

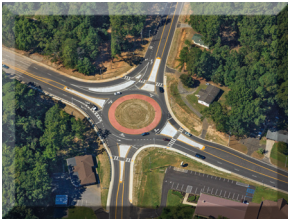
2017 Engineering Excellence Awards

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES
of South Carolina



2016



2014



2015

Tuesday
February 7, 2017
Columbia Museum of Art

ENGINEERING EXCELLENCE AWARDS

Engineering Excellence is an annual competition sponsored by the American Council of Engineering Companies (ACEC) and its member organizations. It recognizes engineering achievements which demonstrate the highest degree of merit and ingenuity.

The ACEC-SC Palmetto Award (top overall project) and the five other entries judged to be the best overall were eligible to enter the national competition. National winners are announced in April at a gala event in Washington, D.C.

The ACEC-SC competition is open to all firms engaged in the practice of consulting engineering. Projects must have been designed in the state of South Carolina with construction substantially completed between Nov. 1, 2014 and Oct. 31, 2016. Projects could have been constructed anywhere in the world as long as they were designed in South Carolina.

A distinguished panel of judges was selected. Each judge separately reviewed the projects. Criteria for judging included: original or innovative application of new or existing techniques; future value to the engineering profession and perception by the public; social, economic and sustainable design considerations; complexity; and exceeding owner/client needs.

We applaud and congratulate all the firms that entered the 2017 Engineering Excellence Awards Competition. Project panels will be displayed at locations throughout the state to increase public awareness of the important role consulting engineers have in our society.

PALMETTO AWARD



TranSystems Corporation

Charleston County Bees Ferry Road Widening

Charleston County

Transportation, \$500,000-\$2 Million

ACEC FINALIST · ENGINEERING EXCELLENCE AWARD

Bees Ferry Road in Charleston is a heavily trafficked corridor facing increased development and population growth, as well as flooding and drainage issues. The need to accommodate increased road and pedestrian traffic led to a road widening effort that also included water, sewer and utility improvements. By widening from



two lanes to four and six lanes in areas, the corridor is better equipped to handle the increase in development. Aiding both traffic flow and safety, the design modifications for the Bees Ferry Road and Savannah Highway intersection include a new signal, the removal of a dangerous skew angle by realigning to a 90-degree angle, adding dual left-turn lanes for eastbound travelers, and adding a free-flow right-turn lane for drivers traveling south toward Savannah. For pedestrians and cyclists, a 10-foot-wide multi-use path was installed on the west side of Bees Ferry Road. Also as part of the project, the bridge over the Church Creek Canal was replaced with a new longer, wider bridge complete with bicycle and pedestrian accommodations. Another goal of the project was to solve the road's frequent flooding and drainage issues. With the road widening, much of the corridor's sewer, water systems and utilities were moved adding complexity. By mitigating traffic interruption and working with multiple stakeholders, the new wider facility offers the community better connectivity and increased safety and access for pedestrians.

ACEC FINALISTS

F&ME Consultants, Inc.

SC 171 Bridges Over Folly Creek and Folly River
South Carolina Department of Transportation
Structural Systems, Over \$10 Million



ACEC FINALIST · ENGINEERING EXCELLENCE AWARD



With its high risk of seismic activity, South Carolina's coastal region often presents geotechnical challenges on transportation projects. One of these challenges is soil liquefaction, which results in the loss of soil strength in loose sands during a seismic event.

Faced with this challenge on the off-alignment replacement bridges on SC 171 over Folly River and Folly Creek in Charleston County, SCDOT's as-bid construction documents required deep soil mixing under the four bridge approach embankments to improve the project areas' liquefiable soils. However, because this is a specialized process installed by only a small number of contractors, competition was limited and the project bids came in higher than expected.

After SCDOT selected Cape Romain Contractors to construct the project, F&ME was hired to develop an alternative to the costly deep soil mixing method. As a value engineering effort with Cape Romain, F&ME designed a pile-supported embankment that consisted of a reinforced concrete slab founded on steel H-piles with vertical side walls. Local soil and stone were then used to form the embankment on top of the slab.

The pile-supported embankment was installed by Cape Romain without the need of a specialty contractor, which reduced the overall construction costs and allowed Cape Romain greater control of the work. F&ME's innovative value engineering design resulted in \$1.6 million in cost savings.

ICA Engineering dba HDR|ICA

Bluffton Parkway Phase 5A
Beaufort County
Transportation, Over \$10 Million



ACEC FINALIST · ENGINEERING EXCELLENCE AWARD



Beaufort County selected HDR|ICA to improve safety, efficiency, and reduce traffic of US 278 by 30% by performing design services to its final easternmost connection with the Bluffton Parkway. This vital corridor is the only access to Hilton Head Island and carries millions of visitors annually.

HDR|ICA was selected to perform engineering services for Phase 5A. The majority of this section of the Parkway is located on new alignment, primarily within an existing major utility corridor, and includes a complex new interchange

with US 278. The Parkway is comprised of two twelve-foot travel lanes in each direction, a 24-foot landscaped median and two eight-foot multi-use pathways. The interchange design consists of a curving, bifurcated bridge constructed through an environmentally sensitive tidal marsh with flyover segments tying in separately to the eastbound and westbound lanes of US 278.

Engineering services performed by HDR|ICA included roadway and bridge design, stormwater drainage design, pavement marking and signing, signal design, retaining/noise wall design, sediment and erosion control design, and geotechnical investigations and analysis. HDR|ICA also conducted extensive public involvement and completed the Environmental Assessment/ FONSI for Phase 5A. Final road and bridge plans for Phase 5A were complete in the spring of 2010 and construction was complete in the summer of 2016.

Infrastructure Consulting & Engineering, PLLC

US 176 Emergency Bridge Replacement over Cannons Creek
South Carolina Department of Transportation/United Infrastructure Group, Inc
Structural Systems, \$2 Million-\$10 Million



ACEC FINALIST · ENGINEERING EXCELLENCE AWARD



The October 2015 historic rainfall and flood event caused flash-flooding across much of southeast South Carolina. The event culminated when rivers overtopped their banks, impacting the area. The flood waters also damaged many of the area's roads and bridges causing significant traffic disruptions. The South Carolina Department of Transportation immediately began making emergency assessments of the state's infrastructure, closing numerous failed roads and bridges.

The US 176 bridge over Cannons Creek, constructed in 1949, collapsed when the middle interior frame was completely undermined because of the flood waters. Replacement of this bridge was crucial for the Newberry County community it served.

SCDOT issued a Request for Proposal for the Emergency Design-Build Replacement Project and awarded the contract to the Design-Build team of United Infrastructure Group, Inc. (UIG) and Infrastructure Consulting & Engineering, PLLC (ICE). The Design-Build team was selected because of providing the best solution at the most competitive price. Their proposal employed innovative design and construction solutions that met SCDOT's request for expedited design, review, approval and construction in 159 days. The SCDOT was pleased with both the design and construction of the replacement of the US 176 bridge over Cannons Creek. Not only did the UIG/ICE team meet budget requirements, they also completed the project 18 days ahead of schedule and opened the bridge to traffic on March 11, 2016.

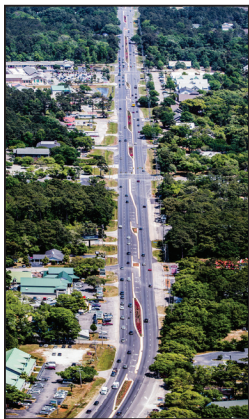
Stantec Consulting Services Inc.

US 17 Median Improvements
South Carolina Department of Transportation
Transportation, \$2 Million-\$10 Million



ACEC FINALIST · ENGINEERING EXCELLENCE AWARD

Stantec was selected by the South Carolina Department of Transportation to design improvements on US 17 Ocean Highway from S-22-46 Waverly Road northward to Baskerville Drive in Georgetown County. This 1.9-mile segment of US 17 was plagued with congestion and vehicular collisions. During the summer beach season, daily traffic averaged 39,000 vehicles per day peaking throughout the day and into the early evening. Delays occurred along the corridor itself, but also for vehicles attempting to enter US 17.



US 17 had five lanes total, with two through lanes in each direction and a continuous two-way left-turn lane. It had 25 intersections and numerous driveways within the project limits. Its five-lane typical section provided extensive access points, but it also conflicted with the high traffic volumes that had developed over time. US 17 had outgrown its existing five-lane section and needed improvements.

Stantec and SCDOT collaborated to develop the best option for improving US 17 while addressing the needs and concerns of both the overall public and adjacent property owners. Stantec developed plans to convert the existing two-way left-turn lane into a raised landscaped median. Side street approaches were designed to restrict turning movements, which varied for each approach. Median openings and new traffic signals were strategically placed to accommodate traffic flow patterns. The project was designed to improve safety by reducing the conflicting vehicular movements and maximize the viability of its existing four through lanes without impacting adjacent properties. This project was also one of the first corridors in South Carolina to implement adaptive traffic signal control, which was especially beneficial given the tourism related traffic on the corridor.

Vaughn & Melton Consulting Engineers, Inc.

Eastern Band of Cherokee Indian Wastewater Treatment Plant Expansion
Eastern Band of Cherokee Indians
Water and Stormwater, Over \$10 Million



ACEC FINALIST · ENGINEERING EXCELLENCE AWARD



The Eastern Band of Cherokee Indians has a clear vision for their Tribe's future. Their vision included an essential upgrade to the existing wastewater treatment plant to allow for more use. Although increasing capacity in existing WWTP's is becoming more common, this project represents the uncommon. Cherokee is uncommon in their rural location, as a sovereign governmental entity, and their need for their infrastructure to be reliable (since no one else will come fix it for them!). As part of their cultural heritage, they also have an uncommon desire to protect the environment.

Vaughn & Melton Consulting Engineers (V&M) helped the Tribe achieve this huge undertaking by thinking of uncommon project components as design strengths. Since the EBCI didn't have additional land available for the upgrade, V&M designed it within a tight, five-acre location six weeks ahead of schedule. EBCI wanted to reuse their existing structures to save money so they were repurposed and a bio-solids facility was built enabling the community to use the byproduct for agricultural uses. EBCI's requirement to keep the existing WWTP in use during construction was achieved along with making it better and safer for the people who work there. The EBCI wanted to protect a great recreational and fishing river so the discharge water was designed to be cleaner than the river and to exceed environmental requirements.

ENGINEERING EXCELLENCE AWARDS

GWA, Inc.

Columbia Farms Hatchery

Columbia Farms

Building/Technology Systems, \$500,000-\$2 Million

SMALL FIRM AWARD AND ENGINEERING EXCELLENCE AWARD



The 63,000 sq.ft. Columbia Farms Hatchery constructed in Monetta utilizes innovative, modular hatchery equipment and is the first of its kind in North America. The new equipment allows production of roughly one million quality chicks per week that go directly to House of Raeford's growers in the local community.

GWA was tasked with coordinating electrical services which included working closely with the equipment manufacturer in the Netherlands. GWA's scope included utility distribution, site design, emergency power system, grounding, lightning protection, lighting, fire alarm, security, access controls, lightning protection and communications infrastructure design.

Routine intensive cleaning and disinfection results in an environment requiring IP66 ratings for all materials and equipment. The wet environment generates the need for all building metal to be bonded together, and then bonded to the building main electrical grounding system.

Since much of the facility is automated, lighting is required for a limited time in many areas so lighting control was a priority. LED lighting and occupancy sensors were specified with a special sensor enclosure fabricated for the sensor assembly.

The total construction cost of this project is \$8.9 million. Expected to provide growth and revenue to the local Aiken County economy of nearly \$3 million over a 20-year period, the hatchery has already been identified by other growers in the Southeast as the model to use in planning their next facilities.

Davis & Floyd, Inc.

Greenwood Uptown Market

City of Greenwood

Special Projects, \$2 Million-\$10 Million

ENGINEERING EXCELLENCE AWARD



Davis & Floyd, Inc. worked with the City of Greenwood to develop the 6,000-square-foot Greenwood Uptown Market, a vibrant recreational facility that encourages the community to come together for produce market days, concerts, parties, and festivals as well as play in the greenspace and 3,000-square-foot interactive water feature. This special project uniquely blends commerce with recreation and beauty with function. Its design accomplishes Uptown Market's vision, which includes the

following goals:

- Promote increased consumption of local and organic produce with education and outreach,
- Support local farmers and encourage their growth and transition to sustainable and organic practices,
- Foster ties among the farmers, community, and local businesses, and
- Enhance the local economy by providing a vibrant additional destination to Uptown Greenwood.

The project enriches the City of Greenwood's Center of the Arts District, promoting economic activity, increasing the quality of life for Greenwood County residents, and encouraging families to support local farmers, crafters, and vendors. Uptown Market serves as a prototype for those interested in following the same path to breathe new life into a community.

Infrastructure Consulting & Engineering, PLLC (ICE)

Perryclear Bridge Replacement

Beaufort County

Small Projects, \$500,000-\$2 Million

ENGINEERING EXCELLENCE AWARD



Constructed in 1965, this 140-foot timber-pile bridge over Mulligan Creek had undergone replacement and repair of its structural support timbers on two occasions over the years. When an annual South Carolina Department of Transportation inspection report recommended reducing the safe load capacity of the bridge to 10 tons, Beaufort County Council identified replacement of the bridge as a key project.

The bridge serves the Perryclear Community in the Grays Hill area adjacent to the Marine Corps Air Station. As this route is the sole means of transit for approximately 36 property owners,

access had to be provided during construction with a single-lane of traffic kept open at all times. Beaufort County wanted a bridge that required little or no maintenance, kept construction inside the right of way and had little or no effect on the environment.

The Design-Build team of United Infrastructure Group and Infrastructure Consulting & Engineering (ICE) was selected upon providing the best solution at the most competitive price with their proposal to replace the existing bridge with a two-span structure, 140 feet long and 27 feet wide, SCDOT Bridge Maintenance Pre-Stressed Concrete-Voided Box-Standard Bridge. This design alternate resulted in six value engineering ideas that reduced the contract price by \$173,000 for Beaufort County. The bridge was completed within the allotted time and exceeded the owner's expectations.

Life Cycle Engineering

CyberAssess™

Life Cycle Engineering

Building/Technology Systems, \$0-\$500,000

ENGINEERING EXCELLENCE AWARD



A recently issued (June 2015) Federal Acquisition Regulations mandate requires that all companies participating in federal programs meet compliance standards included in the National Institute of Standards and Technology Special Publication (SP) 800-171. In its SP 800-171, NIST requires all companies handling controlled unclassified information to complete an audit showing the status of their compliance with NIST 800-171 and report to the Department of Defense Chief Information Officer within 30 days of a contract award. Many companies lack the internal resource knowledge or bandwidth necessary to ensure timely compliance.

Solution:

Life Cycle Engineering's solution to the problem is CyberAssess, an easy-to-use online tool that addresses the needs of companies lacking the resources or knowhow to decipher the complex security requirements from the NIST SP 800-171. Our tool demystifies requirements by using simplified questions to gather information. The information is consolidated to provide a visual overview of any gaps in a company's compliance and an

audit report is generated as required for submission to the DoD CIO. The initial release of CyberAssess was designed to meet the minimal audit compliance requirement for the NIST SP 800-171. Future releases will include additional compliance solutions to meet evolving industry needs.

Michael Baker International

I-20 Sound Barrier Wall

South Carolina Department of Transportation

Environmental, Over \$10 Million

ENGINEERING EXCELLENCE AWARD



The Interstate 20 Sound Wall Project in Richland County was a solid project, benefiting the residents, businesses and the traveling public, while meeting an accelerated schedule in an effort to not impact the letting schedule of the widening project. This corridor of Interstate 20 is known for its noise so it was no surprise that the public brought forth concerns about the impact the widening project would have on the noise levels during the public involvement process. To address this concern over 32,400 linear feet of sound barrier wall was engineered with a unique set of wall standards utilizing other states' standards since the SCDOT

didn't have standards. In addition, the available right of way and environment concerns associated with the stream crossings also caused challenges resulting in the use of guardrail and concrete barriers to protect the motorists as the sound barrier wall was located within the clear zone.

Michael Baker International

Waterfront/Little Creek Road Paving

Kershaw County

Special Projects, \$500,000-2 Million

ENGINEERING EXCELLENCE AWARD



The Waterfront/Little Creek Road Paving Project in Kershaw County was truly a significant project for the residents. This roadway had a high accident rate and after a fatality the residents demanded improvements. The residents also suffered from Waterfront/Little Creek Road overtopping the roadway during major rain events, hindering access to properties as Waterfront/Little Creek Road provided the only access. To address the deficiencies, replacement of an existing undersized 48" corrugated metal pipe with a double 8' by 8' box culvert, installation of guardrail, and paving of approximately 4,350 linear feet of unpaved road was

completed. Due to high construction costs for staging the box culvert construction, complete road closure was required. It was determined that the most cost-effective solution was to obtain an easement from an undeveloped parcel to provide a temporary road from the adjacent street for residents to access their properties on Waterfront/Little Creek Road.

Stantec Consulting Services Inc.

US 278 Road Safety Audit

South Carolina Department of Transportation

Studies, Research and Consulting Engineering Services, \$0-\$500,000

ENGINEERING EXCELLENCE AWARD



US 278, in Beaufort County, is a high crash major arterial, with over 50,000 vehicles a day providing access to Hilton Head Island. To identify any existing hazards, the South Carolina Department of Transportation engaged Stantec as the consultant to lead a Road Safety Audit for a 15-mile section of this roadway. SCDOT has conducted Road Safety Audits in the past, but only recently used the services of a consultant to manage the RSA process. Stantec was chosen to lead the first consultant RSA due to their complete understanding of the process the Department desired, the practicality of the effort needed, and the need for the process to be completed quickly. The crash data provided

for this review included a spreadsheet with critical information that identified the location, date, time, injuries, and other information about the crash. There were almost 2,200 crashes listed. This would have been an enormous time consuming process to locate these crashes and to identify hazards and recommend solutions if the GIS process that Stantec developed had not been used. The process to plot the crashes on Google Earth aerials was highly efficient resulting in minimal labor hours to develop and prepare aerial documents for the team's use in the field review. This process became the standard for other consultants to use in plotting crashes for other RSAs.

STATE FINALIST

STV

Fort Mill Southern Bypass

York County

Transportation, Over \$10 Million



The 4.3-mile Fort Mill Southern Bypass is essential to the future growth of eastern York County. It provides a necessary alternate route around the highly congested Fort Mill central business district providing a seamless east-west link between SC 160 and Interstate 77 while also helping to restore the downtown character of Fort Mill by reducing traffic by at least 50 percent. The \$58 million project was completed on schedule in four separate phases and represents the county's largest undertaking using its "Pennies for Progress" program funded through a one-cent sales tax approved by local voters in 2003. STV worked with York County and multiple stakeholders since the earliest stages of the project and performed an array of design and construction management services, including the plans for a new 476-foot bridge over an active railway and local roads as well as preserving an endangered wild sunflower indigenous to the local area.

Judges

A special thank you is extended to the competition judges who volunteered valuable time to carefully review each project.

Joey Derby, P.E.

Lexington County Engineer

Robert W. King, Jr., P.E.

Retired, Former Deputy Commissioner, SC DHEC

Mary Katherine Watson, PhD

Assistant Professor

Civil and Environmental Engineering, The Citadel

American Council of Engineering Companies of South Carolina (ACEC-SC) is a member organization of the American Council of Engineering Companies. For information on ACEC-SC or the Engineering Excellence Awards competition, please contact us at

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