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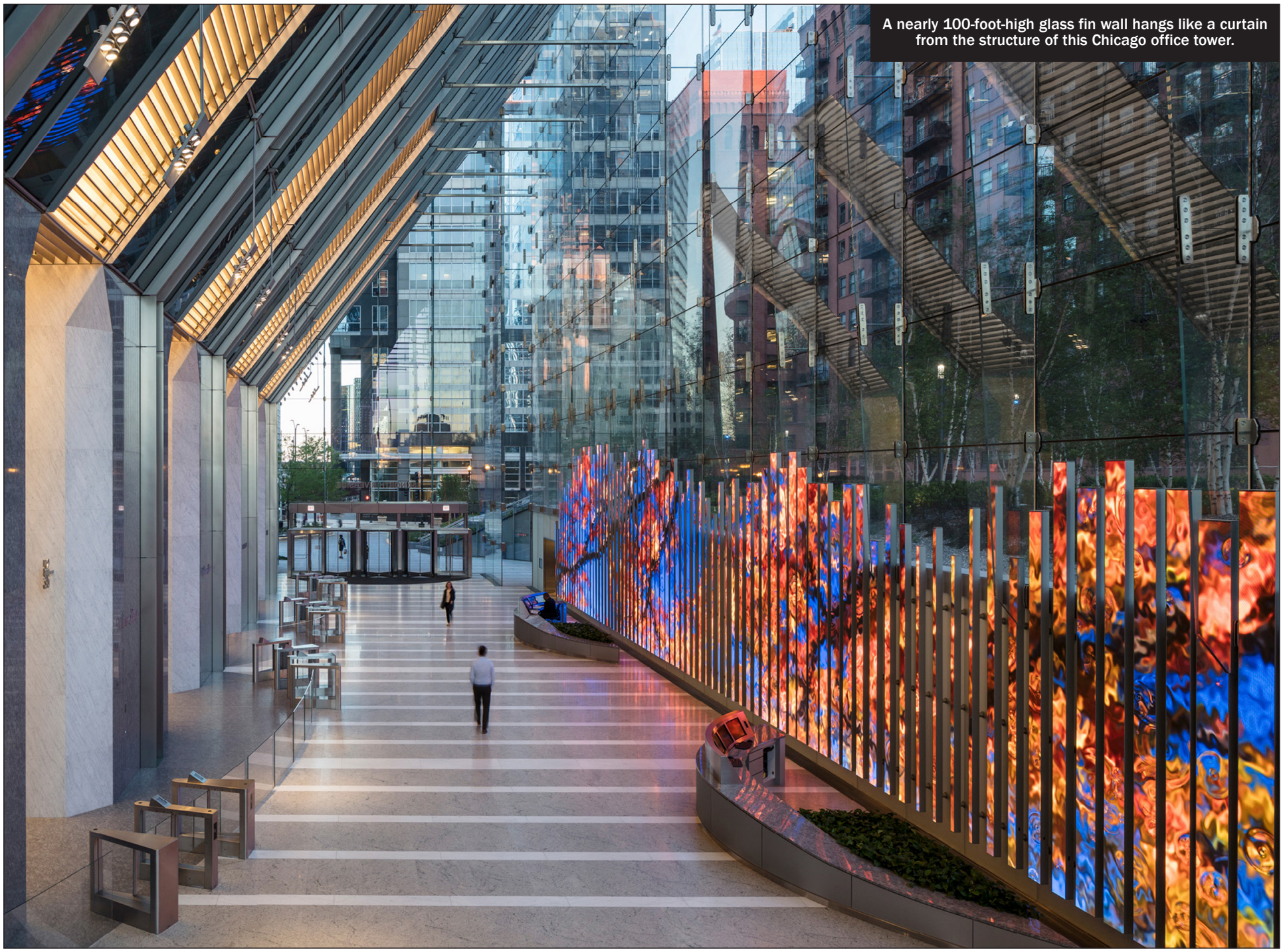
ACEC2018

ENGINEERING EXCELLENCE AWARDS



A nearly 100-foot-high glass fin wall hangs like a curtain from the structure of this Chicago office tower.

PHOTO PROVIDED BY MAGNUSSON KLEMENCIC ASSOCIATES

Structural Systems

National finalist: Platinum award

Magnusson Klemencic Associates

Project: 150 North Riverside
Client: Riverside Investment & Development Co., Goettsch Partners

The waterfront site that is now home to Chicago's newest 54-story high-rise was once considered so restraining that developers had avoided it for almost a century.

Compressed between the Chicago River to the east, seven active Amtrak rail lines to the west, and city bridge viaducts to the north and south, the site offered only 8,500 square feet of buildable area. Despite the property's drawbacks, Magnusson Klemencic Associates offered an innovative structural solution that maximized the tiny footprint while delivering not only a 1.25 million-square-foot office tower, but also a 1.5-acre outdoor public park and river walk for the owner, Riverside Investment & Development Co. Goettsch Partners was the architect.

The site's constraining features, further complicated by a 30-foot setback at the river for Chicago's Riverwalk, left only a sliver of land for the tower's base. MKA solved the problem by using a razor-thin concrete central building core structural system that allows the 750-tall tower to rise from a base that's just 39 feet wide.

To achieve this feat, MKA employed a number of technical innovations. For the tower support system, MKA created eight four-story, sloping steel-transfer systems to channel the loads from the tower above to its narrow base, and out of Amtak's air space. These form the building's distinctive tapered base and make way for the light-filled lobby.

The structure also used the largest rolled steel sections produced in the world, and steel that is 40 percent stronger than conventional steel shapes.

To deal with an unprecedented blade core height-to-width slenderness of over 19-to-1 (three times narrower than traditional building designs), MKA employed 12 water-filled tanks at the top of the building to minimize building motion under strong winds.

Holding 160,000 gallons of water, the wave action in the tanks not only calms the building during wind events, but also serves as city-approved fire protection storage tanks to help supply the building's sprinkler system. This dual-use is a first for the city of Chicago.

MKA developed a precast, prestressed concrete lid structure designed to conform to strict Amtrak requirements for train operations, and with no temporary construction shoring needed. Once completed, the lid was designed as a critical staging area for the contractor before its ultimate use as a park.

To support the building at its base and deal with the highly magnified loads caused by the narrow core, MKA designed 16 massive concrete caissons that were drilled 110 feet deep and socketed 6 feet into solid bedrock, literally anchoring the building to the earth to resist uplift. The caissons support a 10-foot-thick concrete foundation mat. This hybrid caisson/mat solution used half the number of support piles as a conventional building.

To support the lid structure and the precisely coordinated concrete crash walls at the track level, MKA designed high-capacity micropiles — one-third the diameter of traditional piles used in Chicago — creating the highest capacity-to-diameter ratio of any piling ever used in the city. More than 100 micropiles were strategically placed within Amtrak's infrastructure.

A nearly 100-foot-high glass fin wall — the tallest tension-only, glass fin wall in the world — hangs from the structure above like a curtain. MKA met all the challenges associated with deflection control, wind-load transfer and construction tolerances. The glass wall creates a light-filled lobby space and increases sunlight in the outdoor park.

MKA WINS PLATINUM FOR CHICAGO HIGH-RISE

For the second year in a row, Seattle's Magnusson Klemencic Associates received the top honor at the annual Engineering Excellence Awards. MKA took home the platinum award for its structural design of 150 North Riverside, a 54-story office tower in Chicago.

Sponsored by the Washington state chapter of the American Council of Engineering Companies, the awards program recognizes projects that represent a wide range of engineering achievements and demonstrate the highest degree of skill and ingenuity.

Thirty-two projects were honored in this year's program. All national-track finalists will go on to compete in the ACEC national competition in Washington, D.C., in April.

Entries were evaluated by a five-judge panel: Bob Axley, engineer emeritus at Wood Harbinger; Bill Bender, chair of the University of Washington Department of Construction Management; Amy Haugerud, consultant at RoseWater Advisors; Steve Johnston, engineer emeritus at Landau Associates; and Benjamin Minnick, construction editor at the Daily Journal of Commerce.

ACEC Washington is a professional trade association representing consulting engineering, land surveying and affiliated scientific and planning firms statewide.

ON THE COVER

Magnusson Klemencic Associates won ACEC Washington's platinum award for its structural design of 150 North Riverside, a 54-story office tower in Chicago. The structure sits on a base just 39 feet wide. PHOTO PROVIDED BY MAGNUSSON KLEMENCIC ASSOCIATES

DJC SPECIAL SECTION TEAM

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NATIONAL FINALISTS

PLATINUM AWARD

STRUCTURAL SYSTEMS

MAGNUSSON KLEMENCIC ASSOCIATES
Project: 150 North Riverside
Client: Riverside Investment & Development, Goettsch Partners

GOLD AWARDS

STRUCTURAL SYSTEMS

COWI NORTH AMERICA
Project: Abraham Lincoln Bridge
Client: Kentucky Transportation Cabinet, Jacobs Engineering Group

SPECIAL PROJECTS

HART CROWSER
Project: Governors Island Park and Public Space
Client: West 8 Urban & Landscape Architecture

SPECIAL PROJECTS

PARSONS
Project: Elliott Bay Seawall
Client: Seattle Department of Transportation

BEST IN STATE

GOLD AWARDS

SUCCESSFUL FULFILLMENT OF CLIENT/OWNER NEEDS

GEOENGINEERS
Project: Palermo data gaps and feasibility study
Client: Washington State Department of Transportation

UNIQUE OR INNOVATIVE APPLICATIONS

GOLDER ASSOCIATES
Project: Del Monte (Oahu Plantation) Superfund Site
Client: Del Monte Fresh Produce

SOCIAL, ECONOMIC AND SUSTAINABLE DESIGN

J-U-B ENGINEERS
Project: Pullman-Moscow Regional Airport mitigation
Client: Pullman-Moscow Regional Airport

FUTURE VALUE TO ENGINEERING PROFESSION

MIG | SVR
Project: Barton CSO control with green infrastructure
Client: King County Wastewater Treatment Division

COMPLEXITY

STANTEC
Project: Kadlec Regional Medical Center Utility Plant
Client: Kadlec Regional Medical Center, Davis Partnership

ENGINEER OF THE YEAR

JEFF PEACOCK
Parametrix

The Lincoln Bridge, which spans the Ohio River, is the first major cable-supported bridge for which the tower foundations are supported by a single line of large-diameter drilled shafts.

PHOTO PROVIDED BY COWI NORTH AMERICA

Structural Systems

National finalist: Gold award

COWI North America

Project: Abraham Lincoln Bridge
Client: Kentucky Transportation Cabinet, Jacobs Engineering Group

Varying geotechnical conditions at each end of this cable-stayed bridge brought unique challenges to the COWI team, which designed its foundation system.

The new six-lane, three-tower bridge is 2,100 feet long and spans the Ohio River between Louisville, Kentucky, and Jefferson, Indiana.

The successful completion of the span was the result of a collaborative effort among the owner, Kentucky Transportation Cabinet; Walsh Construction, the design-build contractor; Jacobs Engineering Group, the prime consultant; and COWI North America, the engineer of record.

The subsurface conditions at the site included highly variable depths to bedrock at each end of the bridge. This resulted in a stiffness contrast for the structure that required careful consideration of foundation axial capacity and lateral stiffness in order for the bridge to remain technically and economically feasible.

Drilled shafts support the bridge's three main towers and the two anchor piers. Each tower is supported by a single row of four, 12-foot-diameter drilled shafts socketed into limestone.

Use of this foundation system reduced the foundation installation time, accelerated the overall bridge construction schedule and resulted in a very flexible system. Additionally, it minimizes the dimension perpendicular to the river flow and maximizes the main span navigation clearances. As a result, environmental concerns are addressed by minimizing disturbance to river flow and the risk of debris accumulation.

The design method didn't come without its challenges, however. The single-row approach (the Abraham Lincoln Bridge was the first major cable-supported bridge where a single line of large-diameter drilled shafts was used for each tower foundation) resulted in high geotechnical and structural demands on the drilled shaft foundations, both under critical unbalanced loads during the erection of the superstructure and under governing live and wind loads.

Variable limestone depths on both the Kentucky and Indiana sides created severe foundation stiffness contrasts that affected the load transfer from the superstructure to the substructure and the location of the bearing fixity. The design team pushed the boundaries to address these technical challenges throughout the duration of the project.

The Abraham Lincoln Bridge is one of the first major bridges in North America on which a rational durability study was explicitly performed and incorporated into the design process. COWI engineers applied a "ruthless approach" to make every aspect of the project durable.

The bridge is designed to withstand a significant terrorist threat and cable loss and has high fracture toughness and a 100-year service life design. It can handle significant ship collision, incorporates substantial blast protection and features significant redundancy.

The foundation system played a critical role in the speedy completion of this project, which was finished four months ahead of schedule.

Special Projects

National finalist: Gold award

Hart Crowser

Project: Governors Island Park and Public Space
Client: West 8 Urban Design & Landscape Architecture

Hart Crowser helped transform a formerly flat site in New York City into a destination park with steep hills as high as 80 feet.

PHOTO BY TIMOTHY SCHENK

Before its transformation, New York City's Governors Island was a flat parcel of land that had been used in a number of ways over the years.

The former Revolutionary War fort and Civil War arsenal was expanded 100 years ago using fill that was barged and dumped from a subway excavation. It was later converted to a Coast Guard base with more than 3,500 residents. Following its decommissioning in the mid-1990s, the site was languishing.

West 8 Urban Design & Landscape Architecture won a design competition to transform the island in 2007. The 170-acre parcel, a seven-minute ferry ride from Lower Manhattan, was transformed into a destination park enjoyed by more than a million visitors a year.

Hart Crowser performed the geotechnical engineering. Magnusson Klemencic Associates was the civil engineer, Matthews Nielsen Landscape Architecture was the landscape architect, and Turner Construction was the general contractor.

The site now has rolling meadows, playfields, recreational areas, and — its signature feature — four large hills rising as high as 80 feet above the surface of the harbor, allowing 360-degree views of the city.

Creating these dramatic hills on a formerly flat site was a challenge that Hart Crowser embraced. The best spot for the hills was right next to the island seawall and on top of 100 feet of soil from the Lexington Avenue subway excavation. The soft soil wouldn't support the steep hill: The man-made hill on the fill wanted to slide into the harbor.

To determine the likelihood of this happening, Hart Crowser performed exhaustive testing and analyses of the site. This included examining existing soil, creating 3-D models to test for potential failure, measuring soil drainage and looking for evidence of weakness in the deep glacial clays offshore. With every analysis, it became clearer that understanding the soft soil behavior was the key to creating this signature New York City park.

Hart Crowser devised ways to make the slopes steep and allow the landscape architects to sculpt the sides and create an environment for dense, slope-anchoring vegetative growth. By reinforcing the steepest slopes with man-made, elongated sheets of high-density polyethylene called geogrids, Hart Crowser was able to add strength to the soil along the slopes and allowed them to be built as steep as a 45-degree angle.

Engineers made the heaviest sections lighter by using a lightweight volcanic rock as fill that weighs only about half of typical soil fill and possesses just as much strength. Hart Crowser's model determined where the lightweight fill was required, how deep or thick it needed to be, and how far back into the hills it needed to extend to reduce the unstable forces on the soft subsoils and increase the safety factors against slope failure.

Hart Crowser also incorporated all the construction debris from the site — nine major buildings' worth — into the project. Fifty-thousand cubic yards of construction debris was processed on-island to a maximum size of 8 inches so it would drain rapidly, and placed in lifts in the middle of the hills.

Hart Crowser designed the project to stand up to major windstorms, rainstorms and even hurricanes. Its resilient design was tested recently by Hurricane Sandy and passed with flying colors. Despite being hit by a 14-foot wall of water and buffeted by 80 mph winds, the island's 3,000 new trees and newly planted salt water-resistant grasses and shrubs stood strong.

The Elliott Bay Seawall's precast concrete elements were designed also to protect fish habitat.

PHOTO PROVIDED BY PARSONS

Special Projects

National finalist: Gold award

Parsons

Project: Elliott Bay Seawall
Client: Seattle Department of Transportation

Parsons was the prime consultant on the Seattle Department of Transportation's Elliott Bay Seawall project. Its plan for replacing the existing 100-year-old downtown seawall included protections from wind-driven storm waves and erosion as well as support and protection of major utilities, state Route 99, the ferry terminal and nearby rail lines.

The project replaced three types of deteriorated seawall structures, ranging in width from approximately 15 to 60 feet. It also created a salmon migration corridor and near-shore habitat.

Consultants joining Parsons on the project included COWI and Exeltech. Mortenson/Manson was the joint-venture contractor.

Parsons' solution paired a soil-strengthening system with secondary structural elements that, together, provide the static and dynamic load-carrying capacity of the system. The improved soil mass, or ISM, approach involved a zone of secant jet-grouted, soil-cement columns in which soil is mixed with cement grout.

The use of jet grouting allowed for the construction of a large-diameter column from a small-diameter hole — necessary on a project that was hemmed in by existing timber piles left over from the original seawall's construction as well as existing utilities that had to remain in place during construction. The ISM was a key component of the lateral-force resisting system.

The system was coupled with more than 1,200 concrete precast elements to accelerate construction and reduce project cost. Many of these precast elements were designed to also improve fish habitat and increase overall ecosystem health.

An uninterrupted intertidal "migratory bench" runs the length of the seawall, providing improved bottom substrates that young fish are attracted to. Textured habitat shelves and panels along the face of the seawall promote marine growth.

And custom precast panels inset with glass provide an illuminated pathway underneath a 15-foot cantilevered sidewalk. This eliminates the shadows and canyons created by Seattle's urbanized shore that had drastically impacted the migration of native salmon.

The critical location of the ongoing project — abutting major tourist attractions such as the Seattle Great Wheel, Ivar's Acres of Clams, Ye Olde Curiosity Shop and the Seattle Aquarium — meant that considerable planning was required to keep businesses open and the public safe.

Work zones along the seawall replacement were developed as discrete work areas with barriers and fencing, with gate staff to manage the construction traffic and pedestrian movements. Access to the pier businesses was maintained using temporary pedestrian bridges across the excavation, which had the additional benefit of allowing the public to see the construction of the new seawall in progress.

Far-reaching communication programs were put in place throughout the project, from design through construction. The public outreach team's social media efforts included a project Facebook page and Twitter account in addition to occasional blog posts by SDOT. Weekly project updates were sent out via email, and the outreach team staffed informational booths at several area fairs and festivals to keep the public informed.

The end result is a seawall that protects Seattle's waterfront as well as habitat below the water's surface.

Successful Fulfillment of Client/Owner Needs

Best in State: Gold award

GeoEngineers

Project: Palermo data gaps and feasibility study
Client: Washington State Department of Transportation

GeoEngineers carried out an air monitoring program in Tumwater using a direct sensing technology that cut costs in half.

PHOTO PROVIDED BY GEOENGINEERS

When the Washington State Department of Transportation was identified as a potentially liable party in the cleanup of a chemically contaminated site in Tumwater, they turned to GeoEngineers to help them understand the full extent of the problem.

As the prime environmental consultant on the job, GeoEngineers used creative solutions and adaptive technologies that ultimately shaved years off the schedule and reduced investigative costs by half.

Back in the 1990s, routine testing identified industrial solvents in groundwater in the Palermo Wellfield. Because the chemicals were affecting drinking water and the extent of contamination was so widespread, the area around the wellfield qualified as a federal Superfund site.

The Environmental Protection Agency addressed immediate concerns, but its solution was not completely effective in mitigating site contamination. Contaminated groundwater has since migrated to the Palermo neighborhood, a group of approximately 50 homes in Tumwater below a steep bluff.

WSDOT contracted with GeoEngineers to provide a "data gaps" analysis so the agency could fully understand the scope of the issue. Additional consultants included Columbia Technologies, Holt Services and Eurofins Air Toxics.

GeoEngineers' work also included an extensive air-monitoring program to determine if vapor intrusion in the homes was a problem. Both jobs used new technology and creative solutions to address the issues. The results of these efforts have changed the practice of environmental investigations by validating new technologies and building confidence with the EPA.

To identify the extent of the contamination, GeoEngineers needed an approach that could collect subsurface data in a rapid, efficient and cost-effective manner. A conventional drilling, sampling and analysis program could narrow the data gaps, but it would be time consuming and expensive.

GeoEngineers determined that membrane interface probe (MIP) direct sensing technology would allow them to collect a large amount of information that could be applied flexibly across the site. The team tracked low-level solvent contamination across an approximately half-square-mile area — the largest known area ever evaluated using an MIP device in EPA Region 10 (comprising Alaska, Washington, Oregon and Idaho). This approach enabled GeoEngineers to pinpoint the exact location of contamination and make adaptive field decisions in a timely manner.

The air monitoring program sought to determine whether vapor intrusion was still occurring in the nearby homes — something the EPA had confirmed early on in their investigation. Initial air sampling showed lower-than-anticipated levels, so it was determined that the best way to test for vapor intrusion would be a simulated worst-case scenario.

GeoEngineers rented a vacant home in the part of the neighborhood known to have to highest historic contamination concentrations and conducted two separate worst-case scenario tests in the home during two different seasons. Tests involved reducing indoor air pressure by sealing the openings in the home and using industrial fans to vent to the exterior. Results showed vapor concentrations to not be an immediate concern.

GeoEngineers' contributions to the project allayed concerns about air quality in homes and provided actionable information to WSDOT. The detail of the findings enabled remediation to be correctly scaled to match the need, thereby reducing costs to taxpayers and minimizing impact on the affected community.

The exploration program was completed in one year and cost $1.5 million, as opposed to three years at a cost of $3 million for a traditional exploration program.

NATIONAL SILVER AWARDS

TRANSPORTATION

HDR
Project: South 200th Link extension
Client: Sound Transit

ENVIRONMENTAL

HDR
Project: Factoria Recycling and Transfer Station
Client: King County Solid Waste Division

SPECIAL PROJECTS

HDR
Project: Wells Hatchery modernization
Client: Douglas County Public Utility District

Unique or Innovative Applications

Best in State: Gold award

Golder Associates helped design and install a plant-based soil decontamination system at Del Monte's Oahu plantation.

PHOTO PROVIDED BY GOLDER ASSOCIATES

Golder Associates

Project: Del Monte (Oahu Plantation) Superfund site
Client: Del Monte Fresh Produce

At the completion of a remedial investigation at the Del Monte Corp. Superfund site on the Hawaiian island of Oahu, Del Monte Fresh Produce faced a major problem.

More than 1,000 cubic yards of soil contaminated with chemical fumigants had been generated. The presence of the chemicals required that the soils be handled as hazardous waste. Because there are no treatment facilities on the Hawaiian islands, the soil would need to be shipped to Oregon for incineration at a cost of more than $3.5 million.

The fuel involved in shipping would also impact the environment. Additionally, the planned remedial action for the site included continuous pump-and-treat of impacted groundwater, which would also continue to generate hazardous waste requiring disposal.

Golder Associates worked with the owner to design, test and put into full operation a "phytoremediation" system at the site. Phytoremediation — the use of living plants to decontaminate soil or water — had not previously been used for the remediation of these specific soil fumigants. The system would treat both the impacted soils from the remedial investigation and clean up the impacted groundwater continually generated during the ongoing site remediation.

The project began with bench-scale testing conducted by the University of Washington, which showed a plant called koa haole to be capable of metabolizing the chemicals.

Golder then worked with Del Monte to develop a pilot-scale phytoremediation system at the site to test if impacted soils and groundwater could be remediated using koa haole. The two-year project showed positive results, so Golder designed and installed a full-scale phytoremediation system.

The system includes 35 perched groundwater monitoring wells equipped with automatic pneumatic pumps to provide continuous dewatering of the contaminated portions of the aquifer. The contaminated water is collected in a 9,000-gallon tank, equipped with electronic float switches that direct the contaminated water to the phytoremediation treatment cells.

The treatment cells require very little maintenance: only occasional replacement of the drip irrigation lines and trimming of the koa haole trees is needed. The system was designed to allow for mostly autonomous operation that provides continuous capture and treatment of the contaminated groundwater.

The full-scale system has operated since 2008 and has successfully treated more than 4.7 million gallons of groundwater to concentrations below drinking water standards. Based on the sustained reduction in contaminant concentrations, Del Monte and Golder will request that the Environmental Protection Agency approve a shutdown of the treatment system in 2018.

Social, Economic and Sustainable Design

Best in State: Gold award

J-U-B Engineers

Project: Pullman-Moscow Regional Airport mitigation
Client: Pullman-Moscow Regional Airport

The Pullman-Moscow Regional Airport's realignment project required a large-scale mitigation effort to compensate for 22 acres of combined wetland and stream impacts at the airport.

Mitigating these impacts in close proximity to the airport was not feasible since wetlands and streams attract wildlife that can be hazardous for airport operations. Because of these restrictions, the airport needed to locate the mitigation property more than two miles away, yet still within the same watershed.

As a subconsultant to Mead & Hunt, the project's primary consultant, J-U-B Engineers, obtained permits, secured land, designed and procured bids, and managed construction in a short six-month turn-around period. The project yielded the largest mitigation site, in terms of area, in eastern Washington.

The site includes the creation of 8 acres of rivertine wetlands, the enhancement of 13 acres of existing rivertine wetlands, the preservation of 91 acres of adjacent and contiguous upland buffer areas, and the installation of thousands of plants, shrubs, trees and boulders.

The mitigation project is unique because it occupies a large, 113.6-acre continuous tract of land, rather than spreading resources between smaller isolated mitigation sites. This utilizes a more holistic approach to wetland and stream mitigation that provides greater habitat diversity and wetland functions.

The establishment of the mitigation site has also resulted in several benefits to the region. The site influenced the creation of companion projects, such as the enhancement of approximately 87 acres adjacent to the site by property owners Tom and Cheryl Kammerzell.

The mitigation site improvements also provided flood storage to those located down-gradient of the project site. After a heavy winter in 2016, the site leveled out the south fork of the Palouse River, dissipating floodwaters and bringing energy out of the river system.

An important component of the success of the mitigation site is biological monitoring and maintenance. J-U-B worked with the airport through its contractor for two years to monitor and maintain the mitigation site, with the airport continuing oversight for eight more years to ensure the native plantings are established and will not need further attention for long-term survival.

Initial monitoring showed favorable performance, except for survival rates for ponderosa pine and Douglas fir plantings, which experienced high mortality rates due to animal browsing and plant installation techniques. By creating a protection system of biodegradable tubes and bamboo stakes around the replacement plantings, the trees bounced back, resulting in a 60.5 percent improvement the following year.

A 113.6-acre wetland mitigation project for the Pullman-Moscow Regional Airport was the largest in eastern Washington.

PHOTO PROVIDED BY J-U-B ENGINEERS

Future Value to Engineering Profession

Best in State: Gold award

MIG|SvR

Project: Barton CSO control with green infrastructure
Client: King County Wastewater Treatment Division

In an effort to control repeated combined sewer overflows near a popular Seattle park, King County's Wastewater Treatment Division decided to try a new approach.

The Barton combined sewer system was experiencing an average of four overflows a year, which discharged a total of approximately 4 million gallons of polluted runoff into Puget Sound near Lincoln Park.

The Wastewater Treatment Division typically constructed an underground storage tank on a single parcel to control CSOs, but decided in this case to use the green stormwater infrastructure solution. They chose MIG|SvR as the consultant.

The result is dozens of roadside bioretention systems — or highly engineered "rain gardens" — that pair with underground infrastructure to further infiltrate the water, reducing or eliminating overflows.

This was the first project where the Wastewater Treatment Division utilized green stormwater infrastructure to control combined sewer overflows — specifically, 91 bioretention cells connected to an underwater drain that conveyed flows to an underground injection control screen well for deep infiltration.

This approach was taken when the site assessment process determined that soils near the surface were not suitable for shallow infiltration. However, a large layer of receptive soils were found further below the hard-packed glacial till.

The team developed a new approach to the typical urban roadside bioretention system by using the screen wells to infiltrate the treated water. The team worked closely with the county's operations and maintenance staff to ensure the screen wells would be accessible for monitoring and any needed repairs.

The project also involved one of the more complex street improvement permitting projects the department had undertaken in a Seattle neighborhood.

The project started in 2011, after a 2008 county report showed significant combined sewer overflows in the Barton combined sewer system basin. The project team focused on one sub-basin that contributed 45 percent of the stormwater flows in the basin.

Within this 72-block area, the team assessed each city block for the possibility of a rain garden. Ultimately, 19 residential blocks were selected for design and permit approval, and 15 were constructed between 2013 and 2015.

King County worked with MIG|SvR to install dozens of roadside bioretention systems to reduce combined sewer overflows.

PHOTO PROVIDED BY MIG | SVR

The project received a platinum rating using King County's sustainable infrastructure scorecard, which looked at site sustainability, water efficiency, energy and atmosphere, materials and resource, outdoor and environmental quality, and innovation.

The project is a passive system that requires minimal operating costs, and native and drought tolerant plants reduce irrigation requirements. Coordinated design with the county's operations and maintenance staff ensured that maintenance can be performed without specialized equipment.

It is estimated the Barton project will divert approximately 6 million gallons of stormwater from entering the combined sewer system per year, reducing treatment plant and water conveyance costs.

Complexity

Best in State: Gold award

Stantec

Project: Kadlec Regional Medical Center Utility Plant
Client: Kadlec Regional Medical Center, Davis Partnership

Stantec designed a utility plant upgrade in Richland that required replacing switchgear in tight quarters without cutting off power.

PHOTO PROVIDED BY STANTEC

Performing electrical work at a medical center providing critical care is always a difficult task. Stantec faced particularly unique challenges during the equipment upgrades and replacements at Kadlec Medical Center's utility plant, requiring the electrical engineer to come up with innovative solutions in order to meet the owner's needs.

The Richland medical center's expansion from a six-story building to a 10-story building meant the central utility plant would have to grow as well. However, the medical center is on a site that is landlocked by natural topography, allowing no options to add physical space to the plant building or build a new facility.

Working with Davis Partnership architects, Stantec's engineers were challenged to devise a new and complex plan to replace two generators, the paralleling switchgear and transfer switches in extremely tight conditions, and in the exact same spaces as the existing equipment.

The next challenge: how to keep the power flowing during construction for the critical life-saving functions of the medical center, which operates 24/7. Since shutting the power down was not an option, the engineers designed an intricate plan that included using a "leapfrog" methodology and extraordinary coordination efforts to get the job done.

Engineers had to put the entire hospital's essential system load onto a single generator while replacing the other generator and portions of the paralleling switchgear. To accomplish this complex task, electrical engineers developed a phasing plan based on the electrical loads supported by the current transfer switches and the available physical space to add new paralleling gear sections.

When the new gear was brought in and butted up against the old switchgear lineup, the loads were connected to the new equipment, starting the process of eliminating the old switchgear sections. Next, selected distribution sections on the outgoing gear were removed, freeing up space at the end of the new switchgear, which allowed for new sections to be installed and connected.

This "leapfrog" methodology was followed to the point where the building's essential load could be connected to the new paralleling switchgear and new generator, which allowed for the second generator to be removed and replaced.

The result was the successful completion of a complex engineering scheme, a precisely choreographed dance of equipment replacement and cutovers, and a power supply that is robust and flexible for the expanded building well into the future.

Making way for new equipment in already cramped spaces was another challenge. The space between the switchgear and transfer switches was only 4 feet, requiring considerable planning, fieldwork and contractor coordination to remove and replace the critical equipment.

Critical power cutovers followed detailed work plans with back-out procedures identified in the event of unforeseen issues. Coordination meetings were held to identify potential impacts with each department so they could be addressed prior to the cutover, and the team walked through the process with the contractor, Bouten Construction, prior to construction.

The project was completed on time, within budget, and with change orders that equaled less than 1 percent.

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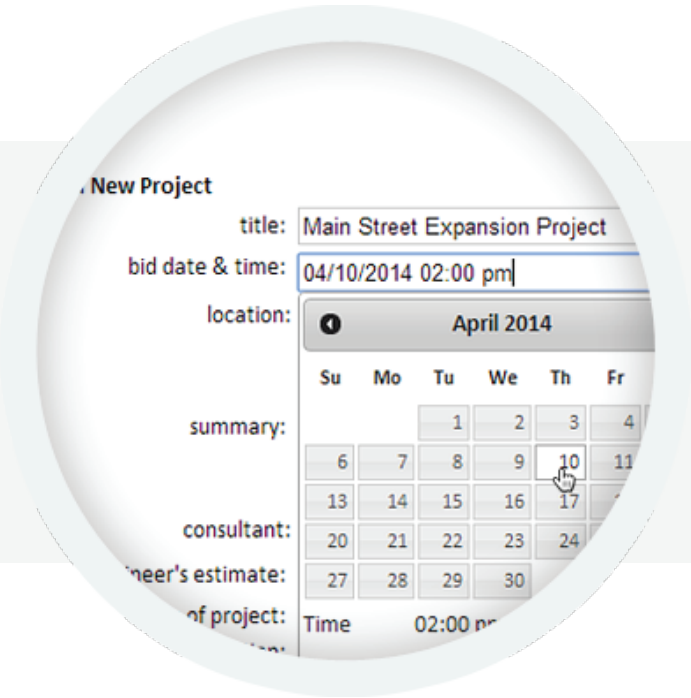

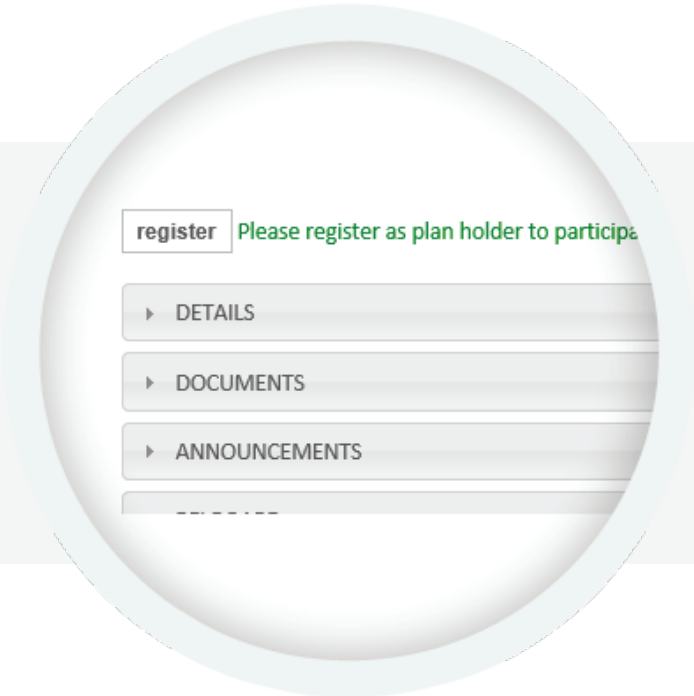

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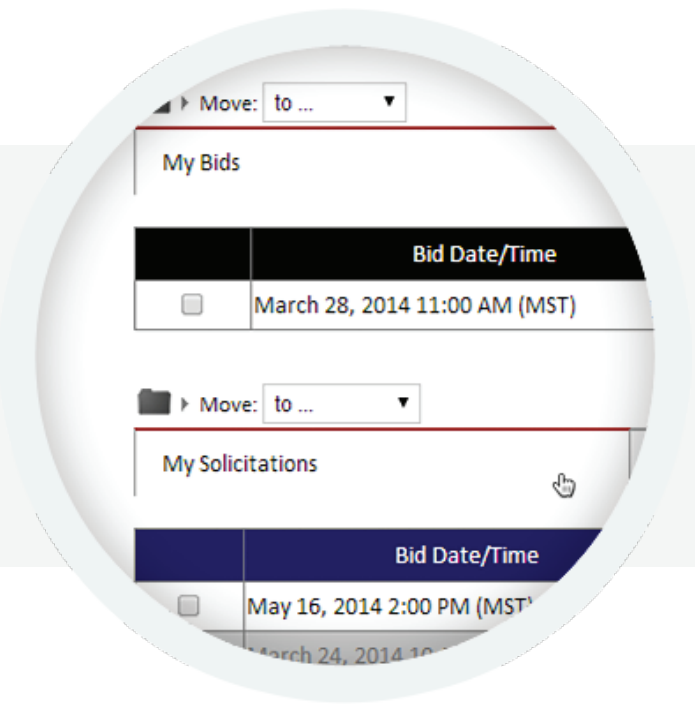

Free for public agencies in Washington

Engineer of the Year

Jeff Peacock
Parametrix

Jeff Peacock, president and CEO of Parametrix, is a civil engineer with 38 years of experience, primarily on transportation projects. He's been with Parametrix for 28 years.

Peacock's career began at the Washington State Department of Transportation as a senior design engineer with the Olympic Region, where he was responsible for planning, design and construction management. As a consultant, he has managed some of the largest infrastructure projects in the Northwest.

Peacock is known as a skilled problem solver, and has been heralded for his work with the public, elected officials, and state and local agencies to gain consensus for controversial, high-profile projects. His colleagues say he has a knack for translating complex engineering solutions into layman's terms to gain support for solutions, and is committed to making sure large transportation programs address neighborhood and environmental concerns.

"(Peacock) has dedicated his career to enhance our transportation systems in Washington state while caring for environmental sustainability and quality of life for communities," said Paula J. Hammond, senior vice president of WSP USA, who worked with Peacock at WSDOT. "He is a person of high integrity and character, both essential qualities in our profession."

Since 1998, Peacock has been a pivotal figure on the state Route 520 Floating Bridge Replacement and HOV Improvements program. Initially, he managed the Trans-Lake Washington Study, and has since served as a strategic advisor to the team completing the environmental impact statement and serving as general engineering consultant for the entire corridor.

He has also made significant contributions to the evolution and implementation of the Puget Sound area's regional transit system over the last 20 years, having served as principal-in-charge of Central Link and Lynwood Link light rail projects.

For the Lynnwood Link Extension, Peacock was involved in the integration of the NEPA environmental process with the ongoing engineering design and planning work scopes. For the Central Link project, which touched King, Pierce and Snohomish counties, Peacock oversaw NEPA/SEPA environmental compliance and related environmental services.

As an active member and current co-chair of the ACEC-Sound Transit liaison committee, he has advocated for passage of Sound Transit's funding packages. Peacock has also been a passionate advocate for legislation, initiatives and other transportation funding packages. Further, he has engaged in strategizing legislative initiatives supporting the engineering community, including support for public agency indemnification and contracting reform and opposition to B&O tax increases on engineering services.

Jared Smith, ACEC's Engineer of the Year in 2006, worked with Peacock on many high-profile infrastructure projects in the Puget Sound region. He was especially complimentary of Peacock's consistent focus on his clients and the public his projects have served.

"He is a great example of a leader who 'does well by doing good,'" said Smith. "He has operated in the most ethical manner and I always found him and his firm to be a tremendous teaming partner."

In addition to the SR 520 and Link light rail projects, Peacock has played a significant role in a number of other high-profile regional projects, including:

- **Alaskan Way Viaduct and Seawall replacement program.** Peacock served as principal-in-charge and a strategic advisor for the project. Parametrix was part of a multi-consultant team to evaluate the alternatives and design a new viaduct through Seattle's waterfront district.
- **Hood Canal Bridge replacement.** Peacock worked directly with WSDOT executive management as a strategic advisor in developing an approach for the reconstruction of the floating bridge.
- **Seattle Monorail Green Line EIS.** As the principal-in-charge for the draft and final environmental impact statement for the proposed 14-mile elevated transit system, Peacock led the completion of environmental documents in a compressed 14-month schedule.
- **US 101 Washington Coastal Corridor master plan.** Peacock managed the development of a corridor management plan for the Washington Coastal Corridor Scenic Byway, consisting of 355 miles of U.S. 101 and nearly 300 miles of other state routes that connect US 101 with the coast.
- **Bremerton Ferry Terminal improvement project.** As project manager, Peacock was responsible for the planning of the first design-build ferry terminal in Washington. Responsibilities included development of the terminal layout and overhead transit deck as part of the $160 million public-private partnership to redevelop six blocks of downtown Bremerton adjacent to the Puget Sound Naval Shipyard.

Peacock participates in a number of professional organizations and has further contributed to the engineering profession by serving on a variety of committees and actively participating in CEO leadership roundtables and forums. In addition to co-chairing the ACEC-Sound Transit liaison committee, Peacock was recently a panelist at the Environmental Financial Consulting Group's annual CEO conference. He has spearheaded Parametrix's community involvement efforts, including the Special Olympics 2018 USA Games in Seattle and 2009 World Winter Games in Boise, Idaho; several Northwest Tribal Canoe Journeys; and annual fundraising drives for United Way. Personally, Peacock is a supporter of the Washington Opportunity Scholarship, Mary's Place, Planned Parenthood, Heifer International, Kitsap Community Foundation and the Washington Historical Society.

The American Council of Engineering Companies of Washington has selected an Engineer of the Year every year since 1959.

BEST IN STATE

SILVER AWARDS

SUCCESSFUL FULFILLMENT OF CLIENT/OWNER NEEDS

BROWN AND CALDWELL
Project: CSO reduction program
Client: City of Port Angeles

COWI NORTH AMERICA
Project: Baring Bridge emergency repair
Client: King County

HART CROWSER
Project: F5 Tower
Client: Daniels Real Estate

SOCIAL, ECONOMIC AND SUSTAINABLE DESIGN

DAVID EVANS AND ASSOCIATES
Project: Confluence Park Pedestrian Bridge
Client: Issaquah Parks & Recreation

UNIQUE OR INNOVATIVE APPLICATIONS

FSI CONSULTING ENGINEERS
Project: Boeing Charleston Decorative Paint Facility
Client: The Boeing Co./Live Oak Consultants

NOTKIN MECHANICAL ENGINEERS
Project: EvergreenHealth PCU HVAC upgrades
Client: EvergreenHealth, Salus Architecture

FUTURE VALUE TO ENGINEERING PROFESSION

HNTB
Project: Interstate 405 northbound peak-use shoulder lane
Client: Washington State Department of Transportation

COMPLEXITY

HW LOCHNER
Project: State Route 520 Eastside transit & HOV project
Client: Washington State Department of Transportation

PCS STRUCTURAL SOLUTIONS
Project: WSU Elson S. Floyd Cultural Center
Client: Washington State University, GGLO

WSP
Project: Tacoma Amtrak Cascades Station
Client: Washington State Department of Transportation

BEST IN STATE

BRONZE AWARDS

SUCCESSFUL FULFILLMENT OF CLIENT/OWNER NEEDS

J-U-B ENGINEERS
Project: Deer Park Lagoon liner and hydraulics upgrades
Client: City of Deer Park

TRANSPO GROUP
Project: Mercer Street adaptive signal control
Client: Seattle Department of Transportation

SOCIAL, ECONOMIC AND SUSTAINABLE DESIGN

RH2 ENGINEERING
Project: Esquatzel Pumping Plant
Client: South Columbia Basin Irrigation District

UNIQUE OR INNOVATIVE APPLICATIONS

GOLDER ASSOCIATES
Project: Arrive Tower
Client: Molasky Group of Companies

PARAMETRIX
Project: Welcome Plaza and Lift Station
Client: City of Gig Harbor

FUTURE VALUE TO ENGINEERING PROFESSION

GEOENGINEERS
Project: LNG site seismic study and ground improvement
Client: Puget Sound Energy

REID MIDDLETON
Project: Morse Lake Pumping Plant
Client: Seattle Public Utilities

COMPLEXITY

HNTB
Project: Sea-Tac Airport dining and retail upgrades
Client: Port of Seattle

OTAK
Project: Redmond Central Connector, phase 2
Client: City of Redmond

STANTEC
Project: Fremont Siphon replacement and Odor Control Facility
Client: King County Wastewater Treatment Division

ACEC

American Council of Engineering Companies
of Washington

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- ACEC Washington is your primary resource for business practice information and education
- ACEC Washington is the voice of the consulting engineering industry in Washington State

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Improving the Business of Engineering!

One of the primary functions of ACEC of Washington is to lobby the Washington State legislature on behalf of the engineering community, with a view towards obtaining favorable outcomes to proposed new legislation affecting engineering firms throughout the state. Becoming a member of ACEC of Washington is definitely a good investment!

Barry S. Knight, PE, President/CEO, CTS Engineers

Our ACEC of Washington membership is a valuable, year-round resource worth much more than the annual membership fee. We've posted local openings on their job board, sent new managers to the Core Competencies for Professionals series, and brought contracting and funding concerns to their attention with positive results.

Kristen A. Betty, PE, Chairman of the Board, KBA, Inc.

Through the efforts of ACEC, we continue to build paths that help us collaborate more successfully with our clients and be more innovative on the projects we help develop for our communities. ACEC is the voice that represents our collective business interests.

Mike Clark, Transportation Group Manager, David Evans and Associates, Inc.

I am a member of ACEC of Washington because advocacy for small engineering firms has never been more important. ACEC provides invaluable tools, information and networking opportunities to help my business thrive in a highly competitive, rapidly evolving market.

Robin Kirschbaum, PE, LEED AP, ENV SP, President, Robin Kirschbaum, Inc.

ACEC provides advocacy to consulting engineering firms on issues that are of critical importance to our industry.

Roger W. Flint, President/Chief Operating Officer, Parametrix