**
**Project:** Venema natural drainage system
**Client:** Seattle Public Utilities

### SOCIAL, ECONOMIC AND SUSTAINABLE DESIGN

**OTAK**
**Project:** Overlake Village south detention vault — integrated facilities
**Client:** City of Redmond

### COMPLEXITY/SPECIAL JUDGES' AWARD

**KPFF CONSULTING ENGINEERS**
**Project:** UW Montlake Triangle and Rainier Vista
**Client:** University of Washington




Photovoltaic cells were installed over the entry gate at NRG Stadium in Houston.

PHOTOS COURTESY OF DLR GROUP

# Energy

## National finalist: Gold award

## DLR Group

**Project:** NRG Stadium solar
**Client:** NRG Solar SC Stadium LLC

DLR Group was awarded a gold award for its creative design and installation of a new solar energy system at NRG Stadium in Houston.

The project involved the installation of 600 solar panels spread across the stadium for a total system size of 180 kilowatts, but in the process DLR also wanted to fulfill NRG Energy's mission to "ask people to think differently about energy."

NRG Stadium, built in 2002 to host the National Football League's Houston Texans, was the first NFL stadium to have a retractable roof. The stadium accommodates more than 71,000 fans and also hosts NCAA men's basketball tournaments, international soccer tournaments and big-name concerts. It will host the Super Bowl in 2017.

DLR's design called for something different from just a bunch of photovoltaic cells on the roof of the stadium. Innovative solar canopies were developed over two pedestrian bridges, the stadium entrance gate, and over an electric car-charging station in the parking lot.

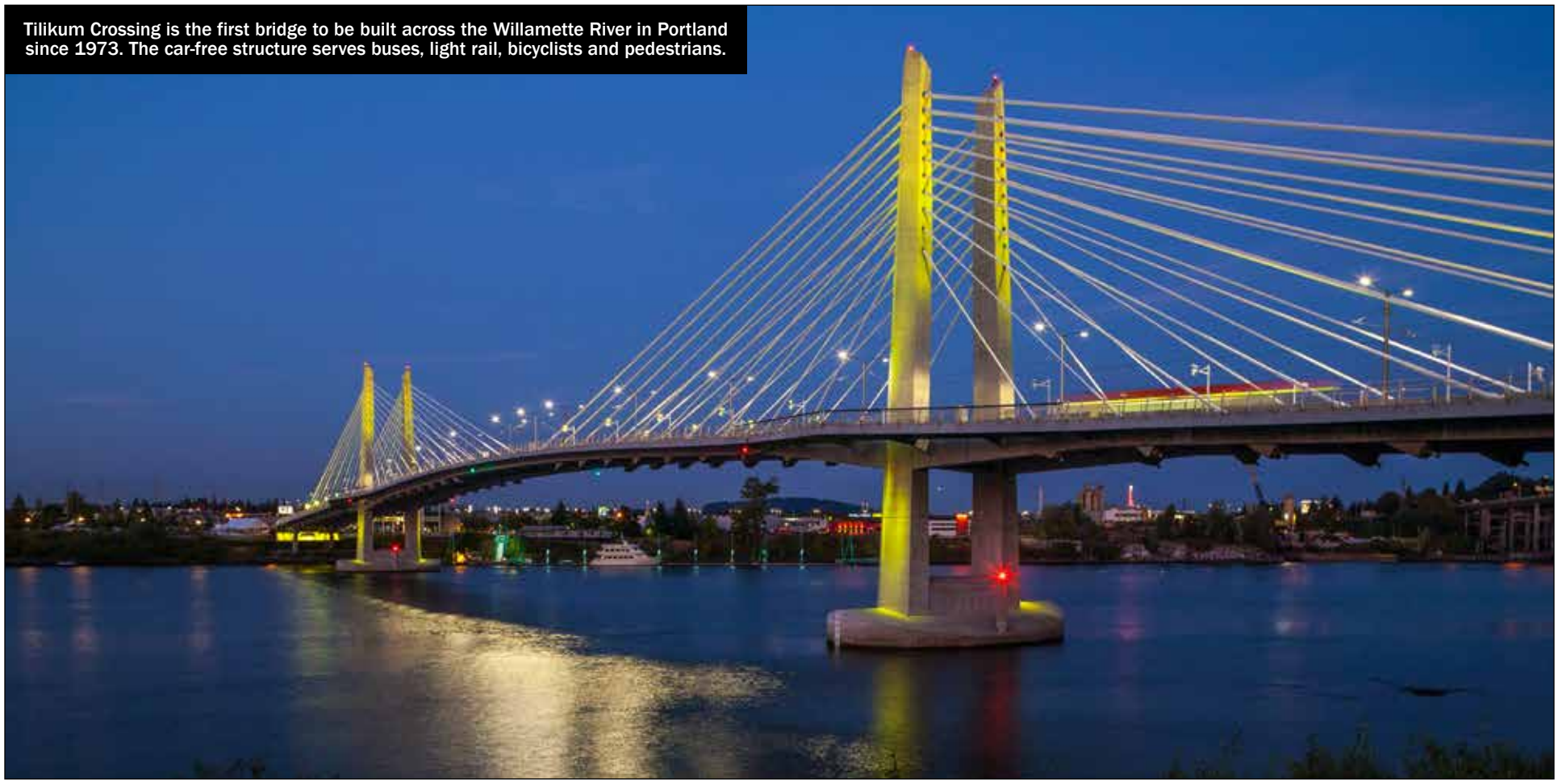
DLR designed a 200-foot-long weatherproof entry canopy with an hourglass shape.

The weatherproof entry canopy at the stadium entrance uses rolled HSS purlins that are seamlessly welded to create 200-foot-long undulating ribbons that splay along a girder to create an hourglass shape. The original pedestrian bridges were steel truss arch bridges that spanned the main road in front of the stadium.

DLR installed what it called "stealth wings" on each end of the bridges — canopies that dipped down before curving back up to cantilever out in a sweeping flare utilizing wide steel flange beams. The sustainable solar panels were installed on top of the canopies with the addition of multicolored LED lights in the shape of the Texans' logo.

The canopy over the car-charging lot was originally supposed to be two large rectangular pieces, but DLR instead created a plate column-girder angled 30 degrees from vertical so that the canopy appears to float over the parking stalls.

The new solar canopies are not only cool for the fans attending games, they show how solar power has the potential to be intrinsically involved in people's lives.



Tilikum Crossing is the first bridge to be built across the Willamette River in Portland since 1973. The car-free structure serves buses, light rail, bicyclists and pedestrians.

PHOTO COURTESY OF HNTB

# Structural systems

## National finalist: Gold award

## HNTB

**Project:** Tilikum Crossing
**Client:** Tri-County Metropolitan Transportation District of Oregon

Tilikum Crossing, also known as Bridge of the People, is one of a dozen bridges in Portland that spans the Willamette River. But it is the first-of-its-kind, long-span, automobile-free bridge designed specifically for pedestrian and bicycle traffic, buses and light rail, with streetcar use planned for the future.

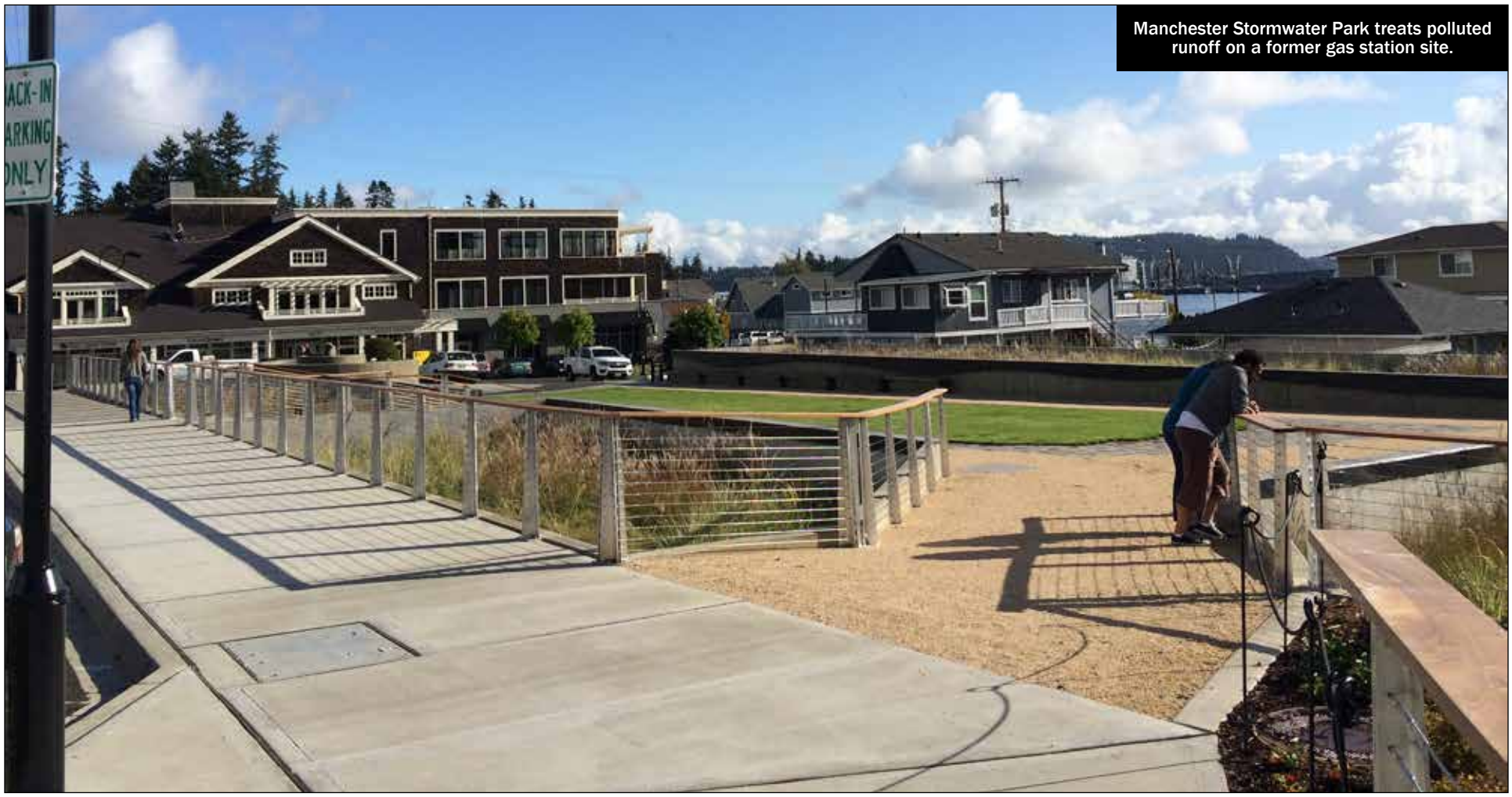
HNTB served multiple roles in the design and construction of this bridge, including developing concepts for bridge types; completing engineering feasibility analyses, cost estimates and risk assessments; and assisting the Tri-County Metropolitan Transportation District (Tri-Met) with evaluating and screening bridge types.

The firm also was responsible for complex foundation design, analysis of seismic hazards and liquefaction, and in-river explorations and in-situ testing.

Tilikum Crossing is composed of a 780-foot main span and two 390-foot end spans built by the segmental concrete cantilever construction method. Segments are 75 feet wide and 35 feet long. The bridge tower height was limited to 100 feet above the deck, necessitating the use of solid towers with a saddle system rather than conventional hollow-core towers of much bigger size. Fourteen-foot bike-pedestrian paths border each side of the bridge, flaring out into belvederes at the towers to allow people to stop and enjoy the bridge's panoramic views.

Tilikum Crossing is the first bridge in the United States to use commercially available multi-tube saddle design, which allows each cable to run continuously from the deck through the top of the tower and back down to the other side of the deck. An aesthetic lighting system uses 178 LEDs to illuminate the cables, towers and underside of the deck, with colors and motion of the lighting changing along with the river's speed, height and water temperature.

Completed on time and $15 million below the engineer's estimate, Tilikum Crossing fulfilled Tri-Met's desire that it be a "beautiful, affordable and constructible bridge" that would enhance transportation in the metropolitan area and ensure Portland would be recognized around the world.




Manchester Stormwater Park treats polluted runoff on a former gas station site.

PHOTO COURTESY OF PARAMETRIX

## Waste and stormwater

National finalist: Gold award

### Parametrix

**Project:** Manchester Stormwater Park
**Client:** Kitsap County

When Parametrix was hired to replace an aging and undersized stormwater outfall pipe on the beach at Pomeroy Park in Manchester, Kitsap County, it didn't seem like it would be remarkable feat.

But Kitsap County saw an opportunity not only to repair something old, but to make the solution even more creative and useful. With Parametrix's engineering expertise, the county built the brand new Manchester Stormwater Park, which not only cleans up polluted stormwater in an environmentally friendly way, but also mitigates what has been devastating flooding in the area.

Manchester Stormwater Park is the first of its kind in the Puget Sound area, and one of only a few such combined treatment/recreation parks in the nation. The project site was once an abandoned brownfield — a former gas station — but through smart new engineering ideas and techniques, it now collects runoff from up to 100 acres of developed land, treats it using soil and plants, and discharges it gently and evenly onto the beach and back into Puget Sound.

A primary design feature of the new park is a spiral rain garden made of bioretention soil mix and plants that intercepts low flows from groundwater and light storms, then distributes the water via valves to alternating zones of the rain garden for treatment. Because the rain garden intercepts the low flows, the life of the more expensive engineered treatment media in the treatment cells will be extended and required maintenance reduced.

The new stormwater system is designed to treat flow magnitudes exceeding 2,000 gallons per minute, removing more than 90 percent of pollutants. An estimated 100,000 pounds of contaminated suspended solids will be cleansed from the upstream stormwater runoff over the next 10 to 20 years. The new park now creates a physical and aesthetic connection between the Manchester Community Center and Pomeroy Park at the community's waterfront, serving as a setting for concerts, farmers markets, outdoor movies and Manchester Days celebrations.

Andrew Nelson, Kitsap County's Public Works director, wrote that "Parametrix embraced the innovative nature of the stormwater park concept and was able to come up with numerous features such as the 'spiral rain garden' that enhanced the functionality of the facility and also added to the aesthetic appeal and community acceptance."

Parametrix helped develop a 1.6-mile-long setback levee for the city of Orting.

PHOTO COURTESY OF PARAMETRIX

# Water resources

## National finalist: Gold award

## Parametrix

**Project:** Calistoga Setback Levee
**Client:** City of Orting

The city of Orting had suffered terrible flooding over the years, including seven federally declared flooding disasters since 1990.

The Pierce County city is nestled in the foothills of Mount Rainier between the Puyallup and Carbon rivers. Although levees had been built in the 1930s and 1950s along both rivers to protect the city, the levee on the Puyallup River was not FEMA-certified and provided minimal protection during high-water events.

As Orting's on-call engineering firm for over 30 years, Parametrix was brought in to help develop a long-term solution. That solution: Build a 1.6-mile-long setback levee that would protect the city and reconnect 46 acres of floodplains and 55 acres of backwater/streambeds to the middle Puyallup River main stem, restoring salmon habitat for three Endangered Species Act-listed species.

But how does a small city like Orting — with a population of 7,200 and a $2.5 million annual budget — generate funds to pay for this $19 million project?

The city and Parametrix doggedly pursued funding from half a dozen different agencies. One federal agency finally agreed to participate: the U.S. Department of Agriculture Office of Rural Development.

The city of Orting and Parametrix worked hard to develop trust between the city and all stakeholders and agencies. The Puyallup Tribe was a huge supporter through this entire project.

The new Calistoga Setback Levee was built between March and October of 2014. A sediment transport study had been completed during the planning stages to project where the bottom of the river would be in 15 to 30 years in order to determine how high the levee needed to be. The new levee was built to projected 2026 levels with an additional three feet of protection.

The wider channel would provide the area needed for the river to spread out while lessening the flooding impacts and damage to downstream cities that also were severely impacted during previous floods. The project reconnected the 46 acres of floodplains to the Puyallup River, restoring natural riverine processes and creating off-channel habitats for salmon. Another 55 acres of side stream habitat were reconnected through a series of fish-passable culverts and log structures.

The project also has added four more public shoreline access points and 1.6 miles of trails atop the levee connecting to the regional trail system via city sidewalks.

Once the levee is certified by FEMA, approximately 1,100 homes will potentially be removed from the 100-year floodplain, lifting the requirement that homeowners carry flood insurance. These factors have a direct impact to the local economy of between $1 million and $1.5 million.

The new levee was substantially completed one month before the fourth-highest flow since 1962 came down the Puyallup River in November 2014. Not a single sandbag had to be filled and no evacuations were required. In fact, the city did not suffer any flooding.

Orting Mayor Joachim Pestinger said, "Parametrix was right there, side by side with city staff, anxiously awaiting the outcome. The levee passed with flying colors."

## Unique or innovative applications

### Best in state: Gold award

## DCI Engineers

**Project:** 47 + 7
**Client:** Sustainable Living Innovations

The challenge was to build a six-story multifamily apartment structure on a tiny urban site in the already dense University District in Seattle. It had to be built quickly and cost-efficiently, with green features and great livability.

DCI Engineers partnered with Sustainable Living Innovations to make it happen. The project, called 47 + 7, is the first high-tech building of its kind on the market.

It's constructed from SLI's proprietary panelized construction technology, consisting of prefabricated "sandwiched" panelized wall and floor systems, and containing all plumbing, electrical, fire sprinklers and finishes. In addition, a "kit of parts" shipped from an off-site manufacturer to the job site allows easy assembly of the structural connections — similar to an erector set.

Building on such a small urban site would usually be deemed cost-prohibitive when applying traditional linear construction practices. SLI wanted to integrate a streamlined way of building quality housing resembling a simplified assembly process. They also wanted column-free interior spaces so the apartments appear much larger.

DCI designed the bolting details for connecting 47 + 7's steel "exoskeleton" framing structure, making the building economically viable and easily constructible without the need for time-consuming field welding activity.

DCI also ensured the integrity of the steel framing system, demising walls, concrete/metal decks, thermal breaks, building envelope and anchoring of rooftop solar panels. The structural design allows 9-foot-high ceilings in the units, optimizing the interior space for abundant natural light and a sense of openness.

As a result of these innovations, 47 + 7 is a highly sustainable and sleek modern building that does not appear manufactured like portable model housing. It is made primarily of concrete, steel and glass, and no drywall systems were installed. There is hydronic radiant heat flooring and insulated walls.

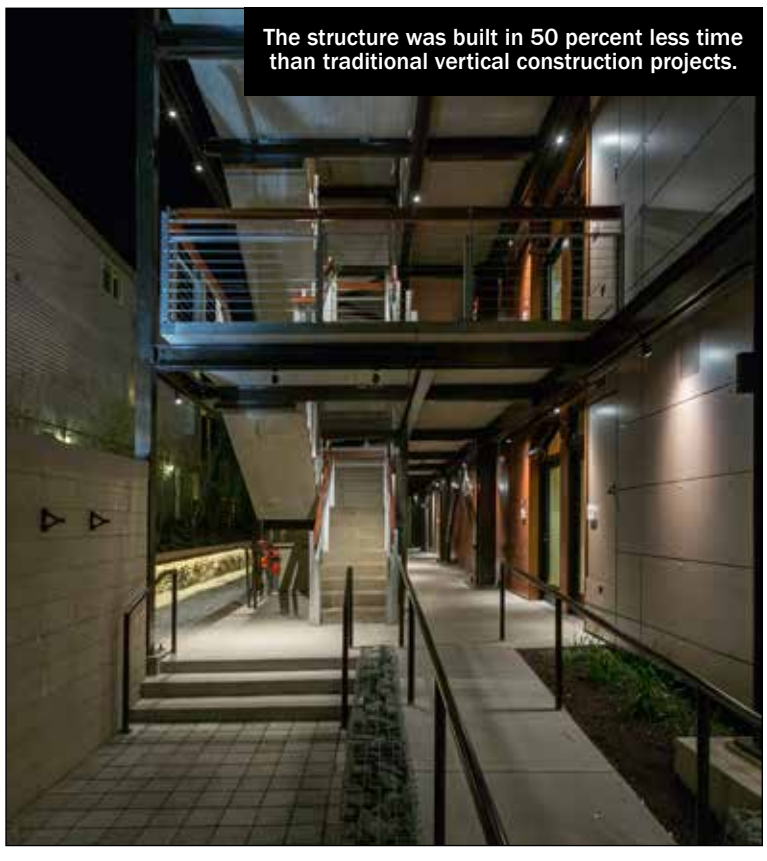
The building has 24 total units, with four living units per floor. It was built in 50 percent less time than traditional vertical construction projects.

DCI's role in the 47 + 7 project helped SLI fulfill the city of Seattle's expectations for affordable vertical housing, including transparency (floor-to-ceiling windows), natural light, fenestration (window arrangements), and modularization (variated, subdivided building facades that differentiate from flat, monolithic wall designs).

"DCI brought a holistic involvement to the business partnership," said Rick Osterhout, executive vice president of SLI. "Long-term collaboration between the two firms was evident throughout the proof-of-concept to final design phases of the project."

DCI Engineers performed structural design work for 47 + 7, a modular apartment project in Seattle's University District.

PHOTOS COURTESY OF DCI ENGINEERS



The structure was built in 50 percent less time than traditional vertical construction projects.

## National Silver Awards

### Small Projects

**ARUP**
**Projection:** Impatient Optimist
**Client:** Bill & Melinda Gates Foundation

### Structural Systems

**CARY KOPCZYNSKI & CO.**
**Project:** Premiere on Pine
**Client:** Holland Partner Group

### Structural Systems

**COUGHLIN PORTER LUNDEEN AND GEOENGINEERS**
**Project:** Allen Institute for Brain Science
**Client:** Perkins+Will

### Energy

**DLR GROUP**
**Project:** MGM Mandalay Bay solar design
**Client:** NRG Renew

### Environmental

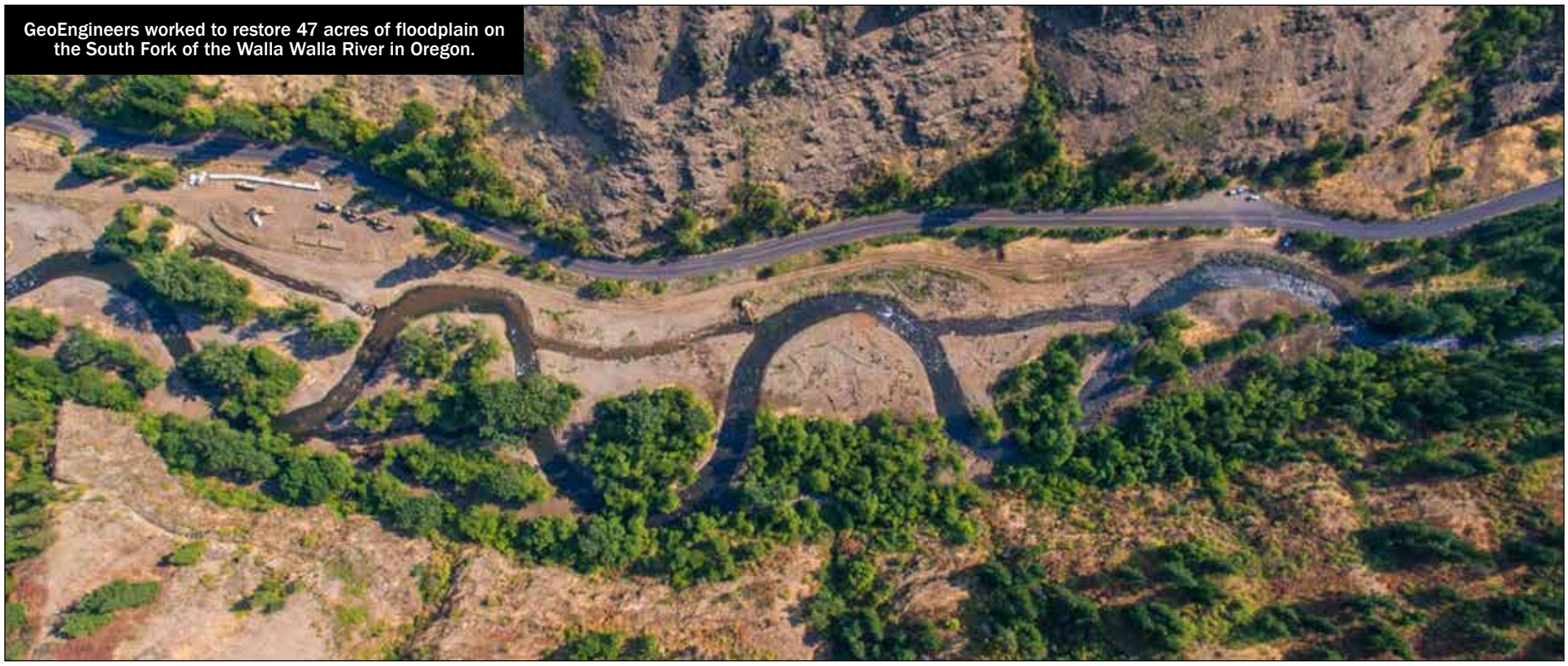
**HANSON PROFESSIONAL SERVICES**
**Project:** Nason Creek habitat restoration
**Client:** Chelan County Natural Resources Department

### Special Projects

**HNTB**
**Project:** Mercer Corridor improvements
**Client:** Seattle Department of Transportation

### Studies, Research and Consulting

**NORTH CORRIDOR TRANSIT PARTNERS (A JOINT VENTURE OF PARAMETRIX AND PARSONS BRINCKERHOFF)**
**Project:** Lynnwood Link Extension
**Client:** Sound Transit



GeoEngineers worked to restore 47 acres of floodplain on the South Fork of the Walla Walla River in Oregon.

PHOTO COURTESY OF GEOENGINEERS

# Future value to engineering profession

## Best in state: Gold award

## GeoEngineers

**Project:** Kentch Reach habitat restoration and floodplain reconnection

**Client:** Confederated Tribes of the Umatilla Indian Reservation

In the late 19th and early 20th centuries, logging and agricultural practices along the Kentch Reach on the South Fork of the Walla Walla River virtually eliminated native fish spawning and juvenile rearing habitat for more than 100 years.

The Confederated Tribes of the Umatilla Indian Reservation purchased the site in 2003 to restore fish and wildlife habitat. The tribe's vision was to allow the river to once again meander back and forth across its original floodplain.

To realize this dream, the project team needed to focus not just on building habitat, but also on rebuilding the river's original physical processes.

But with no historical reference point to draw on, the team used cutting-edge analytical and quantitative methods to reimagine the intricate processes that existed before humans intervened. The team predicted natural conditions at the reach using several methods that quantified discharge, slope, width, depth, panform, bed-material size and riparian conditions.

A GeoEngineers-developed software tool call HOME (Habitat Optimization Modeling of Ecosystems) combined hydraulic modeling and quantitative habitat data to visualize how individual restoration features influence habitat improvements. This software helped visualize how habitat conditions would change for specific species, life history stages and seasonal flows.

Projects of this type do not commonly include groundwater studies, but the scale of this restoration required extensive revegetation along the new alignment, and there was concern that the record dry conditions would limit plant growth. So GeoEngineers conducted a groundwater study to determine planting depths required to reach the water table, plus to estimate hyporheic (mix of shallow groundwater and surface water) interactions. Thanks to this additional step, nearly 100 percent of the new plantings survived.

Traditional restoration approaches lock the channel in place and create static environments that need to be maintained when the river adjusts to changing conditions. GeoEngineers' design allows the river to respond and adjust to events such as flood and debris accumulation in a manner that shapes and maintains improved habitat conditions over the long term.

The project reclaimed and restored 47 acres of floodplain, increased the channel length from about 3,500 feet to 4,300 feet, increased side channel length from about 160 feet to 3,500 feet, and roughly doubled available habitat. It also protected a critical hatchery program during construction by limiting turbidity, matching construction with the fish-treatment schedule and designing a silt fence at the hatchery intake.

Mike Lambert, project manager from the tribes, wrote to GeoEngineers: "Given the sediment concerns, risks endured at the hatchery facility, concerns of impacts to irrigators, ... and all the project logistics including budget, contracting needs and changes, design addenda, sediment control planning, construction oversight and management, you completed the Kentch Project in a technically sound manner and on schedule."

# Successful fulfillment of client/owner needs

## Best in state: Gold award

## Osborn Consulting

**Project:** Venema natural drainage systems
**Client:** Seattle Public Utilities

Osborn Consulting worked with Seattle Public Utilities to design a new drainage system for this North Seattle street. The photo shows the street before the improvements.

PHOTO COURTESY OF OSBORN CONSULTING

Osborn Consulting, Inc. was selected in 2013 by Seattle Public Utilities to help design the Venema Creek natural drainage system in Seattle's Broadview neighborhood.

Prior to the project, polluted runoff during wet weather was released into Venema Creek at the top of an 80-foot sand cliff feeding into the fish-bearing Piper's Creek.

Seattle Public Utilities determined the best approach to improve stream habitat was to mimic natural stream hydrology by installing a combination of bioretention cells and underground injection control wells. Multiple technologies were combined in this project to try to restore the hydrology of the creek back to its natural state.

As prime consultant, OCI collaborated with SPU engineers to design a new roadway, conveyance system and green stormwater infrastructure across 60 feet of right of way for five residential city blocks.

The new system conveys stormwater runoff from about 80 acres to a cascading system of bioretention cells located in the right of way. There, the water is cleaned and treated before being collected by underdrains and routed to one of three underground injection control wells.

Treated runoff is infiltrated approximately 80 feet deep to a point below the impermeable glacial till and into the permeable glacial outwash. The infiltrated and cleansed runoff then gradually moves laterally through the glacial outwash to support year-round base flows for Venema Creek.

SPU engineers worked alongside the OCI team to collaboratively design the project, which allowed SPU engineers to be mentored in using new roadway design tools. OCI also worked closely with the city's maintenance department, which resulted in assured accessibility to the bioretention cells and the underground injection control wells for cleaning and minimizing fine sediment leaking into the underdrain system.

The project created right-of-way improvements that provide a safer environment for residents as well as more attractive streets. The combined effect of traffic calming with narrower streets, new sidewalks and ADA-compliant ramps has improved pedestrian safety along these rights of way. Trees and plants that are a part of the natural system design and inherent in the design of bioretention cells help to improve the aesthetics of the corridor as well.

"The team was very responsive to our needs and was helpful in maintaining a positive and respectful relationship with the neighbors surrounding the project area," according to Masako Lo, senior civil engineer for SPU.

"This project was a successful example of a collaborative effort between SPU and consultants to meet the project goals of improving Broadview's drainage, protecting the health of Venema Creek, and providing street right-of-way improvements."

# Social, economic and sustainable design

## Best in state: Gold award

## Otak

**Project:** Overlake Village south detention vault — integrated facilities
**Client:** City of Redmond

The Overlake Village neighborhood in Redmond is projected to grow into the central Puget Sound region's next urban center.

Overlake Village will include a mix of commercial, retail and residential uses. An East Link light rail station is slated to open there in 2023.

In the past, the area was developed at a lower density but with a high percentage of impervious surface area and little to no stormwater flow control or water quality treatment. In 2010, Otak completed a study for the city of Redmond laying out a plan to provide stormwater infrastructure to support the city's new vision for development.

Two years later, Otak was hired by the city to help with the development of the Overlake Village regional stormwater facilities plan, which presented in greater detail the flow control, runoff treatment and conveyance facilities needed to support full redevelopment of Overlake Village.

Otak developed a strategic implementation plan to balance the interconnected low-impact development elements, regional facilities, and parks and open spaces. This approach allowed the most cost-effective means of providing stormwater management.

An overarching objective was to provide the maximum benefit to the environment while also supporting a vibrant urban center.

Otak was also the prime consultant for the preparation of construction documents for the first two of three regional facilities proposed in the 2012 regional plan. One of these facilities, the station infiltration facility, is a 4.4-acre-foot infiltration facility that will be located beneath the access road at the future light rail station.

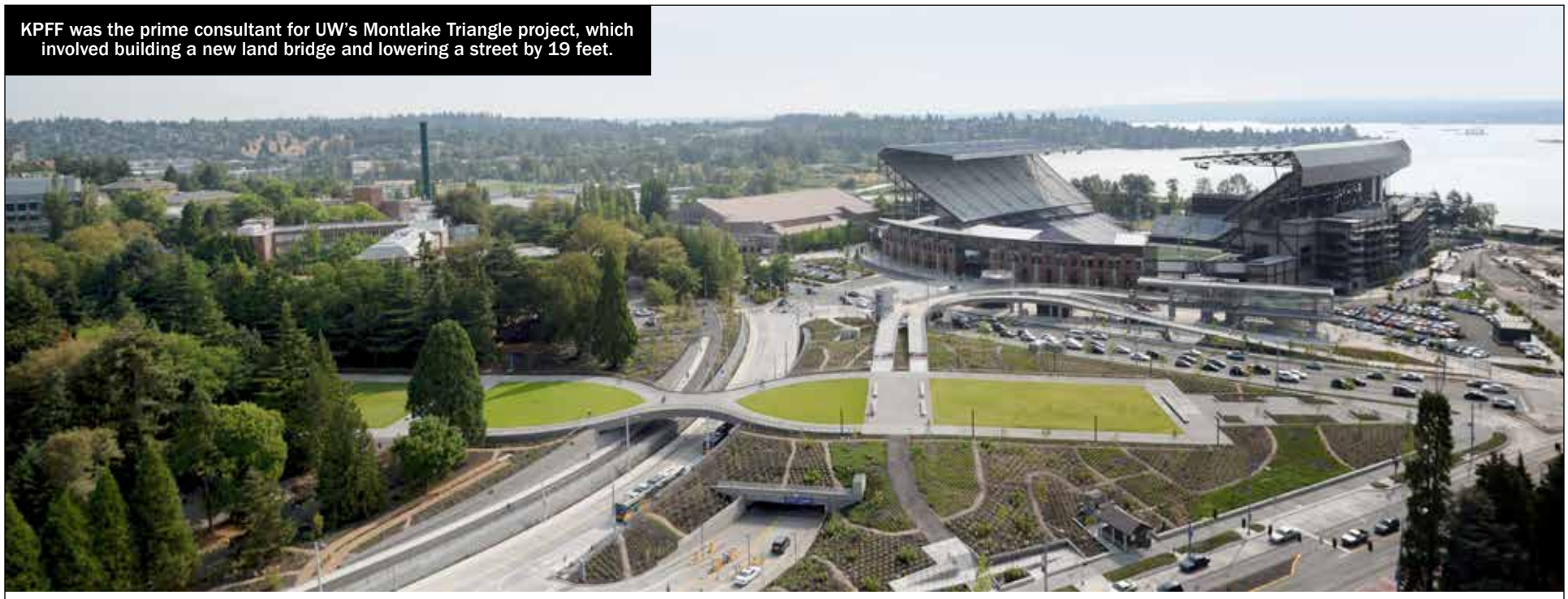
The second facility, the south detention vault, is a 20-acre-foot detention facility located at the downstream end of the watershed underneath the Sears parking lot, which will be converted to a city park as the village redevelops. Construction of this facility was completed last summer, and Otak, along with the city of Redmond staff, provided construction management services.

This project successfully constructed the largest stormwater detention vault in Washington within a highly urbanized neighborhood, requiring deep excavation near busy roadways and adjacent businesses. This regional stormwater facility has stimulated economic growth in the Overlake Village area with several redevelopment master plans being submitted before the final construction was completed.

The project shows how careful planning can create a win-win situation for developers, who can now maximize their site development potential and be assured that the stormwater from their sites is properly managed, and for the city, which wanted maximum environmental enhancement, economic growth and open space in an area that lacked all three.

Otak provided construction management services for this stormwater detention vault in Redmond's Overlake Village neighborhood.

PHOTO COURTESY OF OTAK



KPFF was the prime consultant for UW's Montlake Triangle project, which involved building a new land bridge and lowering a street by 19 feet.

PHOTO COURTESY OF KPFF CONSULTING ENGINEERS

# Complexity

## Best in state: Gold award/Special judges award

### KPFF Consulting Engineers

**Project:** UW Montlake Triangle and Rainier Vista
**Client:** University of Washington

The Montlake Triangle area is one of the more congested multi-modal zones in the Puget Sound region — it's the confluence of two arterials, a regional bike/hiking trail, and a destination hub to the University of Washington, Husky Stadium and the UW Medical Center.

The area experienced frequent accidents and near misses because the trail carrying more than 1,200 people per hour was too narrow, the intersecting points confusing and the road crossings hazardous. The UW Montlake Triangle and Rainier Vista Project created a seamless grade-separated multi-modal transportation hub while transforming the main gateway to the University of Washington.

KPFF provided a leading role in all aspects of the project, from planning and design through implementation.

KPFF overcame significant challenges, including:

• Restoring the historic view corridor to Mount Rainier, which required 19,000 cubic yards of fill to be added above a 30-year-old parking garage, with fill depths ranging from 18 inches to 10 feet.

• Achieving the signature hourglass shape of the land bridge, which required a 3-D post-tensioning system that included a novel crossing configuration of external ducts that minimized the bridge depth by reducing the concrete weight of the structure.

• Lowering a city street by 19 feet for the land bridge, which resulted in exposing one side of an existing underground parking garage, requiring seismic retrofits within the garage.

• Resolving complex geometric constraints to achieve safe, accessible and efficient pathways.

• Working with stakeholders to overcome significant budget-to-program challenges that did not detract from the overall goals.

The design for the lower Rainier Vista integrates the previously isolated ground of the Montlake Triangle by lowering Northeast Pacific Place, installing the land bridge, and completely revising the Triangle land form as an extension of the pedestrian mall. By claiming the Montlake Triangle as part of the Rainier Vista axis, UW returns to original intentions for the Triangle to act both as a terminus of the axis and a threshold into the university.

KPFF's urban design also called for demolition of an existing railroad bridge to make space for the new land bridge abutment, but KPFF avoided demolition of the bridge and saved costs by incorporating it into the soldier pile wall and using it to support excavation for the land bridge abutment. In addition to reducing demolition and soldier piles, this design allowed the bridge to be used as a temporary roadway for traffic that was diverted during the nearby roadway excavation.

John Palewicz, director of strategic projects at UW's Capital Projects Office, said, "As our prime consultant, KPFF worked with the university, our landscape design firm and four transit agencies to deliver a project that packed a lot of program into a tight budget…We believe KPFF exceeded our expectations by providing the leadership, creativity, teamwork and technical prowess we needed from them to deliver this complex and iconic project."

# BEST IN STATE

## SILVER AWARDS

### SOCIAL/ECONOMIC SUSTAINABILITY

**GOLDER ASSOCIATES**
**Project:** City of Yakima aquifer storage and recovery
**Client:** City of Yakima

**HERRERA ENVIRONMENTAL CONSULTANTS**
**Project:** Chambers Lake stormwater treatment wetlands
**Client:** City of Lacey

**LANDAU ASSOCIATES**
**Project:** Yahoo eco-friendly cooling system upgrades
**Client:** M.A. Mortenson Co.

### SUCCESSFUL FULFILLMENT OF CLIENT/OWNER NEEDS

**ANDERSON PERRY & ASSOCIATES**
**Project:** Snake River wastewater crossing
**Client:** Port of Walla Walla

**WOOD HARBINGER**
**Project:** Kirkland Justice Center
**Client:** City of Kirkland

### FUTURE VALUE TO ENGINEERING PROFESSION

**BERGERABAM**
**Project:** City of Yakima railroad grade separation
**Client:** City of Yakima

**FSI CONSULTING ENGINEERS**
**Project:** Fran's Chocolates production facility
**Client:** Fran's Chocolates

**NOTKIN MECHANICAL ENGINEERS**
**Project:** Ground source heat pumps and housing upgrades
**Client:** WA Patriot Construction

### COMPLEXITY

**JACOBS / HART CROWSER**
**Project:** State Route 167 Puyallup Bridge replacement
**Client:** Atkinson Construction

**MWH AMERICAS**
**Project:** Wanapum Dam spillway remediation project
**Client:** Public Utility District No. 2 of Grant County

**SHANNON & WILSON**
**Project:** State Route 520 pontoon casting facility
**Client:** Washington State Department of Transportation

### UNIQUE OR INNOVATIVE APPLICATIONS

**PARAMETRIX**
**Project:** Wastewater system improvements
**Client:** Nisqually Indian Tribe

# BEST IN STATE

## BRONZE AWARDS

**COUGHLIN PORTER LUNDEEN**
**Project:** Shorewood High School
**Client:** Bassetti Architects

**EXELTECH CONSULTING**
**Project:** Saltwater State Park Bridge rehabilitation
**Client:** City of Des Moines

**GEOENGINEERS**
**Project:** Dam safety monitoring system
**Client:** Portland General Electric

**KPFF CONSULTING ENGINEERS**
**Project:** Mercer Corridor — West Phase
**Client:** Seattle Department of Transportation

**NOTKIN MECHANICAL ENGINEERS**
**Project:** San Juan Museum of Art
**Client:** Richard Hobbs + Wagoner/Galloway Architects

**PERTEET**
**Project:** Park Lane pedestrian corridor enhancement project
**Client:** City of Kirkland

**REID MIDDLETON**
**Project:** Ivar's Pier 54 seismic upgrades and renovation
**Client:** Ivar's

**SKILLINGS CONNOLLY**
**Project**: 204th Street extension
**Client:** City of Lynnwood

**WELCH COMER & ASSOCIATES**
**Project:** Hawthorne Avenue, U.S. 395 to Walnut
**Client:** City of Colville

**WOOD HARBINGER**
**Project:** West Olympia Clinic Remodel
**Client:** TGB Architects

**WSP PARSONS BRINCKERHOFF**
**Project:** Northeast Fourth Street extension, 116th to 120th avenues
**Client:** City of Bellevue