Maintaining the assets that are critical to your mission.

Challenged with tightened resources, increasing maintenance costs and aging facilities, our clients rely on us to provide the expertise and experience required to unlock the value of their assets.

Whether facing operational, environmental or compliance-related challenges, Wood goes a step beyond to optimize performance, reduce risk and maximize value over the life cycle of your facility.

With experience providing BUILDER™ services for facilities totaling roughly 600 million SF, we are proud to manage the U.S. Army Corps of Engineers’ infrastructure by performing accurate facility condition assessments around the world. At the United States Military Academy at West Point, we’re helping to assess and sustain the historic building infrastructure to shape the future for tomorrow’s leaders. In the Asia Pacific, we are supporting the U.S. Marine Corps by inspecting and assessing more than 2,600 facilities on bases across Japan, Korea and Hawaii.

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Enhancing Industry-Government Engagement

Thanks for all you are doing to support SAME and serve our nation. As we move towards our Centennial in 2020 and set the strategic direction for the start of our second century, five lines of effort have emerged that our members, Posts and partners are most passionate about and where our contributions will have a direct impact on national security. Last issue, we looked at how SAME is "Producing STEM Professionals for the Nation." This time, with the SAME Federal Small Business Conference front and center this fall, I want to focus on "Enhancing Industry-Government Engagement" and the critical work that we do for every level of government to bring the best military, public, private and academic minds together to discuss and solve infrastructure-related challenges for our country.

The impact of our efforts to lead collaboration is not only facilitating solutions, but getting the most out of public resources to serve our national security interests! SAME was born out of the recognition that military and government engineers need the technical expertise and project delivery experience of the private sector in order to succeed in peace and war. That remains true today.

Our all-important role in leading collaboration centers on three main outcomes: facilitating dialogue, building trust, and developing creative solutions. The tremendous work of our Project Partnering Task Force is a prime example of all three. By bringing together the Office of the Secretary of Defense, the military services, industry leaders, and many strategic partners, we produced results that are now being employed in the field. The role we played in assisting the Department of Veterans Affairs and Small Business Administration achieve the requirement they were given in the 2017 National Defense Authorization Act to develop a single process for certifying service-disabled veteran-owned businesses is another example of how we are living our mission. And most recently, the 2018 Federal Small Business Conference, co-located with the Department of Veterans Affairs' National Veterans Small Business Engagement is a huge step toward our goal of hosting a single, national small business event that provides industry and government the opportunity to conduct valuable market research, and an opportunity for senior executives to collaborate across agency lines and find ways to standardize their approach, making it easier for the private sector to deliver.

WORKING TOWARDS SOLUTIONS
Nationally and locally, there are many ways that our members can do "Just One More" to enhance industry-government engagement.

- Help your local government or military agency solve a challenge by hosting or participating in an IGE Workshop (learn more at www.same.org/ige).
- Participate in our national CEO Roundtable, generally held as part of the Small Business Conference (the topic this year is Category Management).
- Participate in the Table Top Exercise hosted by the Joint Engineer Contingency Operations Committee at our annual Joint Engineer Training Conference.
- Participate in Industry Days and Forums hosted by SAME Posts or other agencies or associations.
- Invite SAME strategic partners to join your Post's events and encourage them to collaborate locally (learn more at www.same.org/partnerships).

The opportunities to enhance "IGE" are endless; and most importantly, your contributions are multi-fold—benefiting our profession, our people, our communities, and our nation. We are making a positive difference!

Col. Marvin Fisher, LEED AP, F.SAME, USAF (Ret.)
SAME President 2018-2019
Together. **We can.**

Imagine a team that is dedicated to helping you tackle your toughest challenges.

Imagine an organization that sees every hurdle as another opportunity to deliver beyond expectation.

Imagine a partner that’s been at the forefront of the U.S. military mission for more than a century.

For more than 100 years, AECOM has been working shoulder-to-shoulder with the U.S. Department of Defense to help make the world more secure. Whether leading a project at a single site or managing complex programs around the world, our approach is always collaborative, innovative, and transformative. No matter the challenge, we stand ready to help you deliver mission success.

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CORRECTION:

In the March-April 2018 issue, the photo on page 55 in the article "Power & Presence: Enhancing Energy Security in the Pacific" was misattributed. The photographer should be P. Robinson, Missile Defense Agency.
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As we close in on the end of 2018, we are now fully immersed in the Run to 2020 and making progress on our number one goal: to increase member participation! This fall has been exciting across the Society as we develop the organizational infrastructure to lead us into our second century of service.

Run to 2020 and Beyond. Phase One of our three-year Centennial Celebration is underway and I am happy to report that the Chair of the Centennial Planning Task Force has been named: Capt. Bob Bevins, P.E., F.SAME, USCG. Bob, thanks for volunteering to take on this once in a lifetime opportunity! He has agreed to lead the effort for the next three years, as we move into Phase Two (the 2020 JETC in Washington, D.C.) and Phase Three (the Post/Regional Celebrations taking place from May 2020-May 2021).

Co-Location of SBC/NVSBE. The SAME Federal Small Business Conference (SBC) is taking off as the one-stop market research event for the federal government and the A/E/C industry. A big step in this journey is that the 2018 SBC, being held Oct. 31-Nov. 2 in New Orleans, has been co-located with the Department of Veterans Affairs’ National Veterans Small Business Engagement (NVSBE). Unlike past years, where NVSBE was focused on several communities of interest, including medical supply and information technology, this year, the department has focused its entire participation on the A/E/C community. That is translating into over 200 procurement decision-makers from its construction and facility maintenance offices attending the co-located events.

2025 SAME Strategic Plan. Our Society-wide focus over the last three years of driving what we do by the 2020 SAME Strategic Plan has allowed us to identify the key areas where we need to continue to make an impact into our next century to support our nation. Thanks to the diligence of the National Board of Direction and Post leaders, the lines of effort that have evolved portray an exciting path for many years to come. The board is beginning the development of the next strategic plan and we will launch a concerted effort to gather Post and individual member input.

National Governance & Management Review. As a result of the many disciplined yet focused procedures we now have in place, along with tremendous teamwork between the National Office and the Board of Direction, we were able to conduct a very thorough National Governance & Management Review with the Executive Committee in August. Fundamentally, the review enabled the Executive Committee to ensure that we are postured as a professional society in every way as we continue pursuing our vision of being recognized as the leading integrator for the A/E/C profession.

Industry-Government Engagement. The Project Partnering Task Force we established has produced magnificent results in record time after being constituted last December after the CEO Roundtable. Some of its key recommendations are already being implemented on federal projects. The intent of the task force was to find ways to open the dialogue between private contractors and government clients by rediscovering the benefits of teamwork and transparency at the project delivery team level!

SUPPORTING THE SOCIETY
We are always looking for better ways to support you, our members, our partners, and our stakeholders, as we strive to remain One Society of vibrant Posts that serve their local communities while contributing to a common national direction.

Thanks to each of you for your commitment to our nation, our profession, and to SAME.

SAME Executive Director
Maj. Scotty Austin, USA, Commander, Task Force Recovery (center) assesses the removal of deteriorated hardwood material in Humacao, PR, Sept. 22, 2018.

The U.S. Army Corps of Engineers has led efforts to haul 4.4-million-yd³ of debris from the island as part of the Hurricane Maria response efforts.
Lance Cpl. Brett Schow, USMC, Combat Engineer with 1st Platoon, Bravo Company, 9th Engineer Support Battalion, 3rd Marine Logistics Group, fires an M16 rifle during a night fire range at Camp Hansen, Okinawa, Japan, Sept. 26, 2018. The training was part of the unit’s Combat Marksmanship Program to improve the engineers’ tactical warfighting abilities on the battlefield. U.S. MARINE CORPS PHOTO BY PFC. MARK FIKE
Members of 147th Civil Engineer Squadron participate in the Silver Flag training exercise, hosted by the 435th Construction and Training Squadron in September at Ramstein AB, Germany. Silver Flag is a vital training exercise that allows military members to practice bare base beddown, bomb-damaged runway repair, disposing of explosive ordnances, and other tasks during simulated wartime operations. AIR NATIONAL GUARD PHOTO BY STAFF Sgt. DANIEL J. MARTINEZ
REPORT EXAMINES INDUSTRIAL BASE

Deputy Secretary of Defense Pat Shanahan in October presented a new report, “Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States,” to President Trump, pursuant to Executive Order 13806.

President Trump directed Defense Secretary James Mattis to lead a whole-of-government effort to identify and assess risks in the manufacturing and defense industrial base. Based on this review, the secretary made recommendations to ensure a robust, resilient, secure, and ready manufacturing and defense industrial base.

The recommendations outlined reflect the administration’s commitment to securing the industrial capabilities of the United States, demonstrating their vital role to not only the nation’s economic security, but to national security as well. The action that followed the executive order included a multi-agency risk assessment of the industrial base of the United States, which involved experts from the Departments of Defense, Commerce, Labor, Energy, Homeland Security, and other agencies and offices.

The report provides recommendations to address immediate risks identified in the manufacturing and defense industrial base and initiates follow-on efforts to create a strategy for building this base for next-generation technologies.

For more information, visit www.defense.gov/strengtheningdefenseindustrialbase.

(Contributed by DOD)

BEGINNING YEAR WITH FUNDING

For the first time in more than a decade, the Department of Defense (DOD) has been able to start a fiscal year with an enacted appropriation instead of operating under a continuing resolution.

Of the $716 billion defense funding for FY2019, which includes DOD and other non-DOD defense entities, such as the Department of Energy, $686 billion is allocated for DOD.

This appropriation directly supports the three main lines of effort in the 2018 National Defense Strategy:

- Restoring readiness and building a more lethal force;
- Strengthening existing alliances while building new partnerships abroad;
- Reforming and modernizing the department for greater affordability, accountability and performance.


(Contributed by DOD)

NEW CYBER STRATEGY RELEASED

In September, the White House released the nation’s first new cyber strategy in 15 years, which highlights the critical and growing threat that malicious cyber actors pose to U.S. national security.

Said DOD officials in a statement: “The Defense Department stands ready, as part of the synchronized whole-of-government
We are better together

We actively engage, seek, and support those who have served our nation, because they understand the sacrifice required to help our communities prosper. For more information on opportunities with Stantec, visit veterans.stantec.jobs.

To learn more about our US Federal program, visit stantec.com/usfederal
approach articulated in the National Cyber Strategy, to preserve peace through strength by identifying, countering, disrupting, degrading and deterring behavior in cyberspace that is destabilizing and contrary to U.S. national interests.”

Officials said the National Cyber Strategy will address several key actions to protect America’s networks.

The federal government was the chief source of external funding for R&D across all industries, accounting for $24 billion of the $57 billion of external funding.

**Protecting the People, Homeland, Way of Life.** The new cyber strategy notes that pursuing the objectives of the first pillar will require the U.S. government, private industry and the public to take immediate and decisive actions to strengthen cybersecurity, with each working on securing the networks under their control and supporting each other as appropriate. For the government’s part in that effort, the administration will act to further enable the Department of Homeland Security to secure federal networks, with the exception of national security systems and Defense Department and Intelligence Community systems.

**Promoting American Prosperity.** The strategy’s second pillar seeks to preserve U.S. influence in the technological ecosystem and the development of cyberspace as an open engine of economic growth, innovation and efficiency. To enhance the resilience of cyberspace, the administration expects the technology marketplace to support and reward the continuous development, adoption and evolution of innovative security technologies and processes and will work across stakeholder groups, including the private sector and civil society, to promote best practices and develop strategies to overcome market barriers to the adoption of secure technologies.

**Preserving Peace Through Strength.** As part of the third pillar, cyberspace will no longer be treated as a separate category of policy or activity disjointed from other elements of national power. The United States will integrate the employment of cyber options across every element of national power to identify, counter, disrupt, degrade and deter behavior in cyberspace that is destabilizing and contrary to national interests, while preserving United States overmatch in and through cyberspace.

**Advancing American Influence.** In outlining its fourth pillar, the cyber strategy says the world looks to the United States, where much of the innovation for today’s internet originated, for leadership on a vast range of transnational cyber issues. The United States will maintain an active international leadership posture to advance American influence and to address an expanding array of threats and challenges to its interests in cyberspace. Collaboration with allies and partners is part of this pillar, which the new strategy says is essential to ensuring continued benefit from cross-border communications, content creation and commerce generated by the internet’s open, interoperable architecture.

(Contributed by Terri Moon Cronk, Defense Media Activity)

**NATIONAL R&D EXPENDITURES**

According to a report issued in October from the National Science Foundation, National Center for Science & Engineering Statistics, and the U.S. Census Bureau, businesses spent a total of $375 billion on research and development (R&D) in the United States in 2016, an increase of 5.3 percent from 2015. Funding from companies’ own sources was $318 billion, an increase of 7 percent. Funding from other sources was $57 billion in 2016 and $59 billion in 2015.

Of the $375 billion spent on R&D in 2016, $25 billion (7 percent) was spent on basic research, $61 billion (16 percent) on applied research, and $289 billion (77 percent) on development, a similar distribution to spending in 2015.

The federal government was the chief source of external funding for R&D across all industries, accounting for $24 billion of the $57 billion of external funding. Next were foreign companies ($18 billion) and other U.S. companies ($14 billion).
Most of the federal funding came from the Department of Defense ($16 billion). Of all federal funding, 92 percent went toward aerospace products and parts ($13 billion), professional, scientific and technical services ($5 billion), and computer and electronic products ($4 billion).

Companies with 250 to 24,999 domestic employees performed 53 percent of the nation’s total business R&D. The largest companies (those with 25,000 or more domestic employees) performed 36 percent of the nation’s total business R&D. They employed 46 percent of those who worked for R&D-performing or R&D-funding companies and employed 26 percent of R&D employees in the United States. Micro-, small- and medium-sized companies (those with five to 249 domestic employees) performed 11 percent in 2016.

Business R&D is concentrated in a relatively small number of states, with California leading the way at 33 percent.

(Contributed by NSF)

**LEADERS DISCUSS DEFENSE STRATEGY**

DOD leaders recently participated in a Defense News Conference to discuss the 2018 National Defense Strategy and how the military is evolving as it responds to global power competition.


Takeaways from the day-long event addressed a number of specific ongoing and future-looking actions.

- The Navy must be ready to compete in all arenas of global threats against near-peer competitors such as Russia and China, both of which have growing capabilities.
- DOD readiness ensures it has more tools today than it has had in the past, which allows the services to provide training that is rigorous and realistic—and most importantly, that today’s training ensures mastery of skills.
- A tenet of DOD training is to ensure the services can train and fight with partners and allies.
- Squadrons are the power base of the Air Force. They are the guts, brains and clenched fist of American resolve, and comprise how the Air Force competes, deters and wins.
- Industrial-base collaboration with U.S. partners and allies is an important diplomatic tool for DOD.
- A critical part of the National Defense Strategy effort to reform business practices is the priority to get capabilities in the hands of servicemembers downrange quickly.

(Contributed by Terri Moon Cronk, Defense Media Activity)
SAME MEMBER NEWS

Capt. John Barresi, P.E., USCG, was named Commander, Coast Guard Facilities Design & Construction Center.

Col. Aaron Barta, PMP, USA, was named Commander, USACE Los Angeles District.

Capt. Chad Brooks, P.E., CEC, USN, was named Commander, USACE Albuquerque District.

Col. Kevin Brown, P.E., USA, has been named Deputy Commander, USACE Southwestern Division.

Lt. Col. Larry Caswell Jr., P.E., USA, was named Commander, USACE Albuquerque District.

Col. Edward Chamberlayne, Ph.D., P.E., USA (Ret.), has joined Louis Berger as Vice President for Program and Construction Services in the firm’s Washington, D.C., office.

Maj. James Covington, USA, has joined Dewberry on a one-year rotational Training with Industry Program.

Debra Crafter has joined Leo A Daly to lead small business engagement for the firm.

Lt. Col. Christian Dietz, P.E., USA, was named Commander, USACE Walla Walla District.

Capt. Patrick Dugan, P.E., USCG, was named Commander, Office of Civil Engineering, HQ Coast Guard.

Col. Jason Evers, P.E., USA, was named Commander, USACE Huntington District.

Cdr. Joshua Fant, P.E., USCG, was named Commander, Civil Engineering Unit Oakland.

Lisa Forrest has joined Weston Solutions as Vice President of Federal Growth Programs in the firm’s Washington, D.C., office.

Kenneth Frische has joined HDR as the Director of Cybersecurity Services.

Cdr. Jeremy Hall, P.E., USCG, was named Commander, Civil Engineering Unit Cleveland.

Brig. Gen. Peter Helmlinger, P.E., USA, has been named Commander, USACE Northwestern Division.

Col. Dan Hibern, PMP, USA, was named Commander, USACE Savannah District.

Michael Huffstetler, Assoc. AIA, LEED AP, has been named Corporate Director of Federal Programs, Leo A Daly.

Col. Jason Kelly, PMP, USA, was named Commander, USACE Transatlantic Afghanistan District.

Cdr. Michael Kicklighter, P.E., USCG, was named Commander, Civil Engineering Unit Miami.

Col. Patrick Kinsman, P.E., USA, was named Commander, USACE Norfolk District.

Col. John Litz, PMP, USA, was named Commander, USACE Baltimore District.

Michael McGuinn, AIA, NCARB, LEED AP, has been promoted to Partner with Zyscovich Architects.

Nichole McGuire has joined Quinn Evans Architects as Marketing Manager in its Baltimore office.

Capt. Michael Monreal, P.E., CEC, USN, was named Commander, NAVFAC Southeast.

Capt. Steven Osgood, P.E., USCG, was named Commander, Civil Engineering Unit Oakland.

Col. Ken Reed, PMP, USA, was named Commander, USACE Fort Worth District.

Lt. Col. Kathryn Sanborn, P.E., USA, was named Commander, USACE Honolulu District.

Col. Steve Satttinger, USA, was named Commander, USACE Rock Island District.

Capt. Michael Saum, P.E., CEC, USN, was named Commander, Naval Facilities Engineering & Expeditionary Warfare Center.

Leslie Shepherd, FAIA, has joined Leo A Daly to lead the firm’s General Services Administration Market Sector.

Matthew Taylor was promoted to Principal with GZA GeoEnvironmental in its Metro Boston/Norwood office.

Capt. Daniel Turner, P.E., CEC, USA, has been named Commander, NAVFAC Mariana Islands.

Timothy Wall, Chairman & CEO, CDW Smith, was honored with the Alumni Professional Leadership Award from Wentworth Institute of Technology.

Rear Adm. John Korka, P.E., CEC, USN, became Commander, Naval Facilities Engineering Command, and Chief of Civil Engineers in October, with additional duty as Commander for Facilities and Environment, Navy Installations Command; and Deputy Commander for Facilities and Environment, Marine Corps Installations Command. Adm. Korka previously served as Commander, NAVFAC Pacific. A 1986 graduate of Old Dominion University, he first became a member of SAME in 2006. In 1997, he was awarded the SAME Morell Medal for outstanding contributions to military engineering by a member of the Civil Engineers Corps. Adm. Korka holds master’s degrees in Civil Engineering from Pennsylvania State University and in National Strategy Resources from the Industrial College of the Armed Forces.

ACQUISITIONS & EXPANSIONS

Ameresco acquired Chelsea Group Ltd., a building science and design engineering consulting firm.

Barr Engineering Company acquired Sage Environmental, a consulting firm based in Salt Lake City.

Buchart Horn Architects acquired Pittsburgh-based Celli-Flynn Brennan Architects and Planners.

Century Engineering acquired Interstate Acquisition Services, a right-of-way consulting firm with offices in Pennsylvania.

Dewberry acquired J3 Engineering Consultants Inc.

Gannett Fleming acquired KEH & Associates, a water and wastewater engineering firm.

Goodwyn Mills Cawood acquired SaltoCo, an architectural and planning firm.

HDR acquired David Ford Consulting Engineering, which specializes in water-related services.

IMEG Corp. acquired Colorado-based MKK Consulting Engineers.

McKim & Creed acquired Pittsburgh-based Loftus Engineers.

NV5 acquired infrastructure and transportation firm CALYX Engineers and Consultants, based in Cary, N.C.

Stantec announced plans to acquire Peter Brett Associates and True Grit Engineering.

Timmons Group acquired E.T. Hyman Surveying and OBS Landscape Architects.

CONTRACTS & AWARDS

AECOM was awarded a $24 million firm-fixed-price contract by USACE San Francisco District for A-E services.

The firm also was awarded a $48 million firm-fixed-price contract by USACE Jacksonville District to provide quality-assurance services in support of the agency’s Civil Works projects.

American International Contractors and AECOM are two of four firms that will compete for each order of a $38 million firm-fixed-price contract issued by USACE Middle East District for design-build, construction, site-adapt construction, and renovations and repairs projects.

Aptim Federal Services was awarded a $27 million firm contract by USACE Baltimore District for A-E hazardous,
You command better results when your building is as smart as your strategy.

Creating perfect places to achieve your mission. That’s Ingenuity for life.

Infrastructure can play a decisive role in your mission. You need to support personnel with a secure, comfortable, and energy-resilient environment that’s also sustainable and fiscally responsible. We’ll show you how. Our building technologies and infrastructure strategies create ideal environments for personnel to focus on and achieve the mission at hand.
toxic, and radioactive waste and military munitions remediation services.

Architects Pacific was awarded a maximum $15 million IDIQ A-E contract for design, engineering, specification writing, cost estimating, and related services at various locations within NAVFAC Hawaii.

Ashford Leebcor Enterprises was awarded a $25 million firm-fixed-price contract by USACE Norfolk District that provides for a variety of renovation, repair and minor construction services.

Benham Mead & Hunt JV was awarded an IDIQ contract under a shared $50 million pool to provide A-E services to Air Force Reserve Command locations across the United States.

Bryan Construction has been awarded a $14.8 million firm-fixed-price contract by USACE Kansas City District to construct a new combat arms facility at McConnell AFB, Kan.

Bryan International LLC was awarded a $148.5 million contract by USACE Europe District as part of the addition of construction companies to the Israel Multiple Award Task Order Contract.

Burns & McDonnell was awarded a $40 million IDIQ A-E contract to replace 40 underground storage tanks at Naval Base Kitsap, Wash., with six new, above-ground tanks that are environmentally compliant.

Cherokee Nation Management & Consulting was awarded a $22 million IDIQ contract for civil engineering support services at Eglin AFB, Fla.

Dewberry has been selected by the U.S. Army Engineering & Support Center, Huntsville, for a $45 million contract to provide A-E services in support of the Utility Monitoring & Control Systems Program, Electronic Security Systems Program, and Army Metering Program, and related building systems for Department of Defense and federal civilian agencies worldwide.

Doyon Project Services and Ocean Construction Services are among those firms awarded a $95 million IDIQ, multiple award, design-build, design-bid-build contract for waterfront construction projects within NAVFAC Mid-Atlantic.

Eco & Associates Inc. has been awarded a $9.8 million firm-fixed-price contract by USACE Los Angeles District for construction management of large-scale
Department of Veterans Affairs projects throughout California.  

EMCOR Government Services and VW International are among those firms that will compete for each order of a $475 million firm-fixed-price contract to support operations and maintenance, incidental repair and minor construction at U.S. Army Medical Command facilities.  

Fluor Corp. announced that the Department of Energy has exercised a $2 billion option to extend the company’s current management and operating contract of the Strategic Petroleum Reserve through March 31, 2024.  

GHD, in a joint venture with Setiadi Architects and Kaula AE, was awarded a maximum $40 million IDIQ A-E contract to support base infrastructure projects at various government facilities within NAVFAC Pacific.  

Gilbane Federal was awarded a $23 million firm-fixed-price contract for repair of Allen Hall at Fort Gordon, Ga.  

GSI Pacific, Silver Mountain Construction and WHH Nisqually Federal Services are three of six firms that have been awarded a combined $99 million IDIQ multiple award contract for design-build or design-bid-build construction projects located within NAVFAC Northwest.  

Grunley Construction was awarded a $26 million firm-fixed-price contract to design and construct an Operational Archives & Research Facility at the Washington Navy Yard, Washington, D.C.  

Guidon-CMTA JV and Miller-Remick are among those firms that will compete for each order of a $45 million firm-fixed-price contract for A-E services in support of the Facilities Modernization Program for the U.S. Army Medical Command, and other customers of the U.S. Army Corps of Engineers that may have healthcare facility needs.  

Hawaiian Rock Products was awarded a maximum $90 million IDIQ contract by NAVFAC Marianas for airfield paving construction services in Guam.  

HDR, Wood-Zapata JV, Benham Mead & Hunt JV, Farnsworth Group in a joint venture with Blair Remy, and Leo A Daly in a joint venture with BTA, were awarded a combined $50 million IDIQ contract to provide facilities A-E services to Headquarters Air Force Reserve Command.  

Heflter Contracting Group was awarded a maximum $15 million IDIQ contract for HVAC alterations, renovations and repair projects at Naval Base San Diego.  

Hensel Phelps was awarded a $143.2 million firm-fixed-price contract by USACE Fort Worth District for the Bureau of Engraving & Printing Western Currency facility expansion project.  

HHI was awarded an $18.9 million firm-fixed-price contract to build an ammunition inspection repair and repacking facility, ammunition storehouse, earth-covered magazines, igloo-style storage, and open storage area at Fort Carson, Colo.
Hourigan Construction was awarded a $21.3 million firm-fixed-price contract to design and build a Small Arms Testing & Evaluation Center at Joint Expeditionary Base Little Creek-Fort Story, Va.

Huitt-Zollars in a joint venture with Jacobs was awarded a $24 million firm-fixed-price contract for A-E services by USACE San Francisco District.

Innova Architects and WJA Design Collaborative were awarded a combined, not-to-exceed $9.5 million IDIQ multiple award contract for A-E services at Fairchild AFB, Wash.

Insight Pacific was awarded a $10.8 million firm-fixed-price task order under a previously awarded multiple award construction contract to repair warehouse Buildings 404B and 406B at Joint Base Pearl Harbor-Hickam, Hawai.’

Islands Mechanical Contractor and RQ-AECOM JV are among those firms awarded a $240 million IDIQ multiple award design-build contract for construction projects at Guantanamo Bay, Cuba.

Jacobs was awarded a $10 million firm-fixed-price contract by USACE Norfolk District for planning, design and construction phase services in support of the Department of Defense Education Activity.

JE Dunn Construction has been awarded a contract to build the $50 million, 64,420-ft² hospital modernization facility in support of the 99th Medical Group at Nellis AFB, Nev.

The firm also was awarded a contract for the $30 million Guthrie Ambulatory Health Care Clinic HVAC replacement project at Fort Drum, N.Y.

J.F. Brennan was awarded a $9.8 million firm-fixed-price contract by USACE Rock Island District for bulkhead recesses on the Illinois River Basin.

J. Kokolakis Contracting was awarded a $52.5 million firm-fixed-price contract by USACE New York District for renovation of Grant Barracks at the U.S. Military Academy at West Point, N.Y.

Kal Architects and Westeast Design Group are among those firms that will compete for each order of a $45 million firm-fixed-price contract for A-E services in support of the Facilities Modernization Program for the U.S. Air Force Medical Support Agency, U.S. Army Medical Command, and other customers of the U.S. Army Corps of Engineers that may have healthcare facility needs.

KZF Design was awarded a $10 million firm-fixed-price contract for A-E services by USACE Norfolk District.

Leebcor Services was awarded a $12.7 million firm-fixed-price task order under a previously awarded multiple award contract for the construction of a Naval Operational Support Center at Fort Gordon, Ga.

Lowe Engineers has been re-selected by USACE Savannah District for a one-year $3 million multidiscipline indefinite delivery contract with four option years for topographic, boundary, hydrographic, and unmanned aerial vehicle aerial surveying and mapping services.

LS Black Constructors was awarded a $7.6 million firm-fixed-price contract for

Granite Construction Company proudly supports the Federal Government by providing heavy civil infrastructure construction services including airfields and airfield facilities, secure facilities, tactical and military facilities, dams, site development, highways and roads, bridges, and emergency response services. We are committed to strengthening our nation’s security by constructing high-quality infrastructure and facilities for the benefit of our service members.

Questions? Please contact us at federal.division@gcinc.com.
construction of an indoor small arms range at Saint Paul Air Reserve Station, Minn.

MACNAK Construction LLC was awarded a $11.7 million firm-fixed-price task order under a previously awarded multiple award construction contract for the removal and replacement of three generators at Naval Radio Station Jim Creek in Arlington, Wash.

M.A. Mortenson was awarded a $50.2 million firm-fixed-price contract for Phase Two repairs and improvements to the Explosive Handling Wharf One Facility at Naval Submarine Base Kings Bay, Ga.

Manson Construction has been awarded a $15.7 million firm-fixed-price contract by USACE Jacksonville District for shore protection and beach re-nourishment services in Duval County, Fla.

The firm also was awarded a $10.1 million firm-fixed-price contract by USACE Fort Worth District for seepage repairs at Columbia Lock & Dam in Columbia, La.

Michael Baker International, Burns & McDonnell, AECOM, and Jacobs will compete for each order of a $44 million firm-fixed-price contract by USACE Sacramento District for military design and interagency and international services.

MSE Group has been awarded a maximum $10 million IDIQ A-E contract for professional hazardous material and waste management environmental compliance and engineering services within NAVFAC Southeast.

R.A. Burch Construction was awarded a $46.5 million firm-fixed-price contract for the Fighter/Attack-18 Aircraft Avionics Repair Facility replacement project at Naval Air Station Lemoore, Calif.

RORE was awarded an $11.7 million firm-fixed-price task order under a previously awarded multiple award contract for consolidating the Sheet Metal Shop into Building 155 at Joint Base Pearl Harbor-Hickam, Hawaii.

RQ Construction has been awarded a $63.6 million firm-fixed-price contract for design and construction of operations facilities for SEAL Teams One and Three at the Naval Special Warfare Coastal Campus in Coronado, Calif.

Sauer has been awarded a $31.4 million firm-fixed-price contract for barracks renovation at Fort Polk, La.

Seaside Engineering & Surveying, Merrick & Company, SurvTech Solutions, and Woolpert are four of seven firms that will compete for each order of a $49 million firm-fixed-price contract issued by USACE Mobile District for survey and mapping support services.

Semper Tek was awarded an $8.8 million firm-fixed-price contract for the design and construction of the Department of Veterans Affairs Community Based Outpatient Clinic at Fort Knox, Ky.

The Solution Foundry was awarded a $43 million firm-fixed-price contract by USACE Tulsa District to provide environmental management system consulting, training, planning requirements, budgeting, effective implementation, operation, and management review services.

Stanley Consultants was awarded a $15 million firm-fixed-price contract for A-E services for the 88th Readiness Division.

Stantec, Garver, and a joint venture of Burgess & Niple and Heapy will compete for each order of a $10 million firm-fixed-price contract for A-E services issued by U.S. Army Mission and Installation Contracting Command.

Strategic Value Solutions was awarded a $9.5 million firm-fixed-price contract by USACE Kansas City District for engineering services.

Suulutaaq was awarded an $8.2 million firm-fixed-price contract by USACE San Francisco District for repair of storm erosion damage in Alameda, Calif.

TDX Quality was awarded a $15.1 million firm-fixed-price contract for construction of KC-46A alterations of apron and fire hydrants at Joint Base McGuire-Dix-Lakehurst, N.J.

Tetra Tech was awarded a $10 million firm-fixed-price contract by USACE Seattle District for A-E services in support of the agency’s Civil Works projects.

Tidewater was awarded a $9 million firm-fixed-price contract by USACE Sacramento District for facility maintenance services in Northern California.

Turner Construction was awarded a $27.2 million firm-fixed-price contract by USACE Mobile District for renovation of the Army Primary Standards Laboratory at Redstone Arsenal, Ala.

Veolia was awarded an $89 million firm-fixed-price contract for Army Contracting Command for the treatment and disposal of hazardous waste resulting from the treatment of various chemical agents and/or biological agents.

Watermark Environmental was awarded a $9.3 million firm-fixed-price contract to construct a small arms range at Westover ARB, Mass.

Windamir Development is one of six firms that has been awarded a combined $99 million IDIQ, multiple award design-build contract for construction projects located within NAVFAC Southeast.

Woolpert was selected for a $49 million shared capacity A-E services contract to provide survey and mapping for USACE Mobile District.

SAF, Semper Tek, and All Phase Solutions are among those firms that will compete for each order of a $10 million firm-fixed-price contract for construction projects in support of the Tennessee National Guard.

Zyscovich Architects was awarded a $10 million fixed-price-award-fee contract for A-E services by USACE Norfolk District.
It has been a privilege to contribute to our Society’s flagship publication for the past six years as the Military News Contributing Editor. I hope that the columns have given you, the reader, insight and understanding of the many impactful things that military engineers do each and every day—some that are well known, and some that are fairly unique. I know that compiling each column has opened my eyes to the diversity of our mission sets and the wide-ranging impacts on national security and international coalitions that our actions bring about in our world, whether we be soldiers, sailors, airmen, Marines, Coast Guardsmen or Commissioned Corps engineers.

President Herbert Hoover said it best about engineering. “It is a great profession,” he remarked. “There is the fascination of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal or energy. Then it brings jobs and homes to men. Then it elevates the standards of living and adds to the comforts of life. That is the engineer’s high privilege.”

As you read the following stories, reflect on the words of President Hoover and consider how we may all better enjoy our high privilege by contributing to our profession, and our nation. I look forward to seeing many of you around SAME in the future. – T.S.

HURRICANE FLORENCE RESPONSE
Logistics and technical advisors with the U.S. Army Corps of Engineers (USACE) joined engineering battalions of the South Carolina National Guard as part of Hurricane Florence response and recovery. USACE supported local, state and federal partners in the post-storm period.

A key effort was keeping the U.S. Highway 501 corridor open as long as possible to ensure local residents have access to medical services, food and supplies.

With that in mind, USACE personnel worked around the clock to support the effort, supplying more than 22,000-ft of wire mesh barrier material and providing 125,000 sandbags to the Emergency Operations Center in Horry County to support the areas impacted by flooding and assist in maintaining access to roads.

(Contributed by Edward Johnson, USACE Tulsa District)

WOLFPACK ENGINEERS TRAIN
During a three-week long training mission, soldiers from 1st Platoon, 643rd Engineer Support Company, 11th Engineer Battalion, 2nd Combat Aviation Brigade, provided road improvement at Training Area 120, Chaparall, building two access trails and installing three staging-pads.

Units from all over the South Korean Peninsula travel every quarter to train and refine their warfighting capabilities. And while the mission of Army engineers is to enhance mobility and improve survivability of maneuver units on the battlefield, horizontal engineers specifically focus on horizontal surface improvements such as roads, trails, airfields or other flat surfaces, as well as in digging fighting positions.

One of the Korean Peninsula’s few Army horizontal engineer platoons, the “Wolfpack” soldiers departed Camp Humphreys and traveled 174-mi, hauling four M120 Motorized Graders, a 966H 5-yd Loader, two D6K Bulldozers and a Vibratory Roller along with the standard vehicles such as the four 10-T Dump Trucks, Humvee’s, and M983 Light Equipment Transports with trailers through Seoul.

A wide array of equipment was used to achieve the finished product. The 35 soldiers operated the bulldozers to clear the vegetated areas for the three staging pads. They used the motorized graders to shape the road, the 10-T dump trucks to haul gravel material, the front end loader to load over 5,160-yd³ of gravel into the trucks to spread across the trails and staging pads and, lastly, the vibratory roller was driven over the final surfaces to achieve the final compaction strength.

(Contributed by U.S. Army Garrison Humphreys)
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RESOLUTE CASTLE 2018
The suspension of the Polish and U.S. flags between two backhoe loaders during the Resolute Castle 2018 closing ceremony at the Drawsko Pomorskie Training Area in Konotop, Poland, provided the final setting for the projects conducted by the two countries. The ceremony may have marked the end of the multinational, joint training exercise in support of Atlantic Resolve, but not for the partnerships built along the way.

Resolute Castle 18 was a six-month exercise focused on building and reinforcing training areas throughout Poland and Romania. For the duration in Poland, nine U.S. Army National Guard engineer units from five states, U.S. Navy Seabees, and British Army engineers assigned to the 75th Engineer Regiment worked on building and reinforcing the training areas during back-to-back three-week training rotations.

This year marked the first time that U.S. Army Europe partnered with Poland for Resolute Castle. The exercise enables U.S. units to assemble forces quickly, conduct rotational exercises alongside their multinational counterparts, and demonstrate deterrence while in a complex security environment. The main objective this year was the extension and enhancement of Drawsko Pomorskie Training Area as well as customizing it to Polish and other foreign requirements.

(Contributed by Sgt. 1st Class Kimberly Calkins, 218th Maneuver Enhancement Brigade)

JOINT EFFORT AT PACIFIC ANGEL
U.S. airmen, Marines and Sri Lanka Air Force engineers worked to improve schools during Pacific Angel 18-4 at Anuradhapura and Vavuniya, Sri Lanka. Throughout the engagement, participants completed seven engineering civic action projects, sharing their knowledge, equipment and accomplishments with one another. School buildings in the local area were the primary focus of the engineer's projects. The group installed and repaired lights, fans, roofs, ceilings, water pumps and more, ensuring children in the community had facilities conducive to learning.

The projects will affect the community for years to come. The students will have better lighting and facilities, and cooler classrooms, to complete their education. Collectively, the team of 16 U.S. servicemembers and 10 Sri Lanka Air Force engineers easily integrated to successfully complete their projects and mission.

Now entering its 11th year, Pacific Angel ensures the region’s militaries are prepared to work together to address humanitarian crises. The engagements have impacted the lives of tens of thousands of people by providing health services ranging from dental, optometry, pediatrics, and physical therapy, to civil engineering programs, humanitarian aid, disaster relief, and subject matter exchanges.

(Contributed by Tech Sgt. Heather Redman, Pacific Air Forces Public Affairs)
ROUGHRIDERS CONDUCT BREACHING

Plumes of smoke from explosive detonations were visible from Curry Demo as combat engineers with Alpha Company, 8th Engineer Battalion, 2nd Brigade Combat Team, 1st Cavalry Division conducted a demolition range at Fort Hood, Texas.

Combat engineers built a reputation conducting route clearance patrols during counter-IED operations. But route clearance is only one part of the capabilities these engineers bring to the fight.

They are also experts at breaching operations, utilizing demolitions in a variety of means. Countless hours are spent in the classroom discussing safety and theory, but hands-on training gives combat engineers the confidence and experience required to be useful during combat operations.

The mission and available resources dictate how engineers will use demolitions. The charge depends on the obstacle that must be breached. Breaching a barrier gives maneuver forces the most expedient way to close with and destroy the enemy. It requires expertise in handling and creating explosive devices and detonation charges.

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During the range, the soldiers trained on the Bangalore, water-impulse and concrete charges. The "Roughriders" took advantage of the time in the field and conducted some additional training in river reconnaissance. They will return in the fall for more training. *(Contributed by Maj. Carson Petry, 2nd Armored Brigade Combat Team)*

**SEABEES CONDUCT FIELD TRAINING**

Naval Mobile Construction Battalion 3 deployed to Fort Hunter Liggett, Calif., to complete a three-week field training exercise earlier this year. The training simulates a contingency environment with operations taking place on a main forward operating base, with forces distributed outward to multiple detachment locations.

By providing defense-in-depth at the forward operating base, detachment camps, and project sites, the Seabees maintained command and control while demonstrating general engineering support capabilities in preparation for major combat operations in the Indo-Pacific Command area of operations.

The battalion executed a wide array of construction tasking, to include a five-bay medium girder bridge, a 10-yd³ concrete bridge abutment, and a new Southwest Asia hut. One of the detachments conducted airfield damage repair, while another laid down 550-ft of asphalt paving.

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Another detachment utilized the Ultimate Building Machine to build two K-Span structures in support of the Exercise Logistics Coordination Center and the 7th Marine Regiment.

The construction provided improved facilities for the operations of adjacent commands, while demonstrating the Seabees’ capabilities in a contingency environment. The training not only enabled the battalion to display its technical and tactical proficiency, but allowed it to exercise over-the-horizon distributed operations and interoperability with friendly units. Seabees are the expeditionary engineering and construction experts of the naval service, providing adaptable and combat ready engineering and construction forces.

“We are building combat ready Seabees and Seabee teams,” said Cdr. Joseph Harder, CEC, USN, Commanding Officer of Naval Mobile Construction Battalion 3. “This multi-week evolution gives the battalion the opportunity to demonstrate readiness to support major combat operations.”

Planning by the battalion staff and the Exercise Control Group from Naval Construction Group 1 enabled successful project execution and completion of all tactical and technical certification requirements for future deployment. (Contributed by Ens. Cassidy Griffiths, Naval Mobile Construction Battalion 3 Public Affairs)
ENGINEERS “JUMP IN” TO SUPPORT
In less than two days, the Corps of Engineers amassed an army of experts from five districts and one battalion to assess damage from Hurricane Florence and repair critical infrastructure at the Military Ocean Terminal Sunny Point, N.C. That legion of support included 43 paratroopers from the 27th Engineer Battalion, Fort Bragg, N.C., who arrived in less than 12 hours from their execution order in response to damages.

The soldiers, who belong to the 161st Engineer Support Company Airborne, had “blades in dirt” only hours later. “We’re an Airborne Engineer Support Company,” said the unit’s commander, Capt. Elizabeth Betterbed, USA. “We’re designed to jump in and repair airfields.”

But instead of airfields, the team is moving massive amounts of dirt in order to repair roads, berms and other areas where flooding and erosion disrupted the infrastructure. USACE Savannah District is leading the effort to provide the services needed to bring Military Ocean Terminal Sunny Point back to full capability in the shortest amount of time practical. The work includes inspections of the perimeter sector, rail lines, bridges, wharves, buildings and roads.

Beyond the Sunny Point recovery, the Corps of Engineers was entrusted with 33 Federal Emergency Management Agency mission assignments in response to Florence, totaling more than $17 million. Some of these missions include temporary emergency power, debris removal, water and wastewater assessment, temporary roofing, and dam safety technical assistance.

(Contributed by Russell Wicke, USACE Savannah District)

TRAINING ON AIRFIELD REPAIR
The Air Force is taking airfield defense and repair to new heights by implementing the Rapid Airfield Damage Assessment System (RADAS), a method of using small, unmanned aircraft to scan for airfield damage under wartime conditions, and even provide roof and electrical wire monitoring in peacetime.

Recently, two airmen assigned to the 51st Civil Engineer Squadron at Osan AB, Republic of Korea, were sent to Tyndall AFB, Fla., to receive training and become certified RADAS operators.

By the end of two weeks of training, Senior Airman Herman Stribling, USAF, Engineering Technician, and Staff Sgt. Jason Holmes, USAF, Requirements and Optimization Technician, had flown multiple aircraft simultaneously, conducted day and night operations, and learned to track moving objects. Manually going over the airfield to mark damage takes more time and can be dangerous. This method is faster and safer.

“This will be the standard for the Air Force,” Holmes said. “Even in the private sector, drones are being used to survey oil
rigs, migration patterns of wildlife, and checking infrastructure.”

Currently, the operators are capable of flying two drones at once, but look forward to being able to fly multiple drones as a swarm in the future.

*(Contributed by Staff Sgt. Benjamin Raughton, 51st Fighter Wing Public Affairs)*

**MARINES HELP FUEL OPERATIONS**

As the sun broke through the clouds over Camp Hansen, Okinawa, Japan, Marines rushed to quickly assemble a fuel site, their boots thundering across the ground.

Members of Bulk Fuel Company, 9th Engineer Support Battalion, 3rd Marine Logistics Group, practiced fuel support operations training to further develop proficiency in fueling support operations for upcoming exercises and deployments.

“Our mission as a company is to provide petroleum products to the Marine Logistics Group and its supporting units,” said Warrant Officer John Paul Runge, USMC, Commander of 2nd Platoon, Bulk Fuel Company. “We need to be able to set up anywhere and establish these sites anywhere the Marine Corps sends us.”

During the exercise, the Marines used water to simulate petroleum products, which allowed them to safely pump inert liquids during training. The bulk fuel specialists were timed on their ability to quickly set up and tear down modular systems, as well as their ability to find faster ways to assemble fuel sites.

The training began with unrolling collapsible fuel bladders and connecting multiple lengths of hoses in order to direct water from storage bladders to distribution valves. The modular system, using multiple hoses connected to one another, stretched from the grassy field in front of the Bulk Fuel Company warehouse to the concrete lot in the back, 200-yd away, where a bladder full of water was stationed.

The Marines also patrolled lines from fuel sites to distribution points to ensure everything flowed properly with no breaks or stoppages.

“Our hoses can reach up to 400-ft,” said Staff Sgt. Bradley Hoffman, USMC, Platoon Sergeant. “We walk the line to make sure it’s not leaking. If we are losing product, then we are not going to be able to complete our mission.”

The training enabled the Marines to practice quickly building and operating fuel distribution points in various scenarios, which can be controlled training environments, combat zones or in challenging terrain where natural disasters have occurred. In real-world situations, this allows the company to fuel vehicles and heavy equipment in support of combat operations as well as humanitarian assistance and disaster relief.

*(Contributed by Lance Cpl. Armando Elizalde, 3rd Marine Logistics Group)*

Submit Military News items, with high-resolution (300-dpi) images, to editor@same.org.
Installing Storm-Tide Sensors
In advance of Hurricane Florence, response crews from the U.S. Geological Survey (USGS) installed storm-tide sensors at key locations along the coastlines of North Carolina and South Carolina. Under a mission assignment from the Federal Emergency Management Agency (FEMA), USGS deployed about 160 sensors and consulted with federal and state partners about the need for similar equipment for other areas along the mid-Atlantic Coast.

Storm surge is among the most dangerous hazards unleashed by hurricanes, with the capacity to destroy homes and businesses, wipe out roads and bridges, overwhelm water and sewer systems, and profoundly alter coastal landscapes.

The sensors installed to measure Hurricane Florence’s storm tide are housed in vented steel pipes a few inches wide and about a foot long. They were installed on bridges, piers, and other structures that have a good chance of surviving the storm. The information the sensors collect will help define the depth and duration of a storm surge, as well as the time of its arrival and retreat. That information will help public officials assess storm damage, discern between wind and flood damage, and improve computer models used to forecast future floods.

In addition to storm-tide sensors, 25 rapid deployment gauges were installed at critical locations anticipated to be impacted by storm surge or floodwaters, but where USGS does not have permanent streamgages. The agency coordinated with the National Weather Service, FEMA, and state and local agencies to put the rapid deployment gauges in places with the greatest need. These specialized gauges can be quickly installed on bridges to provide real-time information on water levels.

Preparing for More Storms
With the arrival of peak hurricane season this year, multiple named storms swirled in the Atlantic, Pacific, and Caribbean, with enormous hurricanes hitting the Carolinas and Southeast Asia simultaneously. Media coverage frequently mentioned the science-based connection between climate change processes and mechanisms for warm ocean temperatures to generate more intense storms, which spin faster, hold more water, and cover more areas. The Government Accountability Office released an Initial Observations Report on Federal Response and Key Recovery Challenges the first week of September. The assessment recognized the shortage of capable personnel to assign to multiple disasters, while adding scrutiny on federal agencies responsible.

How well prepared is the nation and the world for more and bigger storms? Not very well, it seems, given the pace the threat is increasing—though technology is helping.

Globally, fossil fuel production and exports continue to rise. However, in those regions that are rich in renewable energy, at times those resources are putting renewables ahead of fossil fuel generation. Greater research and development into technology for direct current power transmission and distribution will help with bringing electricity to market from remote areas where wind and solar generation is efficient and economical. Other examples of technology assisting in understanding extreme weather threats are rapid installation of sensor arrays for tracking real-time conditions related to individual storms and the use of intensive remote sensing for monitoring climate change-trending effects. – W.G.

Contributed by USGS

The U.S. Geological Survey installed a storm-tide sensor in Dare County, N.C., in preparation for Hurricane Florence. USGS PHOTO BY STEVE HARDEN
Partnering with the U.S. Military at home and abroad to protect warfighters from emerging cyber and environmental threats

CYBERSECURITY
To protect critical infrastructure at Naval Base Guam, CDM Smith assisted NAVFAC in implementing the DoD’s Risk Management Framework (RMF) for Industrial Control Systems.

PERFLUORINATED COMPOUNDS IN AQUEOUS FILM-FORMING FOAM (AFFF) SYSTEMS
CDM Smith leads a global team in examining AFFF systems at Navy installations to identify and recommend disposition for poly- and perfluoroalkyl substances (PFASs). The CDM-AECOM Multimedia Joint Venture is completing this NAVFAC assignment.
**SOURCES OF ELECTRICITY GENERATION**

Electricity generators that use fossil fuels continue to be the most common sources of electricity generation in most states, according to the Energy Information Administration. In all but 15 states, coal, natural gas, or petroleum liquids were the most-used electricity generation fuel in 2017. Since 2007, the number of states where coal was the most prevalent electricity generation fuel has fallen as natural gas, nuclear, and hydroelectricity have gained market share.

In 2017, coal provided the largest generation share in 18 states, down from 28 states in 2007. Natural gas had the largest share in 16 states, up from 11 in 2007. Petroleum remained the largest generation share in only one state, Hawaii, where it provided 62 percent of the state’s electricity generation in 2017. For the United States as a whole, natural gas provided 32 percent of total electricity generation in 2017, slightly higher than coal’s 30 percent share.

Nuclear power plants provided the largest electricity share in nine states, up from six in 2007. Hydroelectricity was the most prevalent generation source in six states, up from four in 2007. Hydroelectricity is the only renewable energy source with the largest share in any state, but that may soon change with the continued addition of wind turbines in states such as Kansas and Iowa.

*(Contributed by EIA)*

**FURTHERING ELECTRIC GRID EFFECTIVENESS**

The Department of Energy (DOE) announced up to $15 million in funding for a new Advanced Research Projects Agency-Energy program: Building Reliable Electronics to Achieve Kilovolt Effective Ratings Safely (BREAKERS).

The BREAKERS projects will develop designs for medium-voltage, direct current (DC) circuit breakers for a variety of applications. They will inform the creation of new devices that are capable of better securing the grid by eliminating electrical faults, improving efficiency and reaction times while potentially enabling greater proliferation of renewable resources and eventual electrification of ships and aircraft. Fields that could benefit from BREAKERS projects include surge protection, transportation electrification, grid distribution, intermittent power interconnection, and offshore oil and gas production.

Developed by EPA’s Smart Sectors Program, the snapshots application shows comprehensive, historical environmental and economic performance on a sector basis and allows users to visualize the data over the last 20 years.
Medium-voltage DC circuit breakers could enable significant improvements in the U.S. electrical system, transforming how electricity is delivered and managed across the entire power grid, as well as a multitude of critical applications in industry, transportation, and resource production.

Today’s grid is powered mostly by alternating current electricity. DC current has gained in popularity, thanks in part to lower distribution losses and higher power carrying capacity. However, because DC current behaves differently, breakers at higher voltages are prone to electrical arcing, which can lead to fire or breaker failure. BREAKERS projects must overcome this limitation while handling large amounts of power and voltage.

*Contributed by DOE*

**ADVANCING CRITICAL ENERGY INFRASTRUCTURE**

In October, DOE announced funding of up to $28 million to support the research, development, and demonstration of next-generation tools and technologies to improve the cybersecurity and resilience of critical energy infrastructure, including the electric grid and oil and natural gas infrastructure.

With the funding, research partnerships will create and make available innovative technologies that help prevent, detect, and mitigate cyber attacks. The teams will pursue innovative approaches, such as redesigning the current architecture that exposes the energy grid to cyber threats so that existing and future energy delivery systems can detect adversarial actions and adapt to survive while continuing to support critical functions.

Each awarded project has a clear path to develop technology that will meet the energy sector’s stringent operational requirements of energy delivery systems that reduce cyber risks. The 11 awarded projects advance the strategy articulated in DOE’s Multiyear Plan for Energy Sector Cybersecurity.

*Contributed by DOE*

**ASSESSING ENVIRONMENTAL PERFORMANCE**

The Environmental Protection Agency (EPA) has released a new interactive, web-based tool that provides information about the environmental and economic performance of industry sectors. Developed by EPA’s Smart Sectors Program, the snapshots application shows comprehensive, historical environmental and economic performance on a sector basis and allows users to visualize the data over the last 20 years.

The first modules to be released showcase three sectors: iron and steel, chemical manufacturing, and utilities and power generation. Modules for other sectors will be released on a rolling basis.

“The sector snapshots released today show in a transparent and accessible way how a specific industry’s environmental and economic performance has changed over the last two decades,” said EPA Acting Administrator Andrew Wheeler.

The snapshots tool uses public data from EPA and other federal sources. The application offers access to information about general sector characteristics, environmental performance indicators, and economic data through interactive graphics. Users can select environmental and economic indicators individually, or paired combinations of indicators, to view trends over time.

For more information, visit www.epa.gov/smartsectors.

*Contributed by EPA*

**COMMUNITY RESILIENCE THROUGH EDUCATION**

The National Oceanic & Atmospheric Administration’s (NOAA) Environmental Literacy Program is funding nine new projects that will use education to build the foundation for resilience to weather and climate hazards. Together, these projects—reaching from Alaska to the U.S. Virgin Islands—will receive a total of $3 million to empower people to protect themselves and their communities from local environmental threats.

Recent events underscore the need for resilience education. In
2017, the United States experienced 16 billion-dollar disasters, including three catastrophic hurricanes and several deadly wildfires. The projects engage members of the public in understanding how their municipalities can become more resilient and encourage people of all ages to take part in building safe and enduring communities.

This is the fourth year NOAA’s Office of Education is funding resilience projects through its Environmental Literacy Program. The 2018 competition received 237 pre-applications from 45 states, the District of Columbia, and three territories, with a total request of more than $100 million. Of these, 59 applications were accepted for

At the Boston Museum of Science, members of the public discuss ways to reduce vulnerability to climate hazards. This project was funded by the National Oceanic & Atmospheric Administration’s Environmental Literacy Program.

NOAA PHOTO

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ENERGY & SUSTAINABILITY NEWS

NEW SUPERFUND SITES ADDED
In September, EPA announced the addition of five hazardous waste sites to the Superfund Program’s National Priorities List (NPL) and proposed to add another six sites.

The NPL includes the nation’s most serious uncontrolled or abandoned hazardous waste sites. The list serves as the basis for prioritizing EPA Superfund cleanup funding and enforcement actions. Only listed sites are eligible to receive federal funding for long-term, permanent cleanup.

EPA initiates Superfund involvement at sites when states, tribes, or communities ask for assistance, or when the agency finds contamination during its own investigations. Sites are deleted from the NPL once EPA completes all response actions and achieves all cleanup objectives.

This year, for the first time, EPA is listing sites based on subsurface intrusion, or intrusion of contaminants into occupied spaces.

Sites Added to the NPL
- Rockwell International Wheel & Trim - Grenada, Miss.
- Southside Chattanooga Lead - Chattanooga, Tenn.
- Broadway Street Corridor Groundwater Contamination - Anderson, Ind.
- Donnelsville Contaminated Aquifer - Donnelsville, Ohio
- Delsasco Forge - Grand Prairie, Texas

full review. The funded projects are based on local resilience plans and will create new partnerships between education institutions, government agencies, and nonprofits. Projects focus on the most pertinent environmental challenges facing these areas, including sea level rise, severe storms, flooding, drought, and extreme heat.

(Contributed by NOAA)
ENERGY & SUSTAINABILITY NEWS

Sites Proposed for the NPL
- Magna Metals - Cortlandt Manor, N.Y.
- Shaffer Equipment/Arbuckle Creek Area - Minden, W.V.
- Cliff Drive Groundwater Contamination - Logansport, Ind.
- McLouth Steel Corp. - Trenton, Mich.
- Sporlan Valve Plant #1 - Washington, Mo.
- Copper Bluff Mine - Hoopa, Calif.

In addition to health and safety benefits, Superfund cleanups strengthen local economies. Data collected through 2017 shows that at 487 Superfund sites in reuse, approximately 6,600 businesses generated $43.6 billion in sales and employed 156,000 people who earned a combined income of $11.2 billion.

For more information, visit www.epa.gov/superfund.
(Contributed by EPA)

2018 SUMMER HEAT RANKS FOURTH
The summer of 2018 ranked as the fourth hottest on record for the contiguous United States, in a tie with 1934.

The average August temperature across the nation was 73.6°F (1.5°F above average), making it the 17th-warmest August in the 124-year record, according to the National Centers for Environmental Information, an agency within NOAA.

Parts of the Southwest had temperatures in the top 10 for warmth, while several Northeast states experienced record heat, largely due to record-warm overnight temperatures.

The average precipitation for August was 2.99-in (0.37-in above average), making it the 20th wettest August on record, tied with 1979 and 2005. The Mid-Atlantic saw record precipitation.

During the meteorological summer (June through August), the average temperature for the contiguous United States was 73.5°F, 2.1°F above average. The average U.S. temperature for the year to date (January through August) was 55.7°F, 1.8°F above normal. It was the 10th warmest on record.
(Contributed by NOAA)

MEASURING GREENLAND ICE LEVELS
The National Aeronautics & Space Administration’s Oceans Melting Greenland campaign took to the sky in August for its third year of gathering data on how the ocean around Greenland is melting its glaciers.

The first two years of operations already collected the most comprehensive data available on the subject, but for researchers with the Jet Propulsion Laboratory in Pasadena, Calif., they would like more. For the third year in a row, a team will drop about 250 probes just offshore all around the island, with some drops close to the fronts of ocean-terminating glaciers. The probes sink 3,000-ft (1,000-m) into the seawater, recording temperature and salinity as they go down.
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This year, a new plane and new base should improve the campaign’s weather odds. The plane, a Basler BT-67 operated by NASA contractor Airtec, can take off and land on a shorter runway than either of the planes the researchers previously used. That allows the team to base their east coast operations in Kulusuk, a small airport in southeastern Greenland, rather than a larger airport in Iceland. The lengthy “commute” from Iceland cut into the time available for research on each flight, and the longer flight path meant more places where there might be bad weather.

When the team completes the east coast drops, it then will move to Thule AB—a U.S. military installation located in northwestern Greenland—for drops on the western side of the island. Being in Greenland the whole time will allow the researchers to get more up close and personal with the ice sheet and glaciers.

(Contributed by NASA)

WORLD CRUDE OIL PRODUCTION
The Energy Information Administration estimated in its latest Short-Term Energy Outlook, released in September, that the United States is now the largest global crude oil producer, likely surpassing Russia and Saudi Arabia. In February, U.S. crude oil production exceeded that of Saudi Arabia for the first time in more than two decades. In June and August, the United States surpassed Russia in crude oil production for the first time since February 1999. It is expected that U.S. crude oil production will continue to exceed those nations’ production for the remainder of 2018 and through 2019.

U.S. crude oil production, particularly from light sweet crude oil grades, has rapidly grown since 2011. Much of it has occurred in the Permian Region in western Texas and eastern New Mexico, the Federal Offshore Gulf of Mexico, and the Bakken Region in North Dakota and Montana.

(Contributed by EIA)

FUNDING FOR RESTORING WETLANDS
The Migratory Bird Conservation Commission has approved $23.8 million in grants for the U.S. Fish & Wildlife Service and its partners to conserve or restore almost 135,000-acres of wetland and associated upland habitats for waterfowl, shorebirds and other birds in 17 states.

The grants, made through the North American Wetlands Conservation Act (NAWCA), will be matched by over $60 million in partner funds.

NAWCA grants ensure that waterfowl and other birds are protected throughout their lifecycles. The grants work to conserve bird populations and wetland habitat, while supporting local economies and traditions such as hunting, fishing, birdwatching, family farming and cattle ranching.

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NEW TOOLS FOR MASTER PLANNING

Good design and construction starts with good master planning. A hallmark of effective master planning is the ability to consider the full spectrum of conditions or objectives that are associated with a project. It makes sense then, especially for complex or multi-purpose projects and for those expected to perform over a long built lifespan that is challenged by uncertainty and significant change.

This Technology News column highlights two capabilities that have considerable potential for improving master planning—one related to net zero objectives and one for integration of ecological considerations for large systems planning. The net zero planning capability was previously covered in this column in May-June 2014 and May-June 2016. This time, we capture progress since then and examine a new emphasis on resilience.

The second topic is a newly emerging capability for evaluating the potential for benefiting riverine ecosystems through more effective operation of available infrastructure and control systems capabilities. This serves not only as an excellent example of integrating ecological objectives into water management practices, but of how to approach this challenge for any infrastructure.

The third topic is an update on progress made in the application of additive manufacturing in expedient infrastructure. The maturation of this type of construction capability will alter the options for infrastructure master planning in the future.

SYSTEM MASTER PLANNER TOOL

A novel community-scale resilience and sustainability optimization tool, developed by the Construction Engineering Research Laboratory of the U.S. Army Engineer Research & Development Center (ERDC-CERL), is designed to provide resilience and sustainability planning support to installation planners and energy managers. The System Master Planner (SMPL), formerly known as Net Zero Planner, is the product of an Army-funded research program that leverages experience gained from energy, water, waste, and low-impact development projects conducted on Army installations. The tool incorporates advanced methods for optimizing complex systems at the base level.

Planning for a resilient and sustainable installation is a complex undertaking that requires an optimal mixture of demand-reduction measures and community-scale system integration. Before SMPL, planners lacked integrated tools to analyze and optimize the performance of complex, dynamically coupled systems needed to achieve resilience and sustainability goals in a timely and cost-effective manner. They addressed energy, water, waste, and low-impact development systems on an individual building basis without considering interactions between them, community scale measures, or the needs of future generations.

Use of the SMPL Tool, as part of an integrated planning process that addresses these considerations at the community scale, is essential to achieve the Army’s long- and mid-term resilience and sustainability goals.

SMPL offers planners a modeling, optimization, and decision-support tool that is designed to find the lowest lifecycle cost solution, while meeting policy and legislative goals. These goals may include critical mission loads, energy savings, water conservation, waste diversion, renewable energy usage, and others. This is accomplished by

The System Master Planner Tool is currently being used to support energy and water resilience planning at Fort Bragg, N.C., as a part of its pilot Installation Energy & Water Plan. U.S. ARMY PHOTO
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TECHNOLOGY NEWS

reducing overall demands in buildings and then assessing possible combinations of supply and distribution infrastructure to meet mission requirements.

The SMPL tool, which has been used on over 60 energy and water planning efforts, is listed as a recommended tool in the Army’s official guidance for the completion of the Installation Energy & Water Plan (IEWP) requirement.

IEWP has two final deliverables: one, an agreed upon long-term plan for the installation that can be used to guide short-term decision making and programming, which requires the garrison commander signature; and two, an accompanying project implementation plan. The implementation plan provides a suggested project breakdown for each year of the first five years of the long-term plan and includes a description of the need that each project meets (cost reduction,
resilience, assured access to power and water) as well as economic information, energy and water impacts, suggested funding source, and the responsible point of contact.

The SMPL tool supports this planning work by providing a structured methodology, automated cost engineering, and a framework for comparing and evaluating plans.

The tool is currently being used to support energy and water resilience planning at Fort Bragg, N.C., as a part of its pilot IEWP. SMPL has enabled the base to quickly identify high-value cost and resource saving projects for facilities, and to suggest cost-effective improvements to central energy plants that increase resilience.

For more information, contact Dr. Matthew Swanson, Dr. Michael Case, or Dr. Richard Liesen, Construction Engineering Research Laboratory, U.S. Army Engineer Research & Development Center; matthew.m.swanson@usace.army.mil, michael.p.case@usace.army.mil, or richard.j.liesen@usace.army.mil.

WATER RESOURCES MASTER PLANNING
As part of its Civil Works missions, the U.S. Army Corps of Engineers (USACE) performs—at more than 300 multi-purpose reservoirs—a diverse set of activities, including aquatic habitat restoration, modification of existing infrastructure to improve the environment, use of dredged material for habitat creation, and management and stewardship responsibilities.

The Hydrologic Engineering Center (HEC) supports USACE by building technical capability in water resources engineering, planning, and management. The center is perhaps best known for its water-related software tools, which are widely used within USACE and by many other entities in the United States and abroad. One of these, the Ecosystem Functions Model (EFM) is a collection of emerging software developed by HEC. It is comprised of several tools that help scientists and engineers consider the natural resource implications of restoration or management alternatives.

At its most fundamental level, EFM uses ecological information (such as species life histories) and hydrologic and hydraulic datasets (field measurements or model outputs) to simulate ecological benefits. Results can be statistical and spatial, enabling comparisons of numerical performance measures and habitat maps. A pair of recent EFM applications highlight some of its key features.

**Arid Landscape.** In the arid southwestern United States, the software was used to test more than 9,000 reservoir release patterns to determine which were most effective at stimulating the recruitment of riparian tree seedlings. Maintaining a healthy riparian corridor that provides habitat and environmental benefits is a stated goal of resource management for the modeled river system. Seedling recruitment is a key step in sustaining the species diversity and age structure needed to promote riparian habitat quality and resilience. In EFM, consideration of the large set of...
alternatives was made possible by the software’s new batch compute feature, which cycled through all of the management options, assessing how well each met the ecological criteria associated with germination and seedling survival. Interestingly, results were expressed as an operational rule for the upstream reservoir such that future water releases could be shaped opportunistically to optimize seedling recruitment. In this way, EFM served as a technical bridge between scientific knowledge and the operation of built infrastructure.

*Water-Rich Environment.* In the more water-rich northwestern United States, EFM was used to assess ecological benefits of a restoration project designed to increase connectivity between a river and part of its seasonally inundated floodplain. In addition to wetland vegetation and waterfowl considerations, EFM simulated habitat for juvenile salmon moving from upstream hatching areas to the Pacific Ocean. Using seasonality and depth preferences for the fish and a 2D rendering of floodplain hydraulic conditions, EFM simulated habitat provided by current management practices and alternative configurations of conveyance structures and operations. Being able to map habitat based on 2D inputs is a new feature, and being able to track ecological responses at the level of detail of river hydraulics modeling strengthens connections between ecological planning and engineering analyses. Further, it supports the continuity of vision and information as alternatives advance from plan formulation through design and construction.

The EFM suite is generic in that it relies wholly on the user to define which aspects of the ecosystem are of key interest, how those aspects are to be investigated, and which hydrologic (climate change), operational (reservoir management), or restoration scenarios (channel topographies) should be considered.

HEC software are available for free at www.hec.usace.army.mil. For more information, contact Dr. John Hickey, P.E., Hydrologic Engineering Center, Institute for Water Resources; john.hickey@usace.army.mil.
LARGE-SCALE ADDITIVE CONSTRUCTION

A novel steel reinforced barracks hut structure has been 3D-printed by U.S. Marines and USACE personnel in an extended operations experiment. ERDC-CERL continues to make progress in operationalizing the use of concrete as a 3D printing material. Recent work has focused on methods for Reinforced Additive Manufacturing of Concrete, which has been labeled “RAMCrete.”

Since printing a 512-ft² building in summer 2017, the ERDC-CERL team has printed and tested six large steel-reinforced wall sections with Marines from Marine Wing Support Squadron 372. The team also conducted a two-week exercise with soldiers from the Army’s 5th Engineer Battalion and 416th Theater Engineer Command at Fort Leonard Wood, Mo., and printed another 500-ft² building with the Marines in August 2018 to test a new building reinforcement and geometry design made possibly by LSAC technology.

The enhanced-strength wall was designed under contract by Skidmore, Owings & Merrill, with the purpose of determining the steps that would be necessary to enable a structural engineer to certify the safety of a 3D-printed building under most existing building codes.

The most recent experiment also tested the ability to continuously 3D print with concrete over an extended period of time. The Marines began the print at 6:00 p.m. on Aug. 1, worked until 10:00 a.m. on Aug. 2, then resumed at 2:00 a.m. on Aug. 2, and continued until 10:00 a.m. Results were promising. Tests on the walls showed that they exhibited approximately 2.5 times greater strength than a flat wall when subjected to out of plane forces. The extended operations test showed that it is possible to operate a 3D concrete printer continuously, provided that the concrete pump is periodically cleaned to prevent the buildup of cured concrete in the hopper.

The walls of the first building took 21.5-hours of printer time to print over five to six weeks of total clock time, while the walls of the second building took 14-hours of printer time over a period of a week. A total of 85 percent of the walls were printed in 40-hours of clock time, with a mechanical malfunction causing a delay in finishing the last 15 percent. The three experiments since the summer of 2017 have demonstrated the feasibility of using portable concrete printing equipment in a deployed environment, which would eliminate the need for plywood or steel forms.

Soldiers and Marines were especially enthusiastic about application of LSAC to T-Walls, bunkers, fighting positions, culverts, and other concrete items often fabricated when deployed. Lessons learned include the need for quality control of materials, especially aggregate size, and additional automation material batching operations to reduce required personnel from five to three.

For more information, contact Dr. Michael Case, U.S. Army Engineer Research & Development Center; michael.p.case@usace.army.mil.
Completion of a major upgrade on the 60-year-old Folsom Dam in Northern California has improved flood protection for the area’s nearly 1.5 million residents.

By Richard Brown

When the U.S. Army Corps of Engineers (USACE) began construction of Folsom Dam in the early 1950s, the first pocket-sized transistor radio was about to become one of the most popular electronic devices in communication history. In 1960, four years after work was completed on Folsom Dam, a little more than 190,000 people lived downstream of the dam in the City of Sacramento.

Much has changed since the mid-20th century. The transistor radio eventually morphed into the smartphone, and Sacramento
DESIGN & CONSTRUCTION

JOINT FEDERAL PROJECT
Plans were drafted, and the $900 million Folsom Auxiliary Dam and Spillway Mega-Project was born. But timing is everything. Just as the new Joint Federal Project (JFP)—the moniker given based on the project’s unique partnership—was getting underway, Hurricane Katrina swept through New Orleans, a city that was thought to have significantly higher flood protection than Sacramento. In fact, Sacramento had a much lower level of flood protection than many notable river cities across the nation, and in the wake of Katrina, many were left wondering which city could be next. Most experts pointed to Sacramento.

Originally, the project was scheduled to be complete in 2022. Katrina accelerated that timeline.

Ultimately, the contingent of federal, state, and local partners completed the auxiliary dam and spillway four years ahead of schedule and delivered a savings of more than $400 million off initial project estimates.

BUILDING THE TEAM
While the collaborative team is proud of the many successes behind JFP, leaders with USACE Sacramento District point first and foremost to how the project team came together.

Human resources posed a big challenge early in the design of the project. In the end, employing the collaborative opportunities available to USACE served as one of the greatest lessons learned. In all, 22 USACE offices, four Bureau of Reclamation offices, three State of California agencies, 10 architect-engineer contractors, three prime contractors, the Sacramento Area Flood Control Agency, the National Weather Service, and National Marine Fisheries Service all played a role in getting the project to the finish line.

The JFP leadership assessed the overall needs, created a model, and went nationwide to ask for help—not just within USACE, but to other government agencies, industry firms, and even academia. But even with the brightest minds gathered from across the country, the challenge remained: how to get them all working together with the same common understanding of the overall mission? Co-location was the answer. Everybody—contracting officers, engineers, counsel, project managers, quality assurance, contractor teams—was all put in the same temporary office space, a combined campus at the construction site.

Having engineering and construction teams co-located with the contractors really streamlined communication. Instead of having to call or email someone and maybe wait a day for a response, people were able to just pop into the trailer next door or lean around the cubicle wall and address the issue immediately.

SPACE LIMITATIONS
Challenges existed on the construction site, in terms of the amount of real estate available to support concurrent activities. When the Katrina-influenced decision was made to move Phase IV construction of the spillway’s approach channel, chute and stilling basin up on the schedule, Phase III construction of the control structure was not yet complete. Now, two prime contractors under two separate contracts would have to share a limited workspace.
already occupied by the Phase III contractor, and both would have to work on their respective phase of construction concurrently rather than subsequently. This requirement was not considered in the original plan. But everybody involved understood that work between the two phases needed to be seamless.

One such solution was to help ease construction traffic from the concrete, aggregate and cement deliveries needed for the onsite batch plant. One of the contractors suggested constructing a temporary access bridge onto the site. The batch plant itself was a unique vertical design with a small footprint that maximized the limited space, keeping it out of the way of other construction operations and eliminating the need for any off-site equipment staging during construction. That, too, came at the suggestion of one of the contractors.

**A NEW STANDARD**

There was ongoing planning, information-sharing, innovation, and team building meetings that included both USACE and contractor personnel.

The joint nature of the team, along with innovative design and forecasting, and construction technology, led to completion of a state-of-the-art facility at Folsom Reservoir that set a new standard for Mega-Projects.

The success of JFP was all about collaboration and innovation. That was the biggest lesson learned. As David Thomas, USACE Sacramento District’s former Mega-Projects Center Director, who oversaw the project from 2012 until the completion of construction in fall 2017, said: “When you’re working on a project of this scale and magnitude, the worst thing you can do is not ask for help.”

Richard Brown is Senior Public Affairs Specialist, USACE Sacramento District; richard.d.brown@usace.army.mil.
As remotely piloted aircraft become a greater component of the nation’s air power mission, the Air Force Civil Engineer Center is working to ensure consistent, mission-ready supporting facilities and infrastructure.

By David Duncan, RA, LEED AP, Vistasp Jijina, P.E., M.SAME, Timothy Morrison, and Paul Womble

Laying the Foundation

The number of U.S. Air Force missions demanding support from remotely piloted aircraft (RPA) has been on a steady upswing since the mid-1990s. From gathering intelligence to conducting air strikes, RPAs have become integral to the nation’s defense.

Designing and building the infrastructure and facilities to house and operate these aircraft is critical to mission success. The Air Force Standard Design Program, which is managed by the Air Force Civil Engineer Center (AFCEC), is streamlining how these important assets are designed and constructed.

Laying the Foundation

The Air Force’s modern-day RPA program has its roots in the mid-1990s, when General Atomics Aeronautical Systems Inc. produced an “unmanned” aerial vehicle known as the MQ-1 Predator. Creech AFB, Nev., formerly known as Indian Springs Air Force Auxiliary Field, was chosen to serve as the home of multiple RPA squadrons. The Air Force selected Holloman AFB, N.M., as the primary training site.

In support of the RPA program, AFCEC (then the Air Force Civil Engineer Support Agency) designed and built Creech’s first RPA hangar in 2004. By 2007, use of RPAs was thriving and the 432nd Wing was activated at Creech as the Air Force’s first wing comprised entirely of RPAs.

With operations quickly ramping up, designing the necessary infrastructure and facilities for the relatively new aircraft, along with many unknowns associated with RPAs, proved challenging. The first operations facility was a pre-engineered metal building used to house five ground control stations. The inadequacies of the facility became apparent quickly.

RPAs are unique in many ways when compared to traditional Air Force aircraft. A primary difference was the ground control station as the aircraft’s cockpit. These large stations were shipped from the manufacturer—leaving the design and construction agents responsible for establishing the necessary communications support, heating, electricity, ventilation, and air conditioning to make it operational. The original, pre-engineered building design did not allow enough space for maintenance professionals to access the equipment.
Airmen from the 432nd Wing/432nd Air Expeditionary Wing and 799th Air Base Group gather at a hangar for remotely piloted aircraft at Creech AFB, Nev. The Air Force Civil Engineer Center is streamlining design and construction of these types of facilities. U.S. AIR FORCE PHOTO BY AIRMAN 1ST CLASS JAMES THOMPSON

As a result of the space limitations in the pre-engineered facility, AFCEC constructed a new operations facility in 2005, specifically designed with wider ground control stations for easier equipment maintenance. The new facility provided six stations, with an additional six added in 2006, to accommodate the growing mission.

All of the growing pains involved in establishing these initial facilities at Creech laid the foundation for RPA facility standard designs.

**STREAMLINING WITH STANDARDS**

Since 2016, the Assistant Secretary of the Air Force for Installations, Environment & Energy has required the use of an Air Force standard design for all facilities for which a standard design is available and applicable. If not available, design agents are required to assess whether the U.S. Army or other service branch has an applicable standard design for the proposed facility. Justification is required for projects that do not utilize standard designs.

AFCEC currently has 19 Air Force standard designs available. These fall into one of three categories: static, modular, or harvested. Static standard designs are not modular in nature and have a predetermined floorplan, such as pest management buildings. Modular designs are built around standard modules that can vary in quantity and building configuration (fighter hangars and dormitories for instance). Harvested designs are derived from actual Air Force construction projects, including the Large Airframe Two-Bay Flight Simulator, which was based on the KC-46 project.

When available, standard designs provide a host of benefits to the design team. They can jump-start a facility design by helping to establish a project’s scope and cost, and increasing planning and programming accuracy. Most available standard designs include an interactive programming spreadsheet that generates space requirements, using variables such as number of personnel, aircraft and firing lanes. The designs provide optimized, consistent and functional facility requirements, and also help manage customer expectations and reduce requests for changes during the construction process.

Standard designs are built to not be overly prescriptive by nature. They focus primarily on the functional relationships between spaces and do not prescribe features like the structural system, materials used, interior or exterior finishes or roof types. The Air Force Corporate and Installation Facility Standards, which must be referenced during an Air Force design project, need to specifically address these types of features.

A standard design for an RPA Squadron Operations Facility was added in February.

At Tyndall, AFCEC is in the initial stages of designing a new Mission Control Elements Operations Facility. The standard design has proven extremely beneficial for cost estimation during the planning charrette.
2018. During development, AFCEC coordinated with Air Combat Command and functional users at Creech and Holloman to establish requirements. The resulting modular RPA design incorporates lessons learned during construction of earlier facilities at the two installations. It also incorporates features including mobile cockpit units and servers, command and administrative suites, ground control station maintenance and operating support locations, and showers and recreation areas for staff. These high-tech systems require ample server space and the necessary infrastructure to support the accompanying computer systems and electronics.

A second RPA standard design, for an RPA Hangar/Aircraft Maintenance Unit, is currently in development. Because RPAs differ greatly from traditional Air Force aircraft, there are different considerations that must be accounted for.

RPA hangars do not have a standard requirement for an engine shop, since the manufacturer picks up the engines for most maintenance and repairs. Also, the small aircraft are considered “breakaway” planes. The components of the aircraft, such as the wings, landing gears, engine and props, can be removed and loaded into 50-ft long fiberglass crates for shipping. Removing the wings or engine requires the use of a bridge crane inside the facility. Typical aircraft hangar designs do not address the space needed for the disassembly process, nor do they account for the storage of multiple fiberglass crates.

Even though standard designs encompass the most accurate information available from industry and functional users, they are living documents—and they require regular maintenance and updates. AFCEC collects and analyzes the after-action reports from projects that have utilized the designs to address any concerns or make needed adjustments to the current version.

And now, with one RPA standard design available and another underway, AFCEC is getting a chance to put them to the test.

CONTINUOUS IMPROVEMENT

In January 2017, the Air Force selected Shaw AFB, S.C., as the preferred location to base a new MQ-9 Reaper Group, including mission control elements. Later, in November 2017, Tyndall AFB, Fla., was selected as the preferred location for hosting a new MQ-9 Reaper Wing. If approved as final, the new locations will require the design and construction of supporting infrastructure and facilities, presenting an opportunity to test the RPA Squadron Operations Facility and RPA Hangar designs.

At Tyndall, AFCEC is in the initial stages of designing a new Mission Control Elements Operations Facility. The standard design has proven extremely beneficial for cost estimation during the planning charrette. However, while the facility at Tyndall is slated to be twice the size of the standard design, thanks to the standard design’s modular layout, the design was easy to adapt and expand upon.

AFCEC will also be designing an RPA hangar for the final base. One issue that had not been previously addressed in the draft version of the RPA Hangar standard design was the use of methanol as a fuel additive for the planes. The additive requires a climate-controlled storage facility, which cannot be located within the hangar itself. Pending the outcome of a National Environmental Policy Act-required environmental analysis and final basing decision, a Launch Recovery Attack Squadron may be designed and constructed for Tyndall as well. The first-of-its-kind facility would form the basis for a new Air Force standard design.

The facilities at Shaw will include an operations facility housing two active squadrons and a headquarters facility. In addition, AFCEC will be managing construction of new facilities at Creech and Holloman, to include a new MQ-9 formal training unit operations facility.

As the RPA program expands, AFCEC’s standard design program is setting the Air Force up for success—enabling efficient and effective design and construction of facilities to support the mission.
NEARING NET ZERO AHEAD OF SCHEDULE

The California Military Department is constructing a new LEED Gold Consolidated Headquarters Complex that will lead the way in net zero energy implementation.

By William Ketcham, AIA, LEED AP, Arun Kaiwar, AIA, LEED AP, NCARB, and James Sasek, AIA, CSI, M.SAME

In 2012, California Gov. Jerry Brown signed an executive order to reduce greenhouse gas emissions and energy consumption. The regulation required that all state buildings constructed after 2025 be net zero energy. Today, still seven years in advance of this target, the California Military Department’s new Consolidated Headquarters Complex is on track to be one of the first large-scale, California-owned net zero projects. The $135 million project is targeting LEED Gold Certification and will be constructed to achieve a variety of sustainable goals to reduce environmental impact, optimize performance, lower energy and operating costs, conserve resources, and increase occupant satisfaction and productivity.

Onsite renewable energy will be generated by a photovoltaic array that will serve a dual purpose as parking shade structures. Net zero energy facilities produce more energy than they consume, and also contribute less overall drain on existing infrastructure than similar non-net zero buildings.

The California Military Department identifies as a community-based organization comprised of four pillars: California Army National Guard, California Air National Guard, California State Military Reserve, and California Youth and Community...
Programs. Bringing these services onto one campus will improve operational efficiency. Located on a 31-acre site adjacent to Mather Airport in Sacramento, the 285,000-ft² multi-building Consolidated Headquarters Complex will be home to a headquarters office, warehouse, emergency operations center, utilities building, bagging center, and access control point. It will provide space for 40 user groups. The design balances an aesthetic befitting its stature as a military headquarters that is also respectful of the surrounding community.

MODEL TO FOLLOW
California has long been committed to improving the energy efficiency of its government buildings. And state leaders continue to raise the expectations on energy efficiency and sustainability. On Oct. 7, 2015, Senate Bill 350: Clean Energy and Pollution Reduction Act was signed into law. This legislation established new clean energy, clean air and greenhouse gas reduction goals for 2030 and beyond. The bill codifies the clean energy goals outlined in the executive order issued in 2012, and has served as a key part of California’s strategy to address climate change.

Following the signing of Senate Bill 350, the Integrated Resource Plans of the 16 largest publicly owned utilities were to be reviewed to help ensure they reach the 50 percent Renewables Portfolio Standard target by 2030. The bill gave state energy agencies the authority to review existing programs, alter regulations, and reallocate funding to achieve the higher efficiency mandate. Then in September 2018, Gov. Brown signed a new law, Senate Bill 100: The 100 Percent Clean Energy Act, which mandates the state utilize 100 percent clean electricity by 2045. Separately, he issued an executive order that seeks to achieve complete carbon neutrality in the state by 2045. These additional targets continue to emphasize that investments in the Golden State to achieve net zero will remain favorable.

DESIGN AND ENGINEERING
Stantec has been intricately involved in the planning and design of the new headquarters complex—providing architecture, interior design, net zero consulting, sustainability, energy modeling, landscape design, acoustics, lighting, security, and information and communications technology design services and support.

The modernized facility will boast security features that help it meet current Anti-Terrorism/Force Protection standards while also delivering environmental benefits. Building windows are designed in response to the sun orientation. East and west windows are tall and thin in deep-set facades, allowing for more shading. South-facing windows feature horizontal sunscreens to prevent direct sunlight from entering the building. North windows have vertical blinds to shade early and late sun around the summer equinox.

Building windows are designed in response to the sun orientation. East and west windows are tall and thin in deep-set facades, allowing for more shading. South-facing windows feature horizontal sunscreens to prevent direct sunlight from entering the building. North windows have vertical blinds to shade early and late sun around the summer equinox.

Heating and cooling is primarily done through hydronic radiant floor piping that allows the use of mass coupling. Facility mechanical systems also capture rejected heat from required exhaust systems. Ventilation requirements depend on a variable air volume system. Limiting the air system to ventilation and disengaging it from heating and cooling reduces ductwork sizes up to 70 percent and has enabled the design team to reduce building volume. Using hydronics to distribute heat and cooling further contributes to overall efficiency.

In addition to the energy efficiency component, the Stantec design team was tasked with ensuring the campus complements the adjoining planned development community. The design solution balances this sensitivity with an aesthetic that is befitting its stature as a military headquarters.

At the same time, the goal was to make this more than simply a military facility. The facades are well articulated with a combination of brick veneer, metal panels, and fenestrations. All the buildings on the campus are designed with the same architectural principles, broadcasting a cohesive campus aesthetic to the surrounding community. Through the material palette, landscaping and positioning of the building, the residential and nearby retail developments are respected. The primary entrance to the building is designed to be public and open and friendly. It is more like a corporate headquarters than a typical military building. The design of each of the facades is specific to the building orientation and aids with the daylight harvesting.

The new headquarters complex will go a long way toward ensuring the California Military Department is an effective and energy-efficient force. Leadership has worked closely with the contractor, Walsh Construction, and Stantec throughout the process, and is confident the facility will set a standard for state agencies for years to come.

ENSURING USABILITY
To achieve the benefits of a net zero energy facility, where energy usage on an annual basis is less than or equal to the amount of renewable energy generated on the site, those interacting with the building are part of the process once the doors open. Following design and construction of a net zero project, the next step is user education.

Base leadership has embraced the project’s goals and will work with the delivery team to monitor building operations to ensure long-term success and compliance. Groundbreaking was held in May 2018. The facility is set to open in 2020.

William Ketcham, AIA, LEED AP, is Principal, Arun Kaiwar, AIA, LEED AP, NCARB, is Principal, and James Sasek, AIA, CSI, MSAME, is Principal, Stantec. They can be reached at william.ketcham@stantec.com; arun.kaiwar@stantec.com; and james.sasek@stantec.com.
The expanding 308th Guardian Angel Squadron at Patrick AFB, Fla., needed a new facility that would meet its unique training and equipment requirements.

By Doug Brown, P.E., PMP, LEED AP, M.SAME, and Richard Hammert, AIA, LEED AP, M.SAME

The 308th Guardian Angel Squadron, located at Patrick AFB, Fla., has a uniquely critical and growing mission with the Department of Defense. This squadron of Combat Rescue Officers, Para-Rescue Jumpers, and Survival, Evasion, Resistance and Escape Specialists is dedicated to lifesaving recovery missions during peacetime and war, and is called upon to provide aid to civilians before, during and following natural disasters.

Due to substantive growth in its number of personnel, the Guardian Angel Squadron required a new facility to carry out its varied mission responsibilities. What had been a 25-member unit had expanded to more than 100 members, and the existing support structure was no longer large enough or functionally appropriate to its personnel or mission. More indoor space was needed for the squadron’s training activities and storage requirements—and it all needed to be protected from an extreme environment.

In 2017, the joint venture of Woolpert and RS&H was commissioned to design a facility that would serve the squadron’s standard and specialized functions—from warehouse to training to office spaces to a 100-ft parachute drying tower and a training pool. The building would be a home base for the asymmetrical needs of a reserve unit and stand up to the hurricanes, flooding and corrosion that come with residing close to sea level alongside the Atlantic Ocean.

To accommodate these needs and to meet military specifications for security and sustainability, the new building incorporates resilient design strategies that will promote its function and withstand adverse weather in a single 63,600-ft² space.

**PARACHUTE DRYING TOWER**

The building’s most distinctive space, which drove other design decisions, is a 100-ft tall parachute drying tower. The tower will be capable of drying as many as 100 parachutes within a 24-hour period to keep up with training and prepare for the next mission.

The tower design required a basin that would facilitate rinsing saltwater or dirt out of wet parachutes, which can weigh up to 200-lb and are then hooked onto a hoist and raised to the top of the tower for drying. A mechanical room next to the...
in the building, the personal gear of unit members, a weapons vault, and three unit type codes of deployable equipment.

What had been a 25-member unit had expanded to more than 100 members, and the existing support structure was no longer large enough or functionally appropriate to its personnel or mission. More indoor space was needed for the squadron’s training activities and storage requirements—and it all needed to be protected from an extreme environment.

INCRESSING RESILIENCY
Within the project's program and budget, the design team weighed the lifecycle cost of increased resiliency with the potential savings gained through risk reduction from extreme weather events. However, quantifying the cost benefits of resiliency or risk reduction to justify additional construction costs is a recognized need in the industry.

Collectively, Guardian Angel airmen, USACE, and the design team were hard-pressed to put a number on the replacement cost of equipment or to the savings to the government of preventing flood damage. While this made it difficult to do a lifecycle cost analysis to justify resiliency upgrades, in this case, the project budget supported the measures. The value was recognized in protecting the expensive equipment stored in the building. Users can install the gates, which come in panelized sections, into each door before a storm. The modular system was chosen so that gates could be stacked to 3-ft high, and more gates can be added if needed.

Recognizing that water infiltrating the parachute tower would not cause damage and could be dried out, the team also designed flood-proofing between the tower and the adjacent large equipment storage area. The gates were designed into the door connection between the main building and the parachute tower, instead of at the parachute tower's exterior door.

HONORED TO SUPPORT
Throughout the project, the designers worked in coordination with personnel at Patrick AFB, members of the Guardian Angel Squadron and USACE Louisville District to ensure their needs will be met.

The members of the joint venture who designed the facility said it was an honor to serve those who make the difference between life and death for so many. Construction is expected to be completed in 2020.

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CONDUCTING TRAINING DIVES
One of the unique needs of the 308th Guardian Angel airmen is a training pool for conducting diving and physical fitness exercises, which enables them to consistently be ready to deploy. Using the base pool or going elsewhere has proven inconvenient and costly due to the extensive training required.

A newly designed, 18-ft deep training pool will be placed partially below grade atop a concrete base. Raising the pool will account for water table and environmental concerns, while addressing security issues by limiting unauthorized access. Stairs and a hoist system to lift rafts or other training equipment were added to the design, along with a sustainable system for cleaning and maintaining the pool without excess chemicals.

Design & Construction
DESIGN-BUILD FOR CIVIL WORKS

While utilizing design-build for Civil Works carries a number of unique challenges, adhering to several key recommendations can lead to successful project outcome.

By Col. Miroslav Kurka, P.E., PMP, FSAME, USA (Ret.)

While design-build is regularly used for military construction projects executed by the U.S. Army Corps of Engineers (USACE), less common is its application for Civil Works. However, the usage is increasing because delays in budget approvals are in turn delaying budget allotments to districts to later in the fiscal year. Design-build allows districts to obligate the entire design plus construction funding under one award, a more effective way to meet year-end requirements with very late appropriations.

The biggest values of design-build can be saved time in procurement and a potential for value engineering review and project phasing. Additional benefits include a “turn-key” construction process, especially when USACE’s internal engineering and contracting resources are overstretched.

DIFFERENCES AND SIMILARITIES
To date, Mead & Hunt’s design-build experience leans heavily toward food and beverage development projects and transportation infrastructure. Although our involvement with USACE on design-build is more recent, some key differences between the approach in the commercial sector and the USACE process have emerged very quickly.

First, USACE design-build requests-for-proposal are generally much more prescriptive than those for non-governmental clients.

Generally, USACE does not authorize construction until 100 percent of the design is approved and a USACE design-build project generally requires multiple design reviews, often at 65 percent, 95 percent, and 100 percent. Its designs must
meet the requirements of all applicable USACE engineering manuals, regulations, and technical letters. And it may require an independent technical review or peer review of the design relative to project size.

**Military Construction.** Mead & Hunt first completed a design-build contract for a fire station at Fort Polk, La. USACE Fort Worth District and the base were very satisfied with the final design and construction, deeming the project a success. Still, the architecture-engineer team learned much through the experience. First, the ability to reduce design fees in USACE design-build is limited because the agency generally cannot accept a reduction in the number and detail of drawings, nor do they allow time saving by overlapping design and construction phases.

Communication among the end-user, contracting officer, builder and designer requires extra attention and effort. Furthermore, to fully realize the benefits of design-build and be profitable requires a design team that has solid experience with the builder.

**Civil Works.** In 2015, Mead & Hunt tackled a Civil Works project as the design-build team engineer for the design and replacement of two tractor gates (one flood and one emergency) out of the six sets at Denison Dam, which was first built in 1943.

Alltech Engineering out of Minnesota, which had replaced three previous sets of gates, was the chosen contractor. Alltech selected Steel-fab Inc. for gate fabrication because it had fabricated the previous gates. Analysis for fatigue and fracture according to the USACE Engineer Technical Letter 1110-2-584, Design of Hydraulic Steel Structures, was essential. This manual contains extensive requirements for evaluating and documenting fracture critical members of hydraulic steel structures. This design also required a peer review by another district.

**COMPARING LESSONS LEARNED**

The Denison Dam project reinforced the lessons learned at Fort Polk with a few additional specific to Civil Works design.

- Design-build for Civil Works projects is less common than Military Construction and requires different qualifications. Therefore, most architecture-engineering firms cannot have a dedicated Civil Works design-build team, or use their Military Construction design-build team to complete a Civil Works design.
- Civil Works designs for dam safety or flood control receive extra scrutiny.
- Peer review by another district or one of the USACE Centers of Expertise may be necessary depending on the project size and type.
- The ability to save costs using standard components is limited because every project is unique.
- USACE districts often require an extensive design report together with plans and specifications to fully document all modifications to their projects.

**BENEFICIAL OUTCOMES**

The benefits of design-build can still outweigh potential challenges. Funding design and construction under one awarded contract expedites projects receiving late appropriations.

Having a “turn-key” construction process, especially when internal engineering and contracting resources are overstretched, is another benefit to USACE.

Finally, simultaneous work by the designer and contractor throughout improves the value and constructability of the design. It can also assist in resolving issues during construction.

**PROPOSAL THROUGH EXECUTION**

Meeting the objectives of USACE Military Construction and Civil Works design-build projects is challenging. But the right recommendations during the proposal and execution phases can help to overcome issues that could imperil a project.

**Proposal Phase.** The engineer must carefully review the scope of work and all referenced engineering publications together with the construction contractor and fabricator to fully understand the effort required and adequately account for it in the bid price. The contractor, in coordination with the engineer, must submit a request for information to clarify uncertainty about requirements. The engineer must work closely with the construction contractor and fabricator to develop a realistic design, fabrication and construction schedule. The entire design-build project team needs to understand the goals, objectives, timelines and procedures of all approving entities.

**Execution Phase.** The design-build project manager should hold an in-person kick-off meeting with key design team members (engineer, construction contractor, fabricator) and key district personnel (contracting officer, contracting officer’s representative, technical/project manager, and technical/safety leads) shortly after contract award. During the meeting, the team should review the scope of work to ensure everyone knows the expectations of deliverables, and also review the design and construction schedules to understand USACE submittal review timelines, and determine if the design will be peer reviewed by another district. Additionally, it is important to address communication protocol and requests-for-information. The design-build project manager should schedule routine (at least bi-weekly) meetings with the design team, construction contractor and fabricator to update status and identify and resolve issues. The project manager should document all correspondence, meetings, and telephone calls with the district. If confronted with a design challenge, they should immediately notify the contracting officer’s representative and schedule a meeting with the district to present the challenge and potential solutions. Above all, the entire design-build team must ensure continued correspondence and cooperation between the designer, the contractor, the contractor’s fabricator and the district.

**SUCCESSFUL PROJECT DELIVERY**

Design-build is one of the principle project delivery systems in the construction industry. USACE already uses design-build as its primary procurement method for Military Construction.

As more districts use design-build for Civil Works, successful application of these recommendations will lead to greater instances of excellent project outcomes.

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ENSURING ALASKA’S Strong Military Future

As the U.S. military enhances its strategic capabilities in the Arctic, engineers and constructors specializing in cold climate construction continue to support the “most important strategic place in the world.”

By Col. Patrick Coullahan, P.E., PMP, CFM, FSAME, FNSPE, FASCE, USAF (Ret.)

The Alaska District of the U.S. Army Corps of Engineers (USACE) continues to build and preserve Alaska’s military might, working alongside other Army elements, the U.S. Air Force, and the Missile Defense Agency (MDA) as we enter into a new era of hostility to the United States and allies around the world.

Since Billy Mitchell first led the way, it is certain that Alaska is and always will be one of the greatest strategic places on the globe for conducting critical military operations, ensuring adequate training and deployment capabilities. The current projects and plans reflect that understanding and commitment.
China, Russia, Iran, North Korea and other nations—overtly and likely covertly—display signs they would like to expand their influence, and often make moves to that effect. Many of America’s would-be adversaries have their eyes on the Arctic, and its vast natural resources and shipping opportunities, and as a result are surely intensifying their basing growth and operational presence.

Targeting the United States in the Arctic is well within their conceivable game plans. Strong Alaskan military basing enables a robust deterrent to keep us resilient, secure, and in control.

COLD CLIMATE CONSTRUCTION

Alaska is often cited as an extremely difficult place to build new facilities, utilities, and systems—but for many decades, USACE Alaska District, its partners, and an experienced contractor base have learned how to get the jobs done right despite the environment, elements, logistics, schedules, competition for resources, and tight fiscal budgets.

Year-round construction has become normal the past couple decades, as project planning, award, design, and construction have been successfully mapped out to account for the added constraints of Alaskan Arctic projects. Modern construction in The Last Frontier relies heavily on a mix of what we learned in the past, along with new tools for project planning, design and construction. Contractors and in-house staff are expected to be safe and proficient in a wide variety of construction and logistics techniques as well as engineering and construction skills, so they are prepared for what might be encountered.

ADVANCING PROJECT DELIVERY

Alaskan engineers and construction personnel now fully employ computer-aided designs, effectively use resource-loaded construction schedules, ensure all environmental requirements are met, can respond to a wide array of acquisition methodologies, enforce safety requirements, contemplate the needs of energy efficiency and principles of heat transfer, utilize modern materials, and meet current building codes and routinely conduct systems commissioning. They have mastered how to design and construct utilities in a cold climate, and when to use utilidors or other features that assist with operations and maintenance. They also routinely address facilities and equipment that rely on high-altitude electromagnetic pulse shielding. Most importantly, they are able to develop projects in a manner where they effectively build year-round through an experienced understanding of how to protect materials in shipment, storage and placement; design appropriate mixes and place concrete; avoid conditions that could lead to propagating mold; and know about intermittent permafrost and techniques to use such as piles, dynamic compaction, or deep foundations, and the necessary engineering skills to apply in any type of frozen ground construction.

As a result, in recent years, major initiatives including the heralded Grow the Army program, the Air Force C-17 and F-22 basing, and MDA’s Ground-Based Midcourse Defense System have all been successfully undertaken in Alaska, while addressing complex problems well before they became showstoppers. Next is a move to an era of F-35 basing and critical improvements and expansion of MDA capabilities throughout Alaska.

EXPANSION PROJECTS UNDERWAY

The F-35 basing at Eielson AFB, located just outside Fairbanks, is a remarkable expansion of military state-of-the-art fighter capability. The base provides a significant platform to operate from and is next door to the Joint Pacific Range Complex, which enables specialized training with its unique ranges and significant expansion space.

Numerous projects are now underway to provide the best operational and support capability to this tremendous airframe and fighting force.
Numerous projects are now underway to provide the best operational and support capability to this tremendous airframe and fighting force. Among them are a few projects that have changed direction or scope, because renovation of some existing facilities proved to be unfeasible, and required a change in Military Construction plans. MDA and USACE successfully bedded down the Ground-Based Midcourse Defense Test Bed System and achieved ready to deploy status in 2004, years ahead of projections. Since then, the agencies have made systematic and incremental improvements before this newest stage of modernization of radars and expanding missile fields to reach its planned capabilities.

Currently, Fort Greely, located south of Eielson, is home to several interceptor missiles, command and control facilities, and operational, self-sustainable assets. Now, expanding missile field work, silos, and mechanical/electrical support facilities are in the works and moving steadily along. At Clear AFS, to the west, a new Long Range Discrimination Radar & Operations Facility is emerging, along with needed host base support. The system and operational facilities are to provide vital Homeland Defense Against Long-Range Missile Threats and Space Situational Awareness. Construction of this new infrastructure is one of the most complex efforts initiated in the interior of Alaska, and when complete, will ensure we have the resources our nation needs.

MAINTAINING DEFENSE SUPPORT
The Alaskan-based missile defense system is a critical component in the American deterrent effort against the use of missiles against our country, Defense Secretary James Mattis said on a recent trip to Alaska. “It is a very sobering reminder to our adversaries that we are able to defend ourselves,” he said, and in regards to the missile defense system, remarked, “I am absolutely confident the missile defense system will work.”

In 2018, The Honorable Lucian Niemeyer, Assistant Secretary of Defense for Energy, Installations & Environment, toured new construction projects valued at close to $1 billion at Eielson AFB, Clear AFS, Fort Greely, and Fort Wainwright—all located in the greater Fairbanks area. Meeting with leadership at each base and visiting construction sites under the management of USACE Alaska District, he saw the Defense Department’s military capacity in the Far North. “The Alaska area is of strategic importance in the entire world,” Niemeyer said. “It is significant where the United States can reach out and project power from Alaska.”


The views expressed are those of the author and do not reflect the official policy or position of the U.S. Army Corps of Engineers, Department of Defense, nor the U.S. Government.
PRESERVING HISTORY THROUGH DESIGN-BUILD

While there are challenges in applying design-build to historic renovation projects, the right partnership and processes can overcome them, leaving the positive benefits that attract owners and contractors to this delivery method.

By Matthew Chalifoux, FAIA, M.SAME

Over the last 25 years, design-build has been increasingly utilized for project delivery—especially at the federal level. In 2013, data collected by RS Means Market Intelligence for a study commissioned by the Design-Build Institute of America showed that over 40 percent of non-residential construction market share was being delivered through design-build, just 10 percent less than the traditional design-bid-build process. Since 2013, the gap between the two has continued to narrow. Further, design-build is being used on an increasingly broader range of project types, including historic preservation.

Over the last 30 years, historic preservation projects have become much more common and accepted, but there are certain aspects of these specialized projects that vary from typical construction. First, they involve an existing building that has been identified as historically significant. Second, before a project can be properly scoped and budgeted, a deep understanding of the physical structure and relevant documentary resources must be gathered to ensure that design decisions and the project approach will not negatively impact the historic property. Finally, historic preservation typically requires review and approval from an outside agency, such as a local historic preservation commission or a State Historic Preservation Office, which can result in modifications to a proposed design.

To an owner, there are three key benefits of utilizing design-build: managing a single contract; greater cost and schedule certainty; and cross-discipline creativity that can provide cost savings, expedited schedules, and innovative solutions.
To realize the full benefit of the design-build process, the project sequence is collapsed. The proposal comes from a combined design and construction team and includes all planning work, design, documentation, and construction. Key to success is the development of a request-for-proposal that has sufficient information to allow the design-build teams to submit a fair and comprehensive proposal. This bridging document is typically developed by a separate design team that is precluded from bidding on the full project. Bridging documents are developed to a preliminary or schematic design level, allowing bidders to develop solutions that meet the project requirements as efficiently and cost effectively as possible.

Applying design-build to a historic preservation project raises the question of when and how detailed building evaluation and documentary research is embedded in the process. If this is required of the design-build team, it will not have this information when developing the fee proposal, which can result in the inclusion of allowances or qualification statements, eliminating the cost surety that the owner seeks. If the investigative work is done as part of the bridging documents, it is being executed by a separate team and the project loses continuity of knowledge when the design-build team is brought on board. If the investigative information is thorough and well organized, this transfer may be smooth; but if there are gaps in the information that are not filled until the design-build team has started work, it can also negatively impact the project cost and the schedule.

A pair of recently completed historic preservation projects involving EYP Architecture & Engineering illustrates the challenges of using the design-build process, but also the potential benefits.

GRANT HALL, FORT MCNAIR
Grant Hall, located on the grounds of Fort McNair in southeast Washington, D.C., is a remarkable story of survival. Constructed around 1832 as an extension of the Federal Penitentiary built in 1829, the building played a key role in American history. From May 9–June 30, 1865, a Military Tribunal convened on the third floor of Grant Hall in judgement of the eight conspirators arrested in the assassination of President Lincoln. Just five years later in 1870, the exterior and interior of the building were radically altered to reuse the building as officers’ housing, turning the Georgian revival penitentiary into an Italianate residential structure.

In 2010, EYP was hired as part of a design-build team with contractor Polu Kai Services to renovate Grant Hall. Overseen by the Baltimore District of the U.S. Army Corps of Engineers, the project included recapturing the 1865 appearance of the third-floor trial room. The design-build team was provided a set of bridging documents that provided a schematic level of design. A critical element of the third-floor design was “reclaiming” a series of columns that bifurcated the trial room, visible in period lithographs. When the team visited the space prior to submitting the proposal, concerns were raised about the accuracy of the proposed design in the bridging documents, particularly as it related to the location of the columns and the potential structural implications.

Discussions with the owner revealed that the team which developed the bridging documents was offered limited access to the building for investigative purposes. This gap in detailed physical analysis required them to make assumptions, including that the columns were not located in the line of the masonry wall and to recreate them would require structural modifications to both the floor and roof impacting the cost of the construction. A benefit of working as a design-build team was that EYP-Polu Kai could self-perform the investigative removals quickly and cost effectively. Ultimately, the findings confirmed the position regarding the location of the columns. A revised schematic design, including structural modifications, was developed and submitted for review with a modified cost proposal. Working with the owner, the team then was able to evaluate the scope and approach to the entire project, allowing the reconstruction of the trial room to be accomplished within the original budget.
HISTORIC WATCHBOX, WASHINGTON NAVY YARD
The Historic Watchbox at the Washington Navy Yard in southwest Washington, D.C., is a strong testament to the concept of adaptive reuse. Constructed in 1842 just inside the main gate of the Navy Yard, this diminutive wood frame structure, with a footprint of only 26-ft by 29-ft, served as the check-in point for visitors to the base.

As the Navy Yard expanded in the late 19th Century, the need for the Watchbox was eliminated and in 1906 the building was removed to make way for a new fire house. Surprisingly, it was not demolished. Rather, a portion of the building, the 13-ft square core, was floated down the Potomac River for use at the Naval Support Facility Indian Head. In this reduced size, the structure was moved multiple times within the Indian Head facility, serving as the main telephone exchange and ultimately as a storage shed for the grounds crew.

In 2014, EYP was contacted about the Watchbox by a frequent design-build partner, Summit Construction, which was already working with Naval District Washington to remove a deteriorating historic pier on the Anacostia River at the installation. As a contributing element in the Washington Navy Yard Historic District, the removal of the pier went through a Section 106 review process, which resulted in a Memorandum of Agreement covering mitigation for removal of the pier. There was one paragraph in the agreement that required the relocation of the Historic Watchbox to the Navy Yard and restoration to its 19th Century appearance. A narrative description of the scope of the restoration was provided, but no drawings or specifications.

When EYP was engaged, the proposal included evaluation of the surviving building fabric to correlate the physical evidence with the historic photographs and narrative scope. The evaluation identified two aspects of the building that varied from the restoration scope. First, the door and window openings had been moved on two of the elevations. Second, the existing flooring and structure were a later modification and did not exist at the Navy Yard. A summary report and a revised schematic design proposal was developed by and submitted to Naval Facilities Engineering Command for review and to be shared with the State Historic Preservation Offices in both Maryland and the District of Columbia. All the review authorities approved the adjusted design.

By October 2015 the historic Watchbox had been carefully floated back up the Potomac and reinstated as part of the Washington Navy Yard, just over 100 years after it had departed.

EFFECTIVE PARTNERSHIP
These projects illustrate the power and challenges of utilizing design-build when working with historic buildings. In both cases, design and construction capabilities were leveraged when issues arose that allowed the team to course correct. Working in partnership, the teams were able to deliver projects that were sensitive to the historic building while fitting within a cost and time model that was critical to the owner.

At the same time, both cases illustrate the risks of engaging a design-build team without execution of sufficient investigative work demonstrated in the bridging documents. The impact of these gaps in knowledge were mitigated by the relatively small size of the projects, but as much larger and complex historic preservations are executed using design-build, the potential cost and schedule exposure increases dramatically.

Through proper planning and by engaging experienced, qualified design-build teams, these risks can be minimized to the benefit of owners and their valuable historic buildings.

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The renovation of Pershing Barracks has involved complex upgrades to meet current codes, including modern construction techniques and replacement of outdated systems. PHOTO BY BRENDAN McGIBNEY PHOTOGRAPHY
RENOVATION of Pershing Barracks

A renovation project to modernize Pershing Barracks at the U.S. Military Academy took great care to preserve the historic integrity and design of the 123-year-old building.

By Tara Goodman and David Kristjanson

West Point, on the banks of the Hudson River, dates back to the Revolutionary War and has served a strategic role throughout American history. Located 50-mi outside of New York City, this military post is one of the oldest continuously occupied installations in the nation.

Kokolakis Contracting began a collaboration with West Point more than 20 years ago. This partnership includes the design and construction of Thomas Jefferson Hall, Randall Hall, Hoffman Press Box, Kimsey Athletic Center, and restoration of five Barracks included in a $600 million Barracks Upgrade Program as well as work on the U.S. Military Academy Preparatory School.

After the successful renovation of MacArthur Long, MacArthur Short, and Scott Barracks, Kokolakis was awarded Pershing Barracks followed by Eisenhower Barracks in 2017. Pershing Barracks has been the most challenging by far, but also the most rewarding.

Originally constructed from 1891 to 1895 for academics, the building is significant for its architecture, which incorporates elements of Gothic, Tudor, and Romanesque styles, and for its association with the architect Richard Morris Hunt, who designed the building and oversaw construction. Hunt is renowned for his design of The Metropolitan Museum of Art, the Biltmore Estate in Asheville, N.C., The Breakers in Newport, R.I., the Statue of Liberty pedestal, and the master plan for Columbia University's Morningside Heights campus.

The historic barracks currently being renovated is named after General of the Armies John J. Pershing. But before becoming Commander of the American Expeditionary Forces in World War I and a military icon, Gen. Pershing was a cadet at West Point, entering in the fall of 1882 and graduating in 1886.

COMPLEX UNDERTAKING

The four-story, 124,692-ft² renovation of Pershing Barracks (which was renamed in 1959 from the West Academic Building as part of a renovation effort then) has involved complex upgrades to meet current codes, including modern construction techniques and replacement of outdated systems. Energy-efficient features include exterior wall spray foam insulation, insulated windows, electronic controls for heating, ventilation and air conditioning, LED lighting and low-flow plumbing fixtures.

The barracks is designed to achieve LEED Silver certification. Ultimately, the modernized Pershing Barracks will accommodate 135 rooms and 270 cadets, with six tactical officers and tactical non-commissioned officers.

The sustainable design seamlessly incorporated Force Protection initiatives. Anti-Terrorism codes implemented in the late 1990s aimed at protecting service men and woman from a terrorist attack. Upon completion, the newly renovated barracks will comply with current standards to include blast resistant window systems. Every Anti-Terrorism/Force Protection window is structurally reinforced with steel tubes that span from floor to ceiling.

As a building that was first completed in 1895, its structural layouts were not configured with ample space or passageways for modern building systems. Structural flooring consists of terracotta masonry archways that span between floor beams as low as 7-ft/7-in, with 60-in thick structural brick masonry walls located throughout the floors. As a result, the mechanical/electrical/plumbing coordination was one of the largest challenges on the project.

Kokolakis helped spearhead a complex plan to route new utilities using existing and new penetrations that required steel lintels at large penetrations in bearing walls (some of which span up to 5-ft) and contend with changing slab heights throughout the basement and crawl space. Every new penetration between the existing terra cotta floors required an individual steel sleeve, or box, to maintain
the structural integrity of the deck. Each location had to be field measured and four pieces of steel fabricated, fitted and welded together to make the box, before piping, conduit, ductwork, and other systems could be installed.

Through the use of BIM, the piping, ductwork, conduit, and other systems were laid out both to resolve traditional construction challenges and conflicts, and to identify all penetrations at the structural floors and walls. Importantly, the BIM models allowed for the timely identification of systems that would be driven below code minimum elevations by standard lintels, providing an opportunity to employ lintels with center slots that maintained clearances for the modern systems without compromising the structural integrity of the original construction. The ability to perform these layouts and resolve these conflicts in advance of field installation allowed for the maximum efficiency of the numerous structural repairs and prevented the occurrence of many extensive delays on the project.

Furthermore, that Kokolakis led the extensive coordination and routing of new utilities through 60-in bearing walls without sacrificing the structural integrity of the building and maintaining a safe workplace was a major feat. The top priority was maintaining all the historic preservation while bringing the mechanical and building management systems to a 21st century level of efficiency and functionality.
SAFETY ASSURANCES

Each day, as many as 200 people were on site to execute the renovation. Working in a building with unreinforced terracotta floor systems can create unusual safety challenges when performing interior selective demolition. In order to protect the safety of construction crews, Kokolakis utilized a remote-controlled demolition machine manufactured by Brokk Inc.

This specialized equipment allowed for detailed selective demolition without exposing workers to hazardous conditions. This safety measure was employed when the demolition crew shored the first floor steel deck beams from below, which were determined safe for reuse by the structural engineer. Once the shoring was in place, the demolition on the basement level was completed. A hydraulic arm and traction rollers allow the demolition machine to perform precise work in varied terrain, while the operator stays safely out of the way.

At more than 120 years old, Pershing Barracks contains many unique design elements such as the arched terracotta flooring on each deck. The two faces of the clock tower have been entirely restored. While the exterior will maintain its historical integrity, the inner workings, which have not been operable in some time, will be replaced with a new electric model.

The clock tower’s missing gargoyle also was returned to its proper location at the top. During this process, the contracting team dismantled the primary granite retaining wall that was surrounding the building, in order to correct the bowing, and then reconstructed the wall, maintaining the original location of each piece of granite.

READY FOR TOMORROW

Maintaining the historical design elements of Pershing Barracks and overcoming the spatial constraints while adhering to a strict budget and timeline were challenging—but the commitment and culture of the contracting team with the support of the U.S. Army Corps of Engineers made the renovation a reality.

The first cadets to live in the newly renovated barracks are expected to move in by the end of 2018.

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A SURPRISE DISCOVERY

Historic renovation work can bring unexpected surprises. A fascinating discovery during the Pershing Barracks project occurred in the basement, when what appeared to be historic documents were found within the walls. On the morning of Thursday, Oct. 5, 2017, workers at the site discovered a number of historic documents and contacted the U.S. Army Garrison West Point Cultural Resources Management Office.

Found in a pipe chase, the documents were then removed to the laboratory of the Cultural Resources Management Office for analysis. They consist of four letters and a newspaper, all dated 1893. All are associated with Jacob Detwiler, who, according to information contained in the documents, was the foreman of the stonemasons constructing Pershing Barracks. While three of the letters are correspondence with a woman named Sadie, a resident of Elwyn, Pa, with whom Detwiler was romantically involved, the fourth letter is his resignation letter, which he evidently placed within the pipe chase in the hope that it would later be discovered. The newspaper is a copy of the Philadelphia Record for Feb. 3, 1893.
A Unique Renovation
AT HERMANN HALL

Once a 19th Century luxury resort and rumored to be one of the most haunted places in Monterey, Calif., the recently renovated Herrmann Hall is now a U.S. Navy-owned hotel at the Naval Postgraduate School.

By Joe Mark, M.SAME

First built in 1880, Hotel Del Monte was one of the finest luxury hotels in the United States, attracting wealthy and influential guests, from U.S. presidents and world leaders to business titans and Hollywood’s early stars. At its peak, the resort in Monterey, Calif., hosted the likes of Theodore Roosevelt, Clark Gable, Amelia Earhart and Ernest Hemingway.

However, the hotel’s story took a turn—along with the rest of the world—with the dawn of World War II. The U.S. Navy requisitioned Hotel Del Monte, turning it into a pre-flight training school and eventually purchasing the property in 1947.
Today, the historic hotel houses servicemembers and their families who visit the Naval Postgraduate School at Naval Support Activity Monterey. Now known as Herrmann Hall, the historic building contains offices, event space and the Navy Gateway Inn & Suites for the school.

DESIGN CHALLENGES

Constructed in 1926, Herrmann Hall was due for upgrades, but renovating a four-story, nearly 100-year-old building is unlike any other construction project. U.S. Army Installation Management Command hired Stellar, an architecture, engineering and construction firm based in Jacksonville, Fla., to renovate the building’s 72 standard guest rooms and four distinguished visitor suites.

Not only did Stellar have to adhere to strict historic preservation standards while bringing the hotel rooms up to code, but existing designs and plans for the structure were not available. Without as-built drawings, the design team had no idea what was behind the walls or where piping and electrical wiring was located.

To better understand the existing space, the team utilized laser scanning technology to generate a 3D model of the second and third floors. The millions of data points, combined to form a point cloud, helped measure the corridors, guest rooms and bathrooms to a high degree of accuracy prior to starting construction.

However, the measurements also revealed another surprise: The floor plan dimensions varied from guest room to guest room. They did not do “cookie-cutter” hotel rooms in 1926, meaning the team would have to custom-design 72 individual rooms.

PRECARIOUS SPACES

The existing bathrooms reflected the century-old design. They had just enough space for a sink, a cast iron tub and only 2.5-ft for a toilet. To update the bathrooms and bring them into compliance with Americans with Disabilities Act requirements, the team had to reconfigure the sanitary and plumbing lines.

It was not until crews started removing walls that the team discovered structural concrete beams. This made installing new piping much more complex. Workers had to reconfigure all of the existing infrastructure—from the bathrooms down to the basement—and navigate around those concrete beams.
Ultimately, each bathroom had to be completely revamped around the utility chase, and the footprint expanded to be more accessible. To remove the old cast iron sanitary piping, crews had to navigate a cavernous crawl space between the first and second floor, an unusual architectural feature not found in modern-day hotels. Crawling through these spaces was chilling, and not just because Herrmann Hall is rumored to be haunted.

The attic-like crawl space ranged in height from 5-ft up to 12-ft. Workers would move through the space while cutting piping, a difficult job without the added constraints of the second-floor guest rooms overhead and an ornate lobby and ballrooms below. One wrong move and a wrench or pipe could come crashing through the painted plaster ceilings of the hotel’s historic ballrooms.

On-site quality control and safety managers were very much a part of this project on a daily basis. The team was able to successfully replace all the piping for the second and third floors, without incident, all while the first and fourth floors remained operational.

**CORRIDOR CONCERNS**

One of the more unique elements of Herrmann Hall is the corridors. Stellar was tasked with updating these spaces as well, which included hiding exposed electrical conduits and wiring.

The original plan was to lower the entire ceiling in the corridor by 3-in to mask the electrical infrastructure, but according to the state historic preservation officer, the original crown molding could not be disturbed. Not only that, but the textured walls and the mahogany baseboards, doors and transom frames had to be preserved as well.

Instead, 6-ft of ceiling was removed from the center of the 8-ft wide corridor, preserving the molding and a 1-ft edge of ceiling on either side. After reconfiguring the electrical wiring, crews
replaced the section of ceiling to match its original condition.

The corridor renovation also included the removal of old light fixtures, electrical outlets, cabling, conduits, window treatments, carpeting and lead-based paint.

**HISTORIC CHARACTER**

A major factor when renovating a century-old building is balancing modern-day upgrades with the preservation of the design's original charm. The design team researched works from Hotel Del Monte’s original architects, Lewis Hobart and Clarence Tantau, and used them as inspiration when creating custom design elements and selecting high-end finishes. The goal was to stay true to the Spanish Colonial Revival design and provide continuity from their original intent.

In addition to recessed lighting for general illumination, custom fixtures were installed as part of the $18 million renovation. These ornate fixtures featured modern LED lighting and were specially designed by a San Diego manufacturer to match existing antique fixtures in the main stairway. Even the replacement carpet was custom-created to replicate a pre-existing one-of-a-kind design.

When guests enter the bathroom, they also will notice new tile flooring reminiscent of the original period design. Each tile in the bathroom is handmade and a slightly different size, hearkening back to 16th Century Spanish design.

**A SUCCESSFUL RENOVATION**

The hotel at Herrmann Hall plays a critical role in providing a home away from home for active duty or retired servicemembers visiting the installation. The Naval Postgraduate School educates servicemembers, across all branches of the Armed Forces, in highly technical areas, offering master’s and doctoral degrees in more than 70 fields of study.

Since the hotel of Herrmann Hall reopened, guests have remarked at the elegant design and unique craftsmanship of the guest rooms and corridor—modern work with a historic look.

Joe Mark, M.SAME, is Operations Manager, Commercial and Military Projects, Stellar; jmark@stellar.net.
For the past year, a group of 51 representatives from throughout the private sector has had an unprecedented opportunity to gain first-hand experience learning about the unique responsibilities of the U.S. Coast Guard across all its business lines—and how industry can better support the service’s dynamic requirements.

By Michael Huffstetler, Assoc. AIA, LEED AP, M.SAME

As SAME moves towards its Centennial in 2020, one of the key strategic lines of effort that has emerged is “enhancing industry-government engagement.” In fact, expanding the impact of industry-government engagements beyond marketing by impacting project delivery is something that federal agencies and the A/E/C industry must strive for. With the help of the Washington Homeland Security Roundtable, the U.S. Coast Guard is already leaning well forward in this area.

But the Coast Guard did not stop with just the A/E/C industry. It is cultivating enhanced engagement across all of its business lines and service providers.

In late 2017, I was honored to be selected for the inaugural class of the Coast Guard Industry Academy. As part of the year-long course, which runs until February 2019, 51 representatives from a broad range of industries will have visited six geographic regions and received an unprecedented, in-depth look at the Coast Guard’s people and its multi-dimensional mission sets. The Coast Guard Industry Academy is providing direct access and visibility into the specific operations and responsibilities of our nation’s most unique national security asset.

UNIQUE NATIONAL ASSET

Ask the general public about what the Coast Guard does, and it is common to get a vague answer about rescuing people in the ocean. In fact, the Coast Guard is the international standard of maritime defense, but many have little understanding of the true scope and value of its work.
Across 11 assigned missions (both statutory and regulatory), the Coast Guard’s role can be summarized in four distinct themes:

- To serve as America’s “maritime 911”
- To facilitate commerce
- To act as a defense force at all times
- To bring a border security force—with an “away game” global presence

The Coast Guard commands a surface fleet larger than most countries’ entire navies. Under the Department of Homeland Security (DHS), it is the most asset-heavy component, operating 240 cutters, over 200 aircraft, 1,600 small boats, and more than 29,500 buildings and structures (the “shore plant”).

**BEYOND THE SHORELINE**
The Coast Guard’s national security border extends well beyond the U.S. shoreline, for example, reaching 1,000-mi south into the Caribbean as a counter to illegal trafficking. It also has deployable special forces units that provide enhanced port security worldwide wherever the U.S. Navy needs to operate.

The Coast Guard has an ongoing international presence in capacity-building across the globe. The governing tenants of its international security operations are simple and effective: the Coast Guard is discrete, recurring, and comprehensive. Translation? It assists other maritime security forces without fanfare or drama. Because of its small size, border-focus, and judicious use of assigned resources, the Coast Guard is also highly relatable to many other countries. These relationships are very important to America’s national priorities and global security.

**ADDRESSING REQUIREMENTS**
Despite a multi-hatted role, the Coast Guard is historically underfunded. In recent years, with Congressional backing, the service has been able to secure funding to update much of its surface fleet, and yet on the “shore” side—fixed facilities and infrastructure—maintenance continues to lag and trend downward. The average building age is 43 years.

As then-Commandant of the Coast Guard, Adm. Paul Zukunft, USCG, stated at the first session of the Coast Guard Industry Academy, and again in Senate testimony days later, the Coast Guard has a $1.6 billion backlog of repairs and upgrades to shore infrastructure that has continued to increase under stagnant annual appropriations. It hopes to convince Congress to establish a “floor” baseline of $2 billion annually in capital investment every fiscal year to begin addressing aging shore infrastructure, and to head off the yearly backlog increases on deferred maintenance and improvements.

The Coast Guard extends service life whenever possible rather than mothballing or replacing. Building in resiliency and longevity are especially prized given the added value placed on stewardship in every business line.
When working with the Coast Guard, the A/E/C community can help mold perceptions beyond just the contractual or transactional modes. To truly help serve the mission, we must strive to be advocates, ambassadors, and solution-providers who are sensitized to the service’s unique funding challenges and can find creative ways to help.

Deeply understand its missions and challenges. Get to know what the Coast Guard does—all of it, not just for your specific business line. Avoid thinking of it as a military entity with deep pockets. The Coast Guard requires the A/E/C community to deliver innovative and fiscally responsible solutions.

Be at the table, not across. We need to fully understand the Coast Guard’s constrained budgets, and be aware of the difficulty it faces in asking for change order funding during planning, design and construction. To do this, we must pay extra attention to the requirements-verification and needs-definition phases of our projects. When we do, we become partners and problem-solvers at the table—colleagues, rather than contractors across the table.

Lose the “nothing to lose” protest philosophy. There is a growing trend in some markets and procurements to taking a “nothing to lose” attitude toward filing protests. This cannot be our default mode. Valid, verifiable and legitimate grievances that result in filed protests are one thing; disrupting procurement cycles merely because we disagree hurts the agency we are there to support.

ADVOCACY AND SUPPORT

Just as there are multiple ways SAME members can actively engage with the Society (volunteerism, networking, professional growth), there are multiple dimensions of the Coast Guard that are in need of advocacy and support from across the A/E/C community.

Whether interested in enhancing shore infrastructure through working on funded projects, or financially supporting the Coastie legacy through initiatives such as a permanent National Coast Guard Museum, anyone has the potential to add their voice to advocating for the service by understanding not just what the Coast Guard does, but why it does it.

The Coast Guard is the nation’s oldest continuous armed force on the sea, beginning in 1790 as the U.S. Revenue Cutter Service (the Continental Navy was disbanded immediately following the Revolutionary War). A powerful symbol of this legacy, “America’s Tall Ship,” the Barque Eagle is still in service today. The 295-ft flagship is the only active-duty sailing vessel in America’s military and one of only two
commissioned sailing vessels, along with the USS Constitution operated by the Navy. Since 1946, the Eagle has been used as a full-time training platform for the Coast Guard Academy and Officer Candidate School cadets. Every cadet at the academy spends a minimum of six weeks at sea learning nautical traditions, basic seamanship, and navigation skills as well as team-building and leadership. People often ask why they cannot learn these skills on modern ships, but the conditions and activities they face under sail simply cannot be replicated in a classroom or on-board today’s Coast Guard vessels.

In addition to its annual training mission, the Eagle also serves around the world as “floating goodwill ambassador” for the United States at overseas ports, and stateside as an important public relations role at domestic port calls.

Earlier this year, our Coast Guard Industry Academy class performed a three-day honorary stint as part of the permanent crew assigned to the Eagle, sailing from Yorktown, Va., to about 40-mi out into the Atlantic Ocean under sail.

After three days at sea, some key takeaways emerged.

- No matter the age or condition, the Coast Guard takes care of its gear.
- Durability is paramount and the Coast Guard will maintain what it has in order to get the job done. Preventive maintenance is engrained within every career field.
- Facility-related design and construction solutions must look for ways to reinforce this enhanced demand for durability and preventive maintenance operations.
- Design should always try to reflect the Coast Guard’s legacy of selfless seamanship in creative yet economical ways.

SPECIAL FORCES UNITS

After disembarking the Eagle, Industry Academy participants were provided briefings and tours of Training Center Yorktown, Va.; Base Support Unit Portsmouth, Va.; Sector Hampton Roads, Va.; and Air Station Elizabeth City, N.C. While many of us were aware of the various training centers and some of the types of training performed there, no one was prepared to come face-to-face with the Coast Guard’s equivalent of the Navy SEALs, U.S. Army Rangers, or U.S. Air Force Special Operations Forces.

The Maritime Security Response Team (MSRT) is a tactical unit that specializes in maritime counter-terrorism and high-risk law enforcement. Coast Guard responders train rigorously to board and secure vessels, especially those that are held by terrorists holding hostages.

Our group was provided demonstrations and hands-on orientations for hook-and-climb vertical ship access, ship boarding by helicopter, tactical entry while onboard a vessel, K-9 search teams, sniper operations, and hands-on weapons training. The exposure to this heightened security training mission was especially eye-opening since this is a side of the Coast Guard that is seldom seen or publicized. In fact, no photos were allowed during the visit.

Observations revealed that MSRT training enables the United States to operate an effective maritime border and counterterrorism force at sea—well beyond our physical shoreline.

Like many of its shore facilities, the Coast Guard makes do with what it has, and austere training environments are not necessarily a bad thing for this type of tactical training. However, some special operations teams require specialized facilities, like those at Under Water Egress School at Air Station Elizabeth City. The A/E/C industry should look for ways to reinforce this enhanced demand for durability and the Coast Guard’s special operations roles, and design accordingly.

SEARCH AND RESCUE TRAINING

At Training Center Yorktown, the largest of the Coast Guard Training Centers, our group was introduced to the 38-ft Response Boat Medium, which is used for training purposes. These are high-speed response training boats, though smaller than the 45-ft boats used operationally.

We also toured a Rescue Swimmer Training Facility and Under Water Egress Trainer in Elizabeth City where the cadre demonstrated their dunk tank (a massive pool that simulates a nighttime storm on the open sea, complete with a wave machine). A trainer lowers trainees within a simulated airframe into the water, then inverts them so the trainees are upside down while submerged in total darkness under high seas and high wind—all to create the most accurate real-life training environment.

During the unprecedented 2017 hurricane season, personnel from Air Station Elizabeth City flew 20 percent of all Coast Guard hurricane support, and performed hundreds of life-saving missions. During our visit, we watched a C-130J flight demonstration of rescue response flight operations. Flying about 150-ft above the surface of the water, the crew released survival gear in multiple drops to simulated distressed boaters.

These demonstrations all underscored that it is no accident the Coast Guard is world-renowned for search and rescue. As one saying goes, “Coasties are good at what they do—saving your butt!” Search and Rescue Training is extremely selective. Collegiate and Olympic swimmers are often promoted as ideal candidates, but they often “wash out” of the school. More than swimming skills and technique, strength and endurance, especially under duress, are the difference-makers during training. In fact, surfers, who are used to unforgiving seas and undercurrents, and even wrestlers perform better than highly trained swimming athletes.

Search and rescue goes to the core of Coast Guard existence: it is one of its oldest missions dating back to the original U.S. Life Saving Service in 1848. But in training personnel for search and rescue operations, quality trumps quantity. It is important for us, as designers, engineers, and constructors, to remember this uncompromising view of safety.

FINANCIAL STEWARDSHIP

Perhaps driven by long-standing lean budget appropriations, or perhaps by the fact that the Coast Guard is “always on” with both law enforcement and military missions, it is incredibly self-sufficient and an excellent steward of taxpayer dollars.

One of the best examples of responsible stewardship occurred at the Coast Guard Aviation Logistics Center at Air Station Elizabeth City. This is the hangar where personnel tear-down HH-60 and HH-65
The 295-ft Barque Eagle is the only active-duty sailing vessel in America’s military. PHOTO COURTESY MICHAEL HUFFSTETLER
Construction (MILCON) budgets, which the Coast Guard refers to this branch of the armed forces.

about what they do, but they are getting better. It falls on service traditionally have not done a good job of getting the word out there. Coast Guard officials will be the first to admit they and services. In leadership training, this is referred to as studying fees and contracts, and to truly understand our agency partners to increase the resiliency of shore infrastructure are out there, but Coast Guard facilities. Opportunities for judicious enhancements are especially prized given the added value placed on stewardship than mothballing or replacing. Building in resiliency and longevity in service, 11 more in production, and an extensive network of our Russian counterparts, who reportedly have 40 icebreakers of its only operational icebreaker, the Polar Star. Contrast this to Coast Guard to receive a new polar ice breaker to meet a quickly funding has been granted by Congress in FY2018-FY2019 for the service life of maritime vessels. Additionally, while long-awaited at “The Yard” is a critical internal capability for extending the service life of maritime vessels. Additionally, while long-awaited funding has been granted by Congress in FY2018-FY2019 for the Coast Guard to receive a new polar ice breaker to meet a quickly expanding Arctic mission, to date it has been extending the life of its only operational icebreaker, the Polar Star. Contrast this to our Russian counterparts, who reportedly have 40 icebreakers in service, 11 more in production, and an extensive network of Arctic military bases and ports.

The Coast Guard extends service life whenever possible rather than mothballing or replacing. Building in resiliency and longevity are especially prized given the added value placed on stewardship in every business line. “Doing more with less” is engrained.

The Coast Guard values economy of means paired with selfless service. The A/E/C industry should look for similar opportunities when designing and constructing repair/renewal or replacement Coast Guard facilities. Opportunities for judicious enhancements to increase the resiliency of shore infrastructure are out there, but we must tune in and actively look for them.

It is important for us to look beyond spending projections, fees and contracts, and to truly understand our agency partners and services. In leadership training, this is referred to as studying “their there.” Coast Guard officials will be the first to admit they traditionally have not done a good job of getting the word out about what they do, but they are getting better. It falls on service providers to invest a bit more time and energy to better understand this branch of the armed forces.

EXTENDING SERVICE LIFE

Last November, our group toured the Coast Guard Yard in Maryland, just south of Baltimore. Maintenance performed at “The Yard” is a critical internal capability for extending the service life of maritime vessels. Additionally, while long-awaited funding has been granted by Congress in FY2018-FY2019 for the Coast Guard to receive a new polar ice breaker to meet a quickly expanding Arctic mission, to date it has been extending the life of its only operational icebreaker, the Polar Star. Contrast this to our Russian counterparts, who reportedly have 40 icebreakers in service, 11 more in production, and an extensive network of Arctic military bases and ports.

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UTILIZING CONTRACTING VEHICLES

Driven in part by comparatively small repair/renewal and Military Construction (MILCON) budgets, which the Coast Guard refers to as AFC43 and AC&I accounts, the Shore Infrastructure Logistics Center located in Norfolk, Va., has a finite number of recurring A-E and Design-Build IDIQ contract vehicles it utilizes. The Coast Guard differs from its sister services in that these relatively small number of IDIQ contracts are typically set up for longer durations. Option years extend out to seven or even 10 years.

A general A-E services IDIQ, a 10-year nationwide DHS contract, taps into the resources of both large and small business A-E firms and is available to other DHS components to use. Other contract vehicles include a recurring National Environmental A-E Services IDIQ, a Coastal Engineering A-E IDIQ, and multiple regional A-E IDIQs that are set-aside to small business. For example, District 1 (New England), District 17 (Alaska) and District 14 (Hawaii) all have dedicated IDIQs.

On the design-build side, Maximum Allowable Cost (MAC) contracts are used to execute both MILCON and higher dollar value repair/renewal work. These include a seven-year national large-business MAC (also available to other DHS components) and multiple regional MACs that are each set-aside with contractor pools assigned to specific small business categories. Request-for-proposal/bridging package development is either done in-house or through A-E contracts. The Coast Guard also has a Tower MAC contract for use with its aids-to-navigation system. Most of the service’s small business goals on the shore infrastructure side are achieved through regional small business set-asides.

These programs are completely dependent on strong public-private partnership. The Coast Guard “physical plant” includes more than 90,000 acres, almost 2,000 sites and installations, and over 25,900 structures, comprising industrial facilities, sectors and stations, housing and barracks, training centers, air stations, and waterways structures.

ESSENTIAL MISSIONS

As both a federal law enforcement agency and a military force, the Coast Guard protects our nation’s shores and waterways during peacetime. In wartime, or at the direction of the president, the Coast Guard can perform as a service under the Department of the Navy. Its six mission programs—Maritime Law Enforcement; Maritime Response; Maritime Prevention; Maritime Transportation System Management; Maritime Security Operations; and Defense Operations—are all touched in some way by the shore facilities and infrastructure.

Because of a relatively narrow band of shore facility contract vehicles, industry-government engagement takes on special meaning. There is an inherent increased reliance on industry partners for innovation, efficiency, and resilience-thinking in both design and problem-solving.

What the A/E/C community does to improve and sustain shore facilities impacts every one of the service’s six essential missions. Every Coast Guard mission begins and ends at a shore facility.
OUR FOUNDATION is rooted in our heritage.

Established in 2016, the SAME Foundation serves to give back by paying it forward. Offering an unprecedented opportunity to support the development of the next generation of military, government civilian, and A/E/C industry leaders, the SAME Foundation is focused on investing in programs and opportunities that drive professional and personal growth and help foster engineering leadership for the nation.

America’s future is bright. Let’s help make it brighter.

www.same.org/foundation
TO THE LIBERATORS OF AINCREVILLE

In the fall of 1918, the soldiers of the 6th Engineer Regiment would be called to fight as infantry and in the battle at Clairs Chenes Woods helped to break the German line as part of the Meuse-Argonne Campaign, which then continued east toward Germany until the armistice on “the eleventh hour of the eleventh day of the eleventh month.”

By Lt. Gen. Theodore Stroup, P.E., F.SAME, USA (Ret.)

Clairs Chenes Woods, or the White Oaks, Hill 294, a small stand of Oaks, surrounded by agricultural fields in 1918, and still farmed today 2018, lies in the canton of Dun-sur-Meuse in the Meuse River Valley and was the site of ferocious fighting that involved the 3rd Division’s 6th Engineers, who were committed as infantry in October 1918.

The terrain, rolling farmland interspersed with small patches of woods, Bois in French, was contested over a seven-day period of the Meuse-Argonne Campaign and eventually won from the German Army by the 3rd Division and its troops in late October.

The area was heavily fortified with bands of wire, trenches laid out to channel attackers, and multiple machine gun nests sited to provide heavy reinforcing crossfires as well as an established artillery plan for gas and explosive shells. As part of the overall battle plans, several infantry regiments from the 3rd Division were committed to take and clear the surrounding area with support from the 6th Engineers in both a sapper and combat engineer role. Initially the 6th was in support of the 7th Provisional Infantry Regiment as the engineer support. Equipped with picks, spades, breaching ladders and rolls of wire and wire stakes, the soldiers were engaged as engineers with two combat companies. The weather was continuous rain with early chilling temperatures.

The area of battle in the Meuse Valley was continually reinforced by the Germans over a considerable period in anticipation of the Allies’ final campaign in the fall of 1918.

The enemy was ready, prepared and waiting. The campaign commenced Oct. 8, and had advanced with heavy casualties. The 3rd Division advanced into the canton of Dun-sur-Meuse with regiments abreast. The 7th Provisional Infantry Regiment was spent in the early fighting in this area, when the 6th Engineers were committed as infantry to continue the momentum of the attack. The rapid counterattacks by the Germans caused this area of the battle to ebb and flow across the heavily fortified German trench lines and multiple bands of wire. Ultimately, the 6th Engineer Regiment would be instrumental in capturing the Clairs Chenes Woods, but at a heavy price.

ARRIVING IN FRANCE

The 6th Engineers arrived in France months before and early on was exposed to combat engineering in other locations. This experience later proved valuable to the Allied efforts.

The 6th Engineer Regiment was formed as a unit in the summer of 1917 as part of the newly establishing 3rd Infantry Division at two locations in the Washington, D.C., area: Camp American University and Camp Humphreys (now Fort Belvoir). Initial staffing and manning was taken from a part of the existing 1st Infantry Division before it shipped out. The new regiment’s structure was two battalions, a headquarters company for the regiment and one
for each of the two battalions and six line companies: A through F, the 6th Engineer trains, and a medical detachment. Organizing overrode training at both the battalion and company level due to the urgency of getting another U.S. division shipped to France. At the time of shipping, the records reflect a regiment of 50 officers and 1,583 men.

Somewhat organized with new troops and new leaders, there was little equipment on hand during this time. The engineers entrained from Washington, D.C., to Bayonne, N.J., shipping on Dec. 4, 1917 as one of the earliest 3rd Division units to France. They shipped on two transports: SS George Washington and SS Huron. These transports arrived in France: Brest for the George Washington on Dec. 23 and St. Nazaire for the Huron. The regimental trains shipped later on the SS Eagle due to transport problems to the port and were delayed further—until Jan. 19, 2018—due to mechanical and engine problems on the ship.

Upon arrival in France, the 6th Engineers along with some divisional artillery were sent immediately north to vicinity of Amiens, to assist the British Fourth Army of its British Expeditionary Force in its initial push back against the Germans offensive under Ludendorff. This journey was to take some 56 hours on the train, the tiny box cars of which were labeled “8 Chevaux 40 hommes” (the famous “40 and 8”). The weather was an unusually bitter cold and rainy. Rations were cold hard bread, canned corn beef, and lukewarm coffee provided at several train stops. Upon arrival at the small town of Prathoy on Christmas Eve, work came in projects of roads, temporary barracks and trench work with wire entanglements on the front. It was the engineers first exposure to snipers, barrages of high explosives and gas shells, and air plane attacks.

That ensuing fight in the British sector was early and tough combat for them: both as combat engineers and as committed infantry. They were “bloodied and combat tested” before the rest of the 3rd Division that was still arriving in France from its later shipment from Bayonne.

In June 1918, the regiment was released from the British Expeditionary Force and sent back south to join the 3rd Division in the newly forming American Expeditionary Forces. At that time, the 6th Engineers and the rest of the division was still equipping and training under French assistance.

Return to the American sector and ranks brought more combat for the already battle tested regiment: Chateau-Thierry, Belleau Woods, the Champaign-Marne Defense, the Aisne-Marne Offensive, St. Mihiel Offensive, and the Meuse-Argonne Offensive.

A COLD AND WET AUTUMN

For the fully fielded American Expeditionary Forces, the “big show” of Gen. John Pershing, USA, was a campaign plan against the Germans in the new American Sector. The area assigned by that Supreme Commander, Marshall Ferdinand Foch, was the portion of the front between the Argonne Forest and the Meuse Valley. A successful campaign here had the goal of severing the German internal rail lines, which had been providing strategic movement capability for troops, munitions and supplies. The overall campaign kicked off on Sept. 26, 1918. The weather had turned unexpectedly wet for the autumn and the temperatures dropped precipitously to give the Americans freezing and wet conditions in which to attack. The Germans were aware of this and reinforced in both units and massive belts of barriers and firepower.
The 6th Engineers had its missions daily focused on supporting the infantry, committed with engineer works in front of and along the lines.

By mid-October, progress was being made along the front and the Germans were falling back all along the front lines. At this time, the 6th Engineers were engaged in combat engineering tasks: rapid road rehabilitation and construction; clearing of obstacles and the massive wire entanglements; forward and rapid bridging. The soldiers had not been committed again as infantry since their participation with the British Expeditionary Force in the north. The overall intent of the battle plans at corps and division level was to push the Germans back to their national boundaries and sever the rail lines leading to and from Sedan. A critical piece of the terrain was a large hill mass, Montfaucon, that provided strategic observation and fire direction capability for the Germans. After Montfaucon was secured, the battle momentum continued eastward to the Siegfried Line. The 6th continued as part of this push east entering another critical area of the Meuse Valley.

At this point of the battle, on Oct. 20, the 6th, in support of the Provisional 7th Infantry, was in flanking positions for the 7th, securing its side boundaries. As the 7th faltered, the 6th was given the mission to fight as infantry and secure the White Oaks. This was to be their fiercest battle of war.

The rain and darkness made it all the more difficult. The hill, 294, was laced with wire entanglements and multiple reinforcing machine gun nests. The Germans had ample time to prepare defenses in depth with interlocking machine gun fires and multiple artillery target points plotted. A pair of companies, B and D, led the attack, and with heavy losses, secured the Clairs Chenes and held it during several heavy counter attacks.

WHEN THE FIGHTING CEASED

At the end of the fourth day, the Germans gave way and the area, to include the Clairs Chenes, was in American hands. Overall the Meuse-Argonne Campaign broke the German line and continued to move east toward Germany until the armistice on Nov. 11, when the fighting ceased.

After that, the 6th Engineers marched into Germany for occupation duty near Octendung until August 1919 when it returned to the United States to face immediate demobilization.

In total, at the end of the battle in the Meuse, the battalion's losses were the heaviest of its participation in the war. Casualties were 28 killed in action; 102 wounded; 18 gassed; and 29 missing. Out of that single battle, there were three Distinguished Service Crosses awarded, with one being presented posthumously to the Commander of B Company, Capt. Charles Harris, USA, for his extraordinary heroism in action in the Clairs Chenes on Oct. 20, 1918.

As extracted from General Orders, War Department, No. 70, 1919: “While leading his company in an attack on enemy machine-gun nests he, with three of his men in advance of the remainder of the company, fearlessly attacked an enemy machine-gun nest, capturing three prisoners and two guns, turning the guns against the enemy. He was mortally wounded while operating one of the guns in an exposed position.”

A monument in the small village of Aincrerville still bears homage to the Americans who fought and died there 100 years ago. A Nos Allies Americains Et Au Brave Capitaine Harris, Libérateurs d’Aincrerville, it reads: To our allies the Americans and to the brave Captain Harris, Liberators of Aincrerville.

The 6th Engineers marched into Germany for occupation duty near Octendung until August 1919 when it returned to the United States to face immediate demobilization.

At Camp Merritt. The balance of the regiment then moved for duty at Camp Pike in Arkansas until final demobilizing.

In the years that followed, the 6th Engineers remembered the battle at Clairs Chenes. And in 1921 a new coat of arms and motto was approved: Clairs Chenes N’oubliez Jamais (The Cleared Chenes—Never Forget Them).

Today, the 6th Engineers serve proudly in Alaska as part of U.S. Army Alaska, with other battles and campaigns on its colors including World War II, Korea, Iraq and now Afghanistan.

Editor’s Note: The Armistice of 11 November 1918 was signed 100 years ago, bringing a cease to fighting of The Great War. During the war, more than 10,886 officers and 292,300 men served as military engineers—the great majority of whom were called to serve from across the United States, leaving behind civilian positions where they lived and going “over there” as part of the American Expeditionary Forces. For perspective, before America entered the war, engineer officers and men numbered 256 and 2,228 respectively. In 1919, then U.S. Army Chief of Engineers Maj. Gen. William Black, USA, as he was overseeing the drawdown of engineer troops, appointed a panel of officers to consider the formation of an “association of engineers” that would preserve and expand upon the connections formed and lessons learned during the war and ensure the engineering community would never again be unprepared for battle. In January 1920, the Society of American Military Engineers was formed, with Maj. Gen Black as its first President. Those who served in what would become known as World War I founded the Society on the principles of patriotism and national security, and promoting solidarity and co-operation between engineers in civil and military life. To honor those who served in The Great War, those who heroically gave their life, and to build awareness of SAME’s origins and of its future as the Society approaches its Centennial in 2020, TME will publish a WWI-Era Commemorative Issue this winter.
DISCOVER SAME

CENTENNIAL TASK FORCE
This fall, Capt. Bob Bevins, P.E., FSAME, USCG, an Elected Director on the Board of Direction, was named Chair of the Centennial Task Force.

Capt. Bevins, working with the Board of Direction and the SAME National Office, will be supporting organization of, and leading member involvement in, the three-year Centennial Celebration, which comprises the Run to 2020, the 2020 JETC Centennial Kick-Off (May 27–29, 2020 in Washington, D.C.), and the Post/Regional Celebrations that will be held from May 2020 through May 2021—all culminating with the 2021 JETC in Portland, Ore.

Critical to the success of SAME’s Centennial is leveraging the anniversary as a launch point into our second century. Building greater member engagement and participation—especially at the Post level—will ensure the Society is enabled to make a significant impact to the nation, and to the profession.

All Posts should be establishing a new Post Board Position, a Post Centennial Coordinator, that will work with the Centennial Task Force and the National Office to ensure every Post is informed about Centennial activities and opportunities over the next three years.

NATIONAL LEADERSHIP NOMINATIONS
The SAME National Leadership Team is committed to finding dedicated volunteer leaders who are steeped in a broad range of SAME experiences and who have a strong foundation of proven Post-level achievement.

As the Society approaches its Centennial in 2020 and grows its role as the lead collaborator within the A/E/C profession, it is important to find engaged and committed members to serve as National Officers and Elected Directors on the Board of Direction, the governing body of the organization.

Leadership Nominations for 2018 are open from Oct. 1–Dec. 1. All nominations must be made at www.same.org/leadershipnominations. Respective nominating committees then will determine the candidates who will be voted on by the entire membership during online elections, to be held from March 1–April 15, 2019.

2018 PUBLISHER’S STATEMENT
Published as required by the U.S. Postal Service.
MEMBERSHIP MATTERS

While 2018 seems like it has flown by, we have accomplished quite a bit in what has been a busy year for SAME! Increasing participation has been one of our biggest focuses, and one indication of how strong engagement has become is that for the first time, all active Posts provided an annual report detailing what each is doing in contributing to the 2020 SAME Strategic Plan and most importantly, how they are supporting members. If you have had a chance to read the 2017 SAME Annual Report or watch the video, then you can see how important it is for Posts to submit timely, detailed reports, so that we can truly tell our story as One Society.

Another focus has been on creating awareness on one of the principle reasons the Society was created: to bring industry and government together to solve infrastructure-related challenges and support national security. And with that, we have seen many Posts focusing on industry-government engagement activities, such as industry days, resiliency events, small business forums, and technical problem-solving workshops.

As we look to the start of our next century (now just over a year away), the Board of Direction has outlined five key pillars that SAME members are most passionate about and where having an impact will have a direct positive benefit on our country’s future: Enhancing Industry-Government Engagement; Developing Leaders for the Profession; Producing STEM Professionals for the Nation; Preparing Veterans for the A/E/C Industry; and Strengthening Resilience throughout the Country. Posts, as you plan your activities for 2019, think how the programs and opportunities you offer members will enrich SAME’s collective contributions in these important lines of effort.

I hope everyone has a wonderful and safe holiday season. Looking forward to another great year in 2019! You can always reach me at jmurphy@same.org.

SALUTING SUSTAINING MEMBERS

The following companies will celebrate Sustaining Member milestones during November-December 2018.

- **60 YEARS**
  - LEO A DALY

- **30 YEARS**
  - Cooke Douglass Farr Lemons Architects & Engineers PA

- **25 YEARS**
  - Right Angle Engineering PC

- **20 YEARS**
  - Belstar Inc.
  - ALPHA MRC Architects Engineers
  - CEMS Engineering|Architecture
  - Macro-Z Technology

- **15 YEARS**
  - MECX Inc.
  - Notkin Mechanical Engineers
  - BDS Engineering Inc.
  - AmOrient Engineering
  - S&ME Inc.

STREAMER SUBMISSIONS DUE JANUARY 31

Each year, Streamer Awards are presented to Posts in recognition of outstanding performance and achievement in support of the SAME mission and strategic goals and objectives. Posts interested in applying for Streamers can visit www.same.org/streamerawards to view criteria and download submission documents.

The deadline for Streamer submissions is Jan. 31, 2019.

AWARDS NOMINATIONS DUE FEBRUARY 1

SAME’s annual Awards & Medals Program recognizes Sustaining Member companies as well as individual members from the public, private and academic sectors for excellence in engineering, architecture, education, leadership, STEM outreach and industry-government collaboration. To view awards criteria and to submit a nomination, visit www.same.org/awards.

The deadline for awards nominations is Feb. 1, 2019.
The Great Basin Post recently supported the STEM Information Booth at the annual Salt Lake City FanX Convention. Post members partnered with the Utah Engineers Council and the STEM Program Office from Hill AFB, Utah, for an opportunity to talk about STEM careers and promote SAME’s Engineering & Construction Camps, STEM outreach, and scholarships. Over 100,000 science fiction fans attended this year.

In September, the Seattle Post and Mount Tacoma Post jointly held their annual Veteran Transition Panel at Joint Base Lewis-McChord, Wash. For the first time, the event branched beyond the 555th Engineer Brigade and included U.S. Air Force members and one U.S. Navy officer. The outreach supported three of the four goals within the 2020 SAME Strategic Plan: Relationships, Leadership and Mentoring, and Professional Development and Personal Growth. Led by Col. Tony Hofmann, ESAME, USA (Ret.), of the Greater Kansas City Post, SAME’s Warrior Transition Program brings together recently transitioned veterans to inform servicemembers who are nearing separation or retirement on how they can successfully transition into post-military careers.

The Fort Hood Post has been very active lately, including hosting a joint meeting in July with the City of Killeen, Texas, on Engineering Ethics and welcoming Brig. Gen. Paul Owen, USA, USACE Southwestern Division Commander, as the featured speaker at its June meeting. Then in October, the Post hosted a well-attended golf tournament with more than 30 participants that raised funds to support its outreach and programs.
This summer, the Minneapolis-St. Paul Post hosted its 33rd Annual Golf Tournament along with its Industry Day, in which participants earned 3 PDHs. Proceeds from the tournament are put into the Post’s Education & Mentoring Fund, which is used to award scholarships to students. (Left to right: Erin Krug, Post Junior Vice President; 2018-2019 scholarship recipients Matias Erickson, Vincent Ledvina, and Shane Hendrickson; Paul Dierkin, Post President.)

The Black Hills Field Chapter, which is under the Omaha Post, partnered with the Rapid City Area Chamber of Commerce Military Affairs Committee this fall to host the first Black Hills Defense & Industry Symposium. The event welcomed over 175 attendees, facilitating collaboration and education for regional businesses working on design and research within the defense industry. The Honorable John Henderson, FSAME, Assistant Secretary of the Air Force (Installations, Energy & Environment) served as the keynote speaker.

In August, the San Antonio Post held its Small Business Market Research Fair. The event drew about 400 attendees, including the entire leadership team from the Air Force Civil Engineer Center and representatives from several USACE districts: Mobile, Omaha, Fort Worth, Sacramento, Little Rock, and Tulsa. Many industry-government engagement topics were covered, including execution of Military Construction projects and Optimized Remediation Contracts. Ahead of the two-day event, the Post held a golf tournament to support its education and mentoring efforts, raising more than $40,000.
LEADING COLLABORATION IN ST. LOUIS

The St. Louis Post was chartered in 1920 and for many of the last 98 years has had the unique opportunity to be a member of the Engineering Center of St. Louis, which gives it the ability to connect first-hand with other professional societies and exercise SAME’s mission of leading collaboration.

TME chatted with Post Treasurer Bob Welsch, P.E., on how the Engineering Center was formed, how it supports collaboration, and what the Post has done to help sustain its success.

TME: Can you describe the Engineering Center of St. Louis and how the Post became a part of it?

Welsch: Originally formed as the Engineers’ Club of St. Louis, the Engineering Center of St. Louis is believed to be the third oldest engineering organization in the country. It was chartered in 1868 by Col. Henry Flad, USA, who was Chief Assistant to James Eads in the design and construction of the Eads Bridge in St. Louis, the first steel bridge in the world and one of the earliest long bridges over the Mississippi River. Col. Flad served as President of the Engineers’ Club for 12 years until 1880.

In 2018, the Engineering Center is celebrating its 150-year Anniversary. Our Post is celebrating its 100th Anniversary in June 2020. It is thought that for many of those years, the Post has held its meetings at the club. As long as anyone can remember, we have been holding our Post meetings at the current facility, which was built in 1954.

TME: How does the Center bring other organizations together and what are the benefits of doing so?

Welsch: Owning the property and building in which the Engineering Center is housed has provided the opportunity to support other organizations in the St. Louis area. The Center oversees a collection of Affiliated Societies, of which the St. Louis Post is one of 33. These societies are able to use the Center and its facilities for meetings, luncheons, fundraisers, and educational programs. It is not unusual for many organizations to have joint luncheons or events. Everyone in St. Louis knows about the Center, and the estimated 14,000 engineers in the region undoubtedly have attended an event there at some point in their career.

TME: Does the Center play a role in the Center’s operations?

Welsch: No direct role, however, when the Engineering Center began a capital campaign to renovate the facility, beginning in 2012, our Post contributed $15,000, as did many of the other affiliates. By 2015, enough money had been raised to renovate the old auditorium, and by 2017, construction was completed on the new meeting space.

Coincidentally in 2016, the St. Louis Post was developing a 15-year budget, and looking for worthy opportunities to use the money that had been so generously donated by the local architecture-engineering community. We had been lucky enough to co-host the SAME National Conference [2012 JETC] and a number of smaller Midwest Levee Conferences. We felt that the local architecture-engineering community had supported those events, and we should support it in return by improving the facility that so many regional engineers benefit from. We developed a budget that still allowed us to do all the veteran, student, and member activities we had done in the past, but enabled us to donate an additional $100,000. We decided to do so by challenging the other Affiliated Societies, and we used our $100,000 as matching contributions. Within a year, our $100,000 had resulted in a donation of $200,000, allowing them to begin design and construction of the remainder of the facility upgrades.

TME: How does the Center’s interaction with other organizations help SAME achieve its mission?

Welsch: The location and history of the Engineering Center is critical to leading collaboration among engineering societies. Because of the familiarity with the Center and its Affiliated Societies, the St. Louis Post is able to frequently have joint meetings including with ASCE, APWA, and the SAME Scott Field Post. Additionally, because the Center exists to further the engineering profession, providing cost-effective opportunities to hold meetings, luncheons, career fairs, and STEM events, that allows more of the Affiliated Societies resources to be used on impactful activities, rather than paying rental fees.

For more information, visit www.engineeringcenter.org.

"As long as anyone can remember, we have been holding our Post meetings at the current facility, which was built in 1954."
NEW NATIONAL LEADER DEVELOPMENT PROGRAM
SAME has established a new national Leader Development Program that will work to identify and cultivate leadership from within our membership.

Through this program, which is supported by the SAME Foundation, the Society will help fill a vital training gap within our industry, deliver value to members and Posts, and ensure strong leadership for the future of the nation.

Applications for the first class are open until Dec. 21, 2018, and the first class will begin at the 2019 JETC in Tampa, Fla. (May 7-9). The target participant is an enthusiastic, mid-career professional who is dedicated to SAME and who exhibits the talents and capabilities necessary to become a leader.

The inaugural class will consist of 17 candidates, one from each SAME region. The plan is to grow participation in subsequent years.

Program Overview
The Leader Development Program is a year-long commitment that begins at the 2019 JETC. The inaugural class’ graduation will be held at the 2020 JETC in Washington, D.C.

The program approach is broken into three themes:
• Know Yourself  • Know Your Team  • Know Your Future

Program Objectives
The Leader Development Program, which has a duration of one year, has several overarching objectives.
• Support the development of the next generation of military, government, civilian, and industry leaders.
• Understand individual strengths and how to apply these strengths to achieve success.
• Understand team concepts including roles, responsibilities, accountability, and groups.
• Develop leadership skills through training, assignments, a service project, and other opportunities.
• Foster engineering leadership for the nation.

Application Period
Candidate applications are open from Oct. 31, 2018 through Dec. 21, 2018—and must be submitted through the individual’s Post President to the Regional Vice President.

For more information (including expectations of those in the program, curriculum highlights, and application details) visit www.same.org/ldp, or contact Eddie Gonzalez, SAME STEM Program Manager, at egonzalez@same.org.
Building the STEM Pipeline

The concept behind the SAME STEM Pipeline is that Posts connect with students (often at a young age) and stay connected through STEM events as they grow in school. The linkage can start early through a contact while a Post member judges a science fair and extend through the student’s participation at Post luncheons, attending a STEM camp, earning scholarships, being mentored, participating in college Student Chapters, and then joining the professional ranks of our government agencies and industry firms.

We ask Posts to apply this concept when developing their STEM programs and managing their tracking and reporting of students in their “pipeline.” As a Society, we have many great examples of the “Power of the Pipeline” and how you can make an impact on the future STEM professionals of our nation.

Making First Contact

The Great Basin Post—led by Roberta Schlicher—along with other engineering organizations, hosted a STEM booth at the Salt Lake City FanX Convention (formerly ComicCon). With over 100,000 visitors, the event was a major success. The STEM Program at Hill AFB donated an aircraft simulator and other gadgets from the Aerospace Museum and local defense businesses, making this a major attraction. While the kids liked the hands-on interaction and were awed by the experience, parents who attended gobbled up information on SAME camps and scholarship documents.

Staying Connected

Hearing from youth who have been positively impacted by SAME’s STEM outreach efforts is a reminder of the tremendous difference that we can make.

From Nolan Murphy, recent camper: “I attended the 2018 SAME/Air Force Academy Engineering & Construction Camp. I just wanted to let you know that I plan to become a cadet at the academy and I fully intend to keep my promise, if accepted, and come back to camp as a Cadet Leader.”

From Jake Lowery, recent camper: “School is pretty good. I’m taking AP Calculus, AP Physics, and Mechanics this year, and auditing Electricity and Magnetism, which is definitely the hardest class I’ve taken so far!”
REPORTING SUCCESS

When parents of students who have gone through the SAME Camps Program reach out, it is an incredible validation of what inspiration can do.

“I am happy to share that Alex Dunn, camper in 2017 (also an Eagle Scout), loved the camp! We delivered him to California Polytechnic and he will be studying engineering. Due to his AP units, he is entering college as a second semester sophomore. Many, many thanks for the great experience and opportunity.” – Christina Dunn

“The SAME STEM Camp changed my son Caden Meilner’s life. He came home three summers ago, confident that he wanted to work towards gaining an appointment to a service academy. “My son Ryne Rae, now a cadet at the U.S. Air Force Academy (Class of 2022), plans to major in Systems Engineering. His introduction to the academy was the SAME STEM Camp. He also was recently selected to play the tenor drums for the Drum & Bugle Corps. SAME touched the life of a young man who is going to help change the world someday. A big thanks to everyone involved.” – Tess Rae

He is now attending the U.S. Naval Academy (Class of 2022). We are so thankful for his experience and this excellent opportunity for our young people.” – Shauna Meilner

SEEING GROWTH

When students reach the age they are making decisions about their future, encouraging them to succeed can have a considerable benefit on their career path. From Miguel Connell, recent camper: “I had an amazing time at the SAME STEM Camp! I then had the opportunity to go to Columbus AFB for Specialized Pilot Training. We focused on learning to fly the T-6 Texan II. At the graduation, they gave us the real Air Force wings worn by pilots. I also went to Norwich University to attend an Advanced Cyber Forensics camp. I realized that this was another field in engineering that could eventually turn into a career. I also called the Admission Liaison Officer for my area to discuss an appointment to the Air Force Academy, and so far, I am on the right track. After having lunch with a representative of my SAME Post, I was invited to discuss the life-changing experience. Thanks for teaching me so much at camp and inspiring me and hundreds of other people to be future engineers.”
COMPLETING THE PIPELINE JOURNEY
Ultimately, parents can offer the best perspective upon a student’s journey—and what along the way helped them to find success.

“My son, Jason Prior, was an SAME camper in 2004. He always talked about becoming an engineer. A strong student, Eagle Scout and excellent soccer player, the soccer coach at Mercer University offered him a spot on the team, playing Division 1 college soccer balanced with calculus, physics and dorm life. Following his dreams, he played four years of soccer and earned a degree in Industrial Engineering and Business in 2009. He worked for a defense contractor on Warner Robins AFB and lately for Dick’s Sporting Goods, integrating suppliers with the product sales site. It is largely seeking solutions to get the right product on the website. He’s now 31, married with two sons. I am sure the SAME camp played a key role in cementing Jason’s desire to become an engineer and problem-solver. I talk about the SAME camp to anyone who will listen. Keep up the great work! I know the STEM Program is making a difference.” – Tom Prior

STUDENT CHAPTER INTERNSHIPS
Supporting aspiring STEM professionals with internships gives them actual experience they can grow and learn from.

Recently, the Pikes Pike Post organized student internships for cadets in its Student Chapter at the Air Force Academy. Among the placements, Cadet Isaac Kasten interned with the Directorate of Public Works at Fort Carson, supervised by Ed Wyka.

NATIONAL STEM AWARDS
Start planning your nominations for SAME’s national STEM Awards. The Society honors Posts and individuals in recognition of contributions to STEM with the STEM Champion Award and STEM Excellence Award. Visit www.same.org/awards for more information.

JOIN THE STEM COMMITTEE
All STEM Coordinators at the Post level should join the national STEM Committee to help link up local and national efforts. Send an email to sprosuch@earthlink.net and you will be added to the group.
FUNDING RESEARCH & DEVELOPMENT
The Small Business Administration (SBA) granted 24 awards for $125,000 in FY2018 under the Federal and State Technology (FAST) Partnership Program.
Recipients include state and local economic development entities, Small Business Technology Development Centers, Women’s Business Centers, incubators, accelerators, and colleges and universities. FAST award project and budget periods are for 12 months, and began Sept. 30, 2018.
The program is designed to stimulate economic development with outreach, training, mentoring, financial support, and business/technical assistance to research and development-focused small businesses, with an emphasis on fostering participation from women-owned, rural-based, and socially/economically disadvantaged firms to help them compete in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. FAST provides one-year funding to organizations to execute state/regional programs that increase the number of SBIR/STTR proposals (through outreach, training and financial support); increase the number of SBIR/STTR awards (through business assistance and mentoring); and better prepare SBIR/STTR awardees for commercialization success (through business assistance and mentoring).
Candidates were endorsed by each of their state and territorial governors, as each state may submit only one proposal. Proposals were then evaluated by reviewers from SBA, the National Aeronautics & Space Administration, National Institute of Standards & Technology, Department of Agriculture, Special Operations Command, Department of Homeland Security, Department of Energy, Missile Defense Agency, and the National Institutes of Health.
For more information, visit www.sbir.gov/about-fast.
(Contributed by SBA)

SURETY BOND GUARANTEE FEES
In September, SBA announced the first fee decrease in surety bond guarantees in 12 years. The decrease will be in effect for guaranteed bonds approved during FY2019, which took effect Oct. 1, 2018 and ends Sept. 30, 2019.
The Surety Bond Guarantee Program is reducing the surety fee from 26 percent to 20 percent of the bond premium charged to the small businesses and reducing its contractor fee from $7.29 per thousand dollars of the contract amount to $6.00 per thousand dollars.
Under the program, SBA guarantees bid, payment and performance bonds for small and emerging contractors that cannot obtain surety bonds through regular commercial channels. SBA guarantees contracts up to $10 million, including the streamlined QuickApp application for those up to $400,000.
SBA’s guarantee gives sureties an incentive to provide bonding for small businesses and, thereby, assists small
businesses in obtaining greater access to contracting opportunities.

Currently, there are 34 participating sureties and over 350 active agents in the program. On average, completed surety bond applications are reviewed and processed in less than two days. (Contributed by SBA)

PROGRAM AIMS TO BOOST INNOVATION

This summer, the General Services Administration (GSA) announced the launch of a pilot program to award and manage SBIR Phase III contracts. Awards will be made and managed by GSA’s Office of Assisted Acquisition Services during the pilot program, which will run through September 2019.

In late September, the first two awards were made: a $150 million award made to The Perduco Group in support of the U.S. Air Force’s Strategic Development Planning & Experimentation Office; and a $2.2 million award made to Discovery Machine Inc. in support of the Air Force’s Air Education & Training Command.

SBIR is a highly competitive awards-based program coordinated by SBA that encourages domestic small businesses to explore their research/research and development potential and provides an incentive for them to profit from its commercialization. The program is structured in three phases. Phases I and II focus on research/research and development; the objective of Phase III is to pursue commercialization objectives.

“GSA’s SBIR pilot is an exciting opportunity to bring innovative solutions into the federal marketplace, support American small businesses, facilitate job creation and strengthen our industrial base,” said GSA Administrator Emily Murphy. “Awarding SBIR Phase III contracts allows GSA to bring these cutting-edge solutions directly to our partner agencies.”

The new pilot program will help GSA determine how best to expand this research and commercialization service offering. The pilot will be led by Assisted Acquisition Services’ Great Lakes Region and Federal Systems Integration and Management teams. (Contributed by SBA)

WOMEN’S SMALL BUSINESS MONTH

In October, SBA recognized National Women’s Small Business Month and the countless women small business owners who have pursued their passion and taken the leap into entrepreneurship. Women are a driving force in the nation’s economy, starting most new businesses. They own 9.9 million companies that employ more than eight million people and provide $264 billion in wages to employees.

The growing number of women entrepreneurs has not happened by accident. A major contributor to the growth of women-owned small businesses is legislation that targeted the creation of resources and networks for women. This year the SBA also celebrates a milestone of
30 years since the passage of the Women’s Business Ownership Act (H.R. 5050), which was aimed at leveling the playing field for women-owned businesses. It officially established the SBA’s Women’s Business Center program.

The Women’s Business Centers were the first SBA program that focused on women. Today, there are over 100 centers across the nation, including nine new locations that opened this year. These centers provide services for women entrepreneurs—helping them to launch and grow businesses, invest in their communities, create jobs, and grow the economy.

“We know the impact that women have on our economy and the importance of women entrepreneurs,” said Kathy McShane, Assistant Administrator for the SBA’s Office of Women’s Business Ownership. “We want women entrepreneurs to feel confident taking a risk on starting and growing their businesses. Whether they are writing a business plan, connecting with a business mentor, or receiving a loan to start or expand their business, each woman can access resources available through the SBA.”

To help businesses overcome the barriers to start up, the SBA provides mentorship and counseling through the Women’s Business Centers, Small Business Development Centers, SCORE and the Veterans Business Outreach Centers.

Each year, the SBA counsels, trains and advises more than one million entrepreneurs and small business owners. Its resource partners provide access to capital, resources, and business expertise for each stage of a company’s lifecycle. *(Contributed by SBA)*

**SURVEY SHOWS BUSINESS OPTIMISM**

A recent report of the Small Business Optimism Index, issued by the National Federation of Independent Business (NFIB), soared to 108.8 in August, a new record in the survey’s 45-year history, topping the July 1983 highwater mark of 108.

Among the findings from the August survey showed that job creation plans and unfilled job openings both set records; the percentage of small business owners saying it is a good time to expand tied the May 2018 all-time high; and inventory investment plans were the strongest since 2005 and capital spending plans the highest since 2007.

A net 10 percent of all owners (seasonally adjusted) reported higher nominal sales in the past three months compared to the prior three months. August was the ninth consecutive strong month of reported sales gains after years of low or negative numbers. The net percent of owners planning to build inventories rose six points to a record net 10 percent, the 14th positive reading in the past 22 months.

“At the beginning of this historic run, Index gains were dominated by expectations: good time to expand, expected real sales, inventory satisfaction, expected credit conditions, and expected business conditions,” said NFIB Chief Economist Bill Dunkelberg. “Now the
Index is dominated by real business activity that makes GDP grow: job creation plans, job openings, strong capital spending plans, record inventory investment plans, and earnings. Small business is clearly helping to drive that four percent growth in the domestic economy.”
(Contributed by NFIB)

INVESTING IN MICRO-ENTREPRENEURS
A total of 32 community-based organizations that provide assistance to underserved entrepreneurs across the United States will receive a combined $5 million in grants from SBA’s Program for Investment in Micro-Entrepreneurs (PRIME).

These organizations help low-income entrepreneurs gain access to capital to establish and expand their small businesses. This year’s recipients come from 24 states and the District of Columbia.

The grants range from $75,000 to $250,000 and typically require at least 50 percent in matching funds or in-kind contributions. In total, 111 organizations applied for PRIME grants for 2018.

SBA placed special emphasis in this year’s competition on projects that will offer training and technical assistance to strengthen economically disadvantaged businesses, particularly those that service entrepreneurs in rural areas and HubZones.

This year’s awards also emphasized organizations participating in the SBA’s Community Advantage Program, which provides mission-oriented, nonprofit lenders access to the SBA’s 7(a) loan guarantees to help small businesses that have outgrown microlending but are not able to access more traditional financing including funding from SBA commercial lending partners. There were eight Community Advantage Lenders selected for PRIME grant awards.

For more information, visit www.sba.gov/content/prime-grantees.
(Contributed by SBA)

Submit Small Business News items, with high-resolution (300-dpi) images, to editor@same.org.

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Founded in 1920 in the aftermath of World War I "in the interests of patriotism and national security," SAME for nearly 100 years has helped build connections and bridge gaps around the world, whether in Europe, the Middle East, Southeast Asia, the Pacific, Alaska, or across the contiguous United States.

As SAME approaches its Centennial in 2020, our mission remains focused on collaboration and relationships—of bringing the military, public, private and academic sectors together in the interests of resolving national security infrastructure-related challenges.

Through our more than 30,000 members and 105 Posts, SAME can help you create lasting connections, broaden your network, and strengthen your career, while we work together to strengthen the engineering potential of the United States and enhance our national security.


www.same.org/join
HISTORICAL PERSPECTIVE

Unique HAWK MISSILE Sites, Okinawa

Editor’s Note: The following article, “Unique Hawk Missile Sites, Okinawa” was first published in the January-February 1965 issue of The Military Engineer. Construction of the Hawk missile sites was intended for protection against possible attacks via aircraft. However, this unprecedented design presented challenges that included technical aspects, safety precautions and environmental factors due to the island’s location. The obstacles were complex, but military engineers persisted and were able to successfully manage construction timelines to meet deployment dates.

By Lt. Col. Gerson Mandel, USAFR
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A number of troop bases, depots, airfields, ports, and other facilities have been constructed in Okinawa for the United States Army, Navy, Air Force, and Marine forces that are assigned there. Prior to 1958, conventional artillery provided anti-aircraft protection for the island and these facilities. The artillery was replaced in 1958 by Nike missiles for protection against high-flying aircraft, and now the Hawk missile system has been installed to oppose low-flying attacks. The Hawk is especially effective for this purpose because it is equipped with radars designed to detect and track low-flying aircraft. The missile is 16 feet long and 14 inches in diameter. It uses a solid-fuel propellant.

The initial installation of Hawk missiles in the air defense system of Okinawa provided a challenge to military engineers because of many physical and elemental problems unique to that location. The original plan for the Hawk system was for permanent emplacements. This plan was changed for the Army to provide only mobile equipment for field use. Construction of the Hawk missile sites on Okinawa was then changed to emplace field-type mobile equipment at fixed installations. This change, which came late in the planning, presented a complex design problem, particularly since it was to be a one-of-a-kind design to fit a funding program that was already established. Typical fixed sites with buildings and other facilities to accommodate permanently emplaced equipment had already been designed, and could serve as the basis for the Okinawa sites, but considerable changes were needed to accommodate the mobile equipment.

Siting of each Hawk battery required tactical and technical considerations and real estate acquisition. Tactically, each battery had to be located within a given area for the protection of certain military installations. Technically, each site had to be in an area suitable for economical construction—near power, water, and roads, and with good radio reception possibilities but with tolerable radar and missile masking potentials. Distance limitations for safety with respect to explosives required large areas, and not already in use or which would not present acquisition problems could be considered. Desirable areas were selected first, and an engineering feasibility study was made of from three to five locations in each area.

Some of the mobile equipment required installation under cover from the tropical climate and typhoons. Three mobile vans, containing the facilities for the Battery Control Center, Supply, and Data Control, were installed in an air-conditioned operations building. A generator building was provided to house mobile 400-cycle generators and converters for the 60-cycle commercial power, and all were sited within an area fixed by cable lengths which were part of the mobile equipment package. Other adaptations were a missile service building for a mobile repair test van and for assembly and check-out of the missiles, and a building for the storage of spare missiles on mobile trailers. Four mobile radars were sited so as to permit them to function with maximum efficiency without intolerable masking and within certain critical distances from each other.

Since typhoons strike Okinawa usually about twice each year, with winds of over 100 mph, typhoon protection was an important consideration. The winds carry salt-laden air in horizontal masses and batter everything in their path, so protective cover for all personnel and equipment that would be susceptible to typhoon damage had to be included in the construction.

Constant pressure was exerted during the construction time to meet deployment dates. The sites have now been occupied and stand as a fine example of unique military design and construction.
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