ACEC Virginia Proudly Presents the Winners of the 2020 Engineering Excellence Awards

Competing firms won awards for some of the most innovative, dynamic projects in the years we have seen. The firms presented their skills through complex, inventive, environmentally challenging, and value-driven projects. The judges for the 2020 Engineering Excellence Awards reviewed 22 projects ranging from restoration projects to water improvements for our community. We thank each firm for taking the time to submit their projects and appreciate your hard work and dedication to the field of engineering. Projects will receive recognition at our EEA Gala at the Jefferson Hotel in Richmond, VA, on Thursday, February 6, 2020. Projects receiving a Grand Award are eligible for the highest honor, The Pinnacle Award. We’re thrilled to honor these firms below for their exemplary work in engineering – and the winners are:

GRAND AWARD WINNERS

All winners in this category are eligible for the Pinnacle Award, which is awarded to the best overall project the evening of the Engineering Excellence Awards.

HDR Engineering, Inc.
Virginia Initiative Plant: Nutrient Reduction Improvements, Norfolk

Facing a sanitary sewer overflow consent decree and imminent stricter treatment limits, the $161 million Virginia Initiative Plant Nutrient Reduction Improvements project lowered nutrient discharges, expanded hydraulic capacity, and replaced aging equipment. A unique, versatile bioreactor provides treatment flexibility, allowing in series or in parallel operation with the existing 3-stage nutrient removal processes to achieve required effluent quality of 5 mg/l total nitrogen and 1 mg/l total phosphorus and increase the peak flow capacity from 80 MGD to over 120 MGD. Using a phased delivery approach and fast-tracked construction schedule, the team completed the project on budget and on schedule.
Kimley Horn and Associates, Inc.
Interstate 81 Corridor Improvement Plan
Kimley-Horn assisted the Virginia Department of Transportation (VDOT), the Office of Intermodal Planning and Investment (OIPI), and the Department of Rail and Public Transportation (DRPT) in developing an improvement plan for 325 miles of I-81 in Virginia. The study team identified segments of I-81 with safety and congestion issues and developed targeted improvements. The package of improvements ranged from operational improvements focused on detecting and removing incidents to capital improvements focused on adding capacity. The plan included strategies like corridor-wide incident management improvements, truck parking recommendations, and estimated impacts on the economy and trucking industry from revenue-generating alternatives.

Mason & Hanger
New US Embassy Campus, Pristina, Kosovo
To support the new nation in 2008, the United States built an embassy in the capital, Pristina. The fledgling nation had a fragile infrastructure and limited resources, which presented unique challenges and opportunities for the engineering design team. To ensure the mission can be maintained at all times, Mason & Hanger performed detailed planning and simulations to achieve a resilient, self-sustaining campus and ensure each design strategy contributed to multiple program objectives. The embassy is centered around a large water feature that serves as a collection reservoir for site stormwater as well as effluent from the site’s wastewater treatment plant. The same pond serves a source for site irrigation water and gray water used within the buildings. Also, the water serves as a large heat sink for the central plant’s highly-efficient ground-source heat pump system. The pond acts as a thermal battery allowing the building’s HVAC system to extract heat in cold months and reject waste heat in warmer weather. The combined effects result in the site being nearly net-zero about annual water use, almost 40% more than typical, code-compliant buildings, all while providing a quiet, pleasing environment, a home for native plant and animal species, and reduced operating and maintenance costs.
Speight Marshall and Francis
Leaning Tower of Granby Historical Renovations, Norfolk
To straighten the 3,250-ton “Leaning Tower of Granby,” a feat that had never been accomplished on a building so tall, required studying the building’s soul for a decade and applying engineering ingenuity to develop a unique process and jacking procedure that had never been utilized. The methodical, pioneering plan Speight Marshall Francis developed of jacking the columns inch by inch until the building stood straight took four days. The 12 ½ inches of settling that began in 1912 was corrected. The building now stands magnificently as Savoy Apartments—a preserved historical gem with a spectacular story embedded within its walls.

HONOR AWARD WINNERS

AECOM
Franklin Road Bridge Over NS Railway, Roanoke
This new bridge establishes the gateway between downtown Roanoke and the Old Southwest historic neighborhood to the north and an academic medical campus and recreational facilities to the south. Both approaches are flanked by concrete pylons with decorative panels showcasing Old Southwest’s architectural elements that come to life at night with LED backlighting. Wide sidewalks and dedicated bike lanes allow the community to enjoy safe access for all travel modes.

Austin Brockenbrough & Associates, LLP
Rehabilitation of Historic Structures at Walnut Valley Farm, Chippokes Plantation State Park
This two-story, 2,500 square feet, Walnut Valley plantation house, was built circa 1770. Conceptually, the approach taken towards the renovation of the plantation house was to keep it as a “living” building, not a museum. It continues its use as a dwelling, one that can be rented by the public, and allows the user not just to observe the house, but to experience it by living in it. Techniques included new ideas and the use of historical methods to create a beautiful and functional facility, using creative planning and detailing. This approach allowed the maximum amount of historic fabric to remain while creating an accessible and usable facility. Through thoughtful planning and the use of public resources, this historic property has been preserved for future generations to use interactively.
Clark Nexsen and Kimley Horn & Associates, Inc.  
Nansemond Parkway and Portsmouth Boulevard Improvements  
The City of Suffolk and the City of Chesapeake, under a cooperative agreement, completed the widening of the Nansemond Parkway/Portsmouth Boulevard corridor. The approximately 1.5-mile project provided not only much-needed capacity and safety improvements for motorists along the corridor but also provided improved safer access for bicyclists and pedestrians along the heavily traveled roadway. The project represents regionalism and collaboration executed at the highest level, as two cities, two design firms, and multiple other partners effectively merged two projects for the construction phase.

Dewberry  
Raw Water Transmission Main, Loudoun Water  
The 5.5 mile-long, 36-48” diameter Raw Water Transmission Main (RWTM) designed by Dewberry provides Loudoun Water with a sustainable and resilient water supply serving more than 75,000 households in Loudoun County. The welded steel pipeline features a robust cathodic protection system and special coatings to achieve a 100-year lifespan. Twenty air-vacuum valve vaults protect the pipeline from surges. An innovative water banking program allows water storage in future abandoned quarries for use during low flows on the Potomac River. Fiscally responsible, Dewberry exceeded Loudoun Water’s goals, doing so for 80% of its construction management budget and with only 1.3% change-orders.

DJG  
Warehouse 15, Bay H Renovations, Richmond  
After this 22,077 square foot renovation, Bay H shows its historic roots as a railway warehouse built to help World War II mobilization efforts. Natural light still streams through from clerestory glazing, and the wood roof planks still function as a ceiling. The new systems offer 21st-century engineering advances, such as translucent walls, metal mesh ceilings, high-efficiency mechanical and lighting systems, and durable but eye-catching finishes. DJG was able to economically condition large open spaces and still offer controlled climates to small spaces, using a specialty selected HVAC system, a custom air handling unit, and a high-efficiency air-cooled chiller.
Draper Aden Associates
The American Civil War Museum, Richmond
Resulting from the merger of the American Civil War Center and the Museum of the Confederacy, the American Civil War Museum needed a facility that provided a nuanced and thoughtful approach to the study of the Civil War. Needs included additional exhibition space, expanded research and archive storage, and administrative offices, all while squeezing between existing historic buildings, set into a hillside which incorporates ruins from the historic Tredegar Iron Works. Two primary challenges required an innovative application of engineering techniques to address the difficulty and reach a good solution for the client. First, the site's historical significance, its constrained nature around existing buildings, and pre-Civil War underground tunnels required clever site design and civil engineering solutions, as the tunnels and existing structures proved particularly complex. Utilizing cutting-edge scanning technology, DAA developed dynamic scans and plans that visualized the tunnels and existing ruins, allowing utilities to be designed and incorporated into the new facility without disturbing these historic features.

ECS Mid-Atlantic
Capitol Crossing, Washington, DC
As one of the largest undeveloped sites in downtown Washington, DC, Capitol Crossing has dramatically transformed the area by reconnecting the Capitol Hill and East End neighborhoods. The development opened streets to through-traffic, created new pedestrian promenades and bicycle lanes, brought dynamic retail businesses to residents and businesses, and offers opportunities for companies to lease large blocks of contiguous space.

RS&H
Lesner Bridge, Virginia Beach
The Lesner Bridge project involved the replacement of the existing bridges with twin pre-cast segmental box girder bridges. Each new bridge is 1,575’ long and provides a 45’ navigational clearance over the Lynnhaven Inlet. The superstructure was built using the span-by-span and balanced cantilever erection methods. Each structure consists of ten spans; nine at 150’ with a channel span of 225’ and include nine piers and two abutments. The new bridges greatly improve the corridor by providing wider lane widths, wider shoulders, new 10’ multi-use paths in each direction. The project also included 8,000 PSI superstructure concrete, low permeability concrete, corrosion-resistant reinforcing steel, and the latest industry-driven project specifications for post-tensioning operations to ensure additional service life up to 100 years.
Walter P. Moore  
University of Virginia Health System University  
Hospital Expansion, Charlottesville  
To meet the growing demand of the UVA Hospital System, UVA embarked on a major expansion to increase patient bed capacity by 50%, adding 450,000 SF of new space and renovating another 95,000 SF. The project added a new 80-bed tower, expanded their interventional platform, and increased emergency capacity.

Whitman Requardt & Associates  
Jamestown - Scotland Ferry Dolphin Replacement  
The Jamestown-Scotland Ferry is a Virginia Department of Transportation (VDOT) operated vehicle ferry near Williamsburg. Whitman, Requardt & Associates, LLP (WRA) studied replacement options for failure-prone timber berthing dolphins, designed the selected large fiber-reinforced polymer (FRP) monopiles, evaluated installation methods and tested actual energy absorption. The project overcame challenges to provide a high-strength, durable replacement that enhances safety, reduces maintenance cost, and service disruptions at the Ferry.

MERIT AWARD WINNERS

AECOM  
Routes 11, 220 & 220A Access Management Project at I-81, Exit 150  
AECOM designed an upgraded Routes 11, 220 and 220A intersection for VDOT. The pressure was relieved by dedicating a ramp from I-81 to reroute traffic away from this intersection. Route 460 traffic was also redirected by constructing Gateway Crossing. A roundabout at the end of the Exit 150B off-ramp completes this access management project, which resolved mobility, capacity, and safety issues.
CHA Consulting, Inc.
Abingdon Urban Trail
The Town of Abingdon, Virginia, pursued the development of a 1.6-mile urban trail through residential, commercial, and industrial environments, connecting the center of Abingdon with two of the country’s premier trails, the Virginia Creeper National Recreational Trail and the Overmountain Victory National Historic Trail. This trail provides a safe path to bike or walk on a designated path, economic and sustainable benefits to Abingdon businesses, and wellness and health benefits to residents and visitors. The incorporation of QR code technology encourages technically savvy populations to explore the trail, history, and region based on their personal interests.

Dewberry
Route 606 Loudoun County Parkway/Old Ox Road Widening & Reconstruction
The Route 606 corridor was and continues to be a heavily used corridor that has not seen improvements for more than 50 years. This project consisted of the widening and reconstruction of Route 606 from a 2-lane undivided to a 4-lane divided road for approximately 5.5 miles from Dulles West Boulevard to the Dulles Greenway. Major project elements included a new 2-span bridge carrying Route 606 over the Horsepen Dam auxiliary spillway; widening and raising of the Horsepen Dam embankment, extension of the principal spillway, realignment of the auxiliary spillway; nine new or modified traffic signals; a new access point to the National Oceanographic Atmospheric Administration (NOAA) weather facility; three new noise barriers; new pedestrian facilities; stormwater management facilities; and engineering design, environmental permitting, right-of-way acquisition oversight, and utility relocations.

JMT
South Boulevard Drainage Improvements
Virginia Beach
This sidewalk expansion addressed Virginia stormwater quality requirements. JMT noted that the project was in the same Hydrologic Unit Code (HUC) as three other sidewalk improvement projects and suggested over-designing the South Boulevard BMP so stormwater quality credits could apply to the other projects. JMT engineers delivered an innovative open-back storm drain inlet design, effectively discharging runoff collected in a roadway gutter underneath a sidewalk into a stormwater quality BMP. The combination of oversizing the BMP and the use of the open-back inlets created a water quality credit of 3.0 pounds to apply to other projects.
JMT
Masonic Lane Culvert Rehabilitation and Stream Stabilization, Henrico
This project began with the discovery of an oversight in the early 1970s with a 10' x 10' concrete reinforced box culvert not being included in the County's inventory of NBI structures. Over the years, the downstream channel had experienced erosive forces significant enough to threaten the integrity of the structure and the safety of the traveling public. JMT studied the project site, the many constraints on means and methods, defined the project challenges to be addressed, established project objectives, and generated a solution to meet the project’s requirements for success.

The Structures Group, Inc.
Woodhaven Assisted Living Facility, Williamsburg
The Structures Group, Inc. provided the structural consulting and design for the comprehensive renovations and additions to the Woodhaven Assisted Living Facility. This project included interior renovations, a 1-story addition, 2-story Memory Care and Adult Day Care Center, and a 4-story assisted living wing with a 2-story corridor attaching the wing to the existing Woodhaven Facility. With a “time of the essence” approach, the complex was completed three years ahead of schedule and $1.3 million below budget.

Whitman Requardt & Associates
Sedimentation Basin Improvements, Richmond
The Sedimentation Basin Improvements Project for the City of Richmond was a unique and challenging project. The existing residual collection and clarification equipment for the sedimentation basins required extensive maintenance, resulting in more frequent basin cleaning and reduced water treatment plant capacity. The implemented improvements are the culmination of significant study and design efforts in cooperation with the City of Richmond and Water Treatment Plant personnel. WRA performed thorough evaluations of the raw water and treatment processes at the Water Treatment Plant to facilitate the necessary improvements.