Winter 2024

Army Engineer

Magazine

An AH-64 (Apache) provides security for the 74th MRBC during Remagen Ready 24-01 at Fort Cavazos, TX.

EXECUTIVE DIRECTOR

AEA
ARMY ENGINEER ASSOCIATION

Fellow Engineers,

I'd like to personally wish all of you a wonderful New Year. As we embark on this new year, my hope is that everyone is able to grow in their faith, family and profession. The past few months as the AEA Executive Director have been extremely busy for me, however it's been extremely rewarding. I look forward to this new year, working for your Engineer Association. As much as possible, I'd like to update the Regiment on ongoing and future events as we know them currently:

- The Guardians of the Castle fund drive is still open for donations. I want to personally thank those who've donated to date. We cannot support the Engineer Regiment without your generous support.

- This past Veterans Day, we rolled out the AEA Career Bridge. This is an online tool that links transitioning engineers with Industry. Any Engineer Soldier (Specialist through Colonel) seeking civilian employment can access job posting by a wide array of businesses inside and outside the engineer profession to see what jobs are available. If you would like to participate in the Career Bridge Program please go to: https://jobs.armyengineer.com/.

- As many of you know, the big change this year is the consolidated MSCoE Protection & Regimental (EN, CBRN, MP) Senior Leader Forum which will be held **22-26 JUL 24 at Fort Leonard Wood, MO**. This decision also consolidated the Industry Exposition into one (instead of three, one for each Regiments on Fort Leonard Wood). We have been working with both Military Police and CBRN Regimental Associations to provide a world class event supporting the MSCoE Protection & Regimental forum.

- The Engineer Regimental Week is scheduled for **22 -26 April 2023 at Fort Leonard Wood, MO.** Currently, the Regimental week will include Best Sapper competition, Fallen Sapper Memorial, Regimental Awards, Regimental Ball along with senior leader events such as FFE, EBOD, and Home on Home followed by ENTAPE. As we get updates, I'll ensure that information is sent out as soon as possible.

- The **Castle Ball is currently scheduled for 9 August 2024**. We are in the process of finalizing the location. Once complete, I'll get it out to all.

- We are making some improvements to the products being sold in our store and online. Please let us know if there are products you would like to see added to what we have so far. We will continue to add other items as we strive to improve our support to all of you.

- Finally, I would like to ask all AEA members to log into your respective accounts and verify all information is correct, especially if you've moved or changed e-mail addresses and haven't updated the data. This helps us get information out quicker and limits the issues with using our systems. The AEA transitioned to a more secure database last year and in doing so, some of the member IDs were changed. Once you log into your account, you'll be able to see if your number has changed.

Again, I hope everyone has an incredible New Year. Please reach out to me with any questions or feedback at xd@armyengineer.com.

Sincerely,

Jim Rector

James "Jim" V. Rector
Colonel, U.S. Army, Retired
Executive Director

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ARMY ENGINEER MAGAZINE

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Linda S. Mitchell, Editor
Army Engineer Magazine

Hello! This time of year is a time of reflection into the past and looking towards the future with aspiration. Each year hundreds of young people from every walk of life join the Engineer Regiment and succeed. They become innovative leaders and expert professionals continuing the legacy of greatness in the Engineer Regiment. I look forward to continuing to explore their stories this year.

I would like to take this opportunity to thank you for your engagement, membership, and support. I wish you and your family a New Year filled with happiness, health, and good fortune.

Best,

Linda

In This Issue...

REGIMENTAL AWARDS

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- White/ Black and Red castle design.
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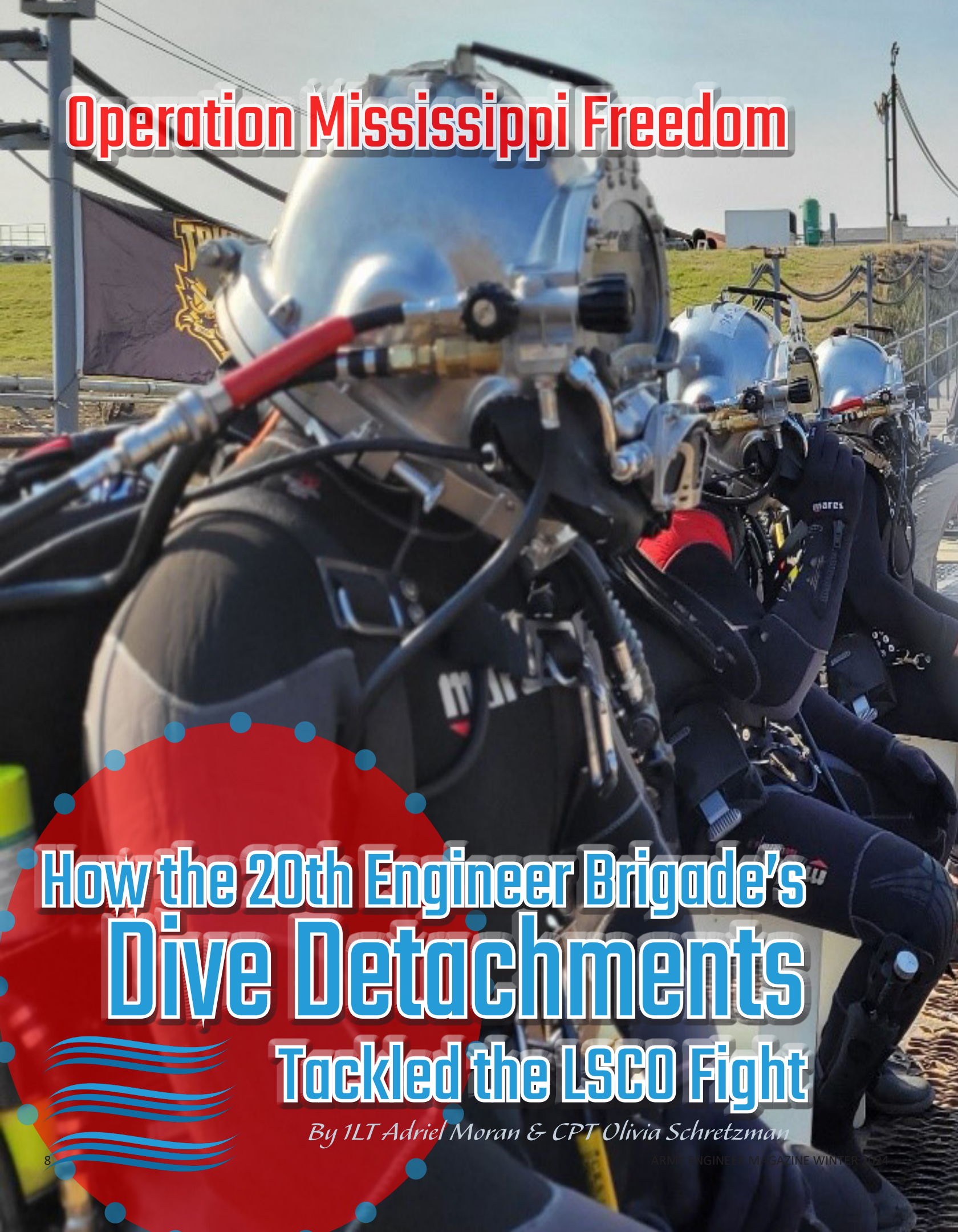
Operation Mississippi Freedom



How the 20th Engineer Brigade's Dive Detachments Tackled the LSCO Fight

By 1LT Adriel Moran & CPT Olivia Schretzman

Since World War II, the United States Army's Engineer Divers have been hard at work clearing obstacles, repairing ports, and enabling the deliberate flow of equipment and sustainment through strategically important Seaports of Debarkation (SPODs). The highly trained and technically proficient formations, also known as Engineer Dive Detachments (EDDs), support all geographical combatant commands building the combat power necessary for future Large-Scale Combat Operations (LSCOs) throughout the world.

The 25-Soldier EDDs deploy worldwide, performing complex and dangerous engineer tasks at depths up to 190 feet underwater. These tasks include surface supplied or "hard hat" diving, SCUBA, hydrographic surveys, underwater inspections, swift water diving, demolition, construction, and hyperbaric chamber operations. One of the most vital missions for an Engineer Diver, or 12D, is port opening and harbor clearance operations, including underwater welding, hydraulic tools, underwater cutting, lift bag operations, and clearing obstacles and debris.

Today, the U.S. Army "Deep Sea" Divers from the 92nd Engineer Battalion, 20th Engineer Brigade, are rotationally deployed to support Operation Spartan Shield's Shuaiba Port, a strategic logistical hub in CENTCOM. Engineer Divers keep the port free of debris and conduct force protection operations to enable military watercraft to transfer logistical supplies throughout the region. While there is a limited threat from a near-peer in Kuwait, the mission set highlights one of 20th EN BDE's largest and most important mission essential tasks: port opening and harbor clearance.

Training on Port Opening and Harbor Clearance

The 20th Engineer Brigade, stationed out of Fort Liberty, NC, owns four operational EDDs, with the 86th EDD deployed to CENTCOM for a 12-month rotation. The other three, 74th, 511th, and 569th, are stationed at Fort Eustis, VA, training on individual and collective tasks to prepare for the next LSCO fight. "The highest risk and resource-intensive MET [Mission Essential Task] we collectively train on is port opening and harbor clearance," states CPT Olivia Schretzman, the Commander of the 511th EDD. "If we do not provide accurate infrastructure assessments, open ports, repair bridge sections, or clear obstacles in inland waterways, we negatively impact all sustainment and maneuver operations. It is a no-fail mission."

The 511th EDD Commander planned and resourced a real-world port opening collective training exercise to train and certify Soldiers on this critical task. "It is hard to simulate a damaged bridge or a sunken vessel," explained CPT Schretzman. "The USACE Memphis District reached out to the Army for help earlier this year and we realized we had a mutually beneficial requirement - the Ensley Engineer Yard had a partially sunken bridge that needed repairs, and we needed high-intensity port opening training." This operation became known as Operation Mississippi Freedom.

Operation Mississippi Freedom

Operation Mississippi Freedom consisted of a 28-day joint operation to repair the Ensley Engineer Yard's partially sunken 161ft by 30ft bridge. The bridge is a vital piece of the Memphis District infrastructure. It is one of only two access points to the fleet of dredges and material barges that transport over 175 million tons of cargo along the Mississippi River. The Memphis District is directly responsible for servicing 355 miles of the Mississippi River watershed, and failure to maintain these operations could cost the nation over a billion dollars in fuel and shipping costs.

To assist the USACE Memphis District, the 511th EDD immediately began the systematic planning and resourcing required for an operation of this scale. The 511th EDD organized their OPORD into three phases: Preparation and Battle Damage Assessment, Execution (waterproofing,

external patch emplacement, internal patch emplacement, and QA/QC), and Recovery. After conducting multiple legal, project, and Economy Act reviews, and building an off-post training packet, the USACE Memphis District approved a mission budget of $230,000 for the 20th EN BDE. The budget included rations (CLI), equipment (CLII), POL (CLIII), and CL IV (construction material (BOM)).

On 7 March 2022, the 511th EDD executed a leader's reconnaissance to establish communication with USACE Memphis Project Managers, collect intelligence, and build a bill of materials list prior to execution. The 60-year-old six compartment bridge section had a rusted-out hull and ten ruptures ranging from one-inch holes to ten-foot large cracks. A significant outcome of the reconnaissance identified the need to use a double-sided patch technique, a technique that provides an additional layer of protection. Due to the low tide in the summer months, the bridge section sits on the bottom of the river bed creating friction points and massive cracks. An internal reconnaissance was unavailable due to limited visibility and risks posed by confined space air quality; however, the external dives were enough to develop a bill of materials list and plan of attack.

Armed with the updated intelligence and BOM list, the team deployed 23 Soldiers from the 511th, 74th, and 569th EDDs and over two-thirds of the detachment's MTOE'd equipment. The detachment developed a detailed plan outlining the emplacement of waterproofing material on the outside of the bridge to limit the water flow in each compartment. The Ensley Engineer facility had a perfect CLIV and local scrap yard for the operation. Additionally, a machinist shop onsite provided labor, tools, and supplies to complete the bridge repair. This form of resource procurement is prevalent for engineers when deployed and provides the opportunity for Soldiers to think outside the box.

The most pivotal phase in salvaging the sunken bridge, was reducing the water inflow to each compartment to allow internal and external patching. The divers emplaced waterproof fabric (industrial tarps) along the hull, which reduced water flow by nearly 95%. Waterproofing allowed divers to enter each compartment to identify holes and other significant damage.

External patch emplacement acted as additional protection from further punctures during low water seasons. The "Texas Patches" consisted of eight 4ft by 8ft plywood sheets bolted to two steel 31ft straps. Individual plywood sheets are too buoyant and unmanageable for divers to emplace, so 1LT Moran and SSG Griffith calculated the required amount of steel to provide slightly positive buoyancy. They determined that eight sheets bolted together could achieve a maneuverable 304 ft patch, equivalent to the length of three HMMWVs. The total area covered by the eight Texas Patches spanned over 2,500 ft2, equal to the size of 25 dump trucks. These patches were the largest external patches installed in Army Engineer Dive Detachment history.

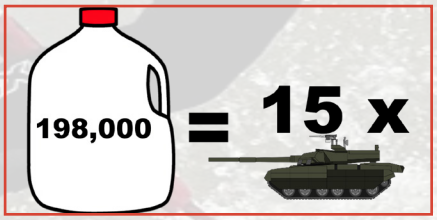
The divers were broken down into four dive teams, before entering the dewatered compartments, where they worked together to build patch designs for their sections. The divers executed internal patch construction, primarily using scrap metal due to resource limitations. The largest and most complex patch installed in the hull utilized salvage matting and over 100lbs of concrete to reduce water flow. Effective internal patch installation reduced flooding of the bridge in all compartments by 95% and raised the bridge out of the water by over 3 feet. Raising the bridge out of the water increased the bridge's load capacity, reduced utility costs, and removed electrical safety concerns. To validate the emplacement of all internal and external patches, the 511th EDD inspected each internal and external patch before performing sweeps in and around the bridge. Sweeping techniques yielded the removal of several hundred pounds of concrete rock, tree roots, and metal scrap.

At the end of the operation, the 511th EDD removed 198,200 gallons of water (equivalent weight of 15 Abrams) from the bridge. The detachment conducted 23 dives, with over 1400 minutes of bottom time, and emplaced five 30ft by 50ft non-permeable fabric sections, eight steel/wooden 39ft by 8ft patches, and ten steel/concrete internal patches. The hard work and ingenuity of the 511th EDD resulted in the bridge successfully operating without the use of the dewatering electrical pumps for the first time in over 25 years, saving the U.S. Government over five million dollars in a replacement bridge.

Finally, Operation Mississippi Freedom showcased how innovation and resourcefulness can solve one of the Engineer Regiment's most complex problems, port opening and harbor clearance. The 511th EDD expertly managed high risk diving operations and successfully re-established a LOC spanning over 355 miles of the Mississippi River. Operation Mississippi Freedom proved the diverse capabilities of the 20th EN BDE and the importance of conducting realistic joint training, and highlighted how EDDs are integral to the success of LSCOs.

Photos Right: SSG Deitzler and SGT Blaylock preparing concrete to pour into forms/ CPT Oliva Schretzman removing excess debris from compartment #2/ SSG Mansilla and PFC Paavola removing debris from compartment #1/ 511th EDD/ Concrete patch construction in compartment #2 emplaced over a ten foot crack./ Pressure patch construction in compartment #3 leveraging vertical and horizontal applied force. / Floor concrete patch emplacement in compartment #4/ Team Trident (511TH EDD) commemorating CTE completion.

Graphics below: The difference in original freeboard (red) vs. improved freeboard (blue). / The weight of water removed equivalent to number of Abrams tanks.



1LT (P) Adriel Moran is currently a Task Force Engineer for Joint Task Force Bravo, Honduras. He served as the Executive Officer for the 511TH Engineer Dive Detachment (January 2022-March 2023). Adriel received a degree in Civil Engineering from the USMA at West Point.

CPT (P) Olivia Schretzman is a lead Engineer Observer, Coach/Trainer at the National Training Center. She has served numerous roles in the Engineer Regiment from Sapper Platoon Leader to Construction Officer for Operation Inherent Resolve to previously commanding the 511th Engineer Dive Detachment. She holds a Masters Degree in Engineering Management from Vanderbilt University.


511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20TH ENGINEER BRIGADE'S

Recent fighting in Gaza and large-scale combat operations in Ukraine highlight the importance of the ability to breach hardened facilities in dense urban terrain and the subterranean component. Russian Armed Forces' attempted invasion of Kyiv in spring 2022 highlights recent fighting in dense urban terrain, as nearly three million Ukrainians reside in the city. Furthermore, the current Israel-Hamas war perfectly captures the subterranean aspect of warfare, as the Israel Defense Forces are attempting to intrude and overcome the sophisticated tunnel system established by Hamas under the Gaza Strip. Each conflict presents a unique challenge on the modern battlefield, as units are conducting forceable entry missions into facilities both above and below ground. Currently in the U.S. Army, the only units trained and equipped to conduct heavy breaches into dense urban terrain and the subterranean environment are found in Special Operation Forces (SOF). However, in September 2022, the XVIII Airborne Corps Commander, LTG Christopher Donahue, tasked the 20th Engineer Brigade with establishing a Specialized Breaching Platoon "to support urban operations (UO) in complex, hardened or subterranean (SbT) environments." As a result, the 20th Engineer Brigade's 57th Sapper Company (Airborne) (Rough Terrain) is home to the Army's only conventional Specialized Breach Platoon at Fort Liberty, NC. Currently, the platoon consists of fifteen breachers who use special equipment with specialized training to meet their mission-specific requirements.

The Specialized Breach Platoon has overcome several challenges in gathering the necessary equipment to conduct its training. When the platoon stood up in the fall of 2022, 1LT Braxton Foote and SFC Adam Wood quickly realized the need to understand what the mission set truly is, and by using Army Technical Publication 3-21.51 "Subterranean Operations" as a guide, they sought out partners in the SOF community with a similar mission set. To defeat hard targets in a unique environment, the Specialized Breach Platoon continues to utilize unique explosives, exothermic Broco rods and torches, and manual breaching assets to conduct heavy breaches. During training events with SOF partners, it understood what specific equipment was required in the subterranean environment specifically. The platoon spent over $1 million on mission-specific equipment such as self-controlled breathing apparatuses (SCBA), 3M respirator masks, and industrial-sized oxygen bottles. Once the platoon began to train specifically on their mission set with newly acquired equipment, they conducted a full-mission profile validation in July 2023 with partner forces at Muscatatuck Urban Training Center (MUTC) at Camp Atterbury, IN. During the training event, the platoon conducted several validation lanes by conducting breaches in both urban terrain and the subterranean domain. Similarly, the platoon conducted a specialized breach mission at the Joint Readiness Training Center (JRTC) in October 2023. The platoon's success at MUTC and JRTC validated their capability and set the framework for future training opportunities.

As with any new unit that stands from the ground up, the Specialized Breach Platoon faced several challenges

The 20th Engineer Brigade's Specialized Breach Platoon Conducts Exothermic Breaching & Conducts Mechanical Breaching at MUTC. Photos are courtesy of 20th EN BDE.

SPECIALIZED BREACH PLATOON

BY 1LT TYLER WETZEL

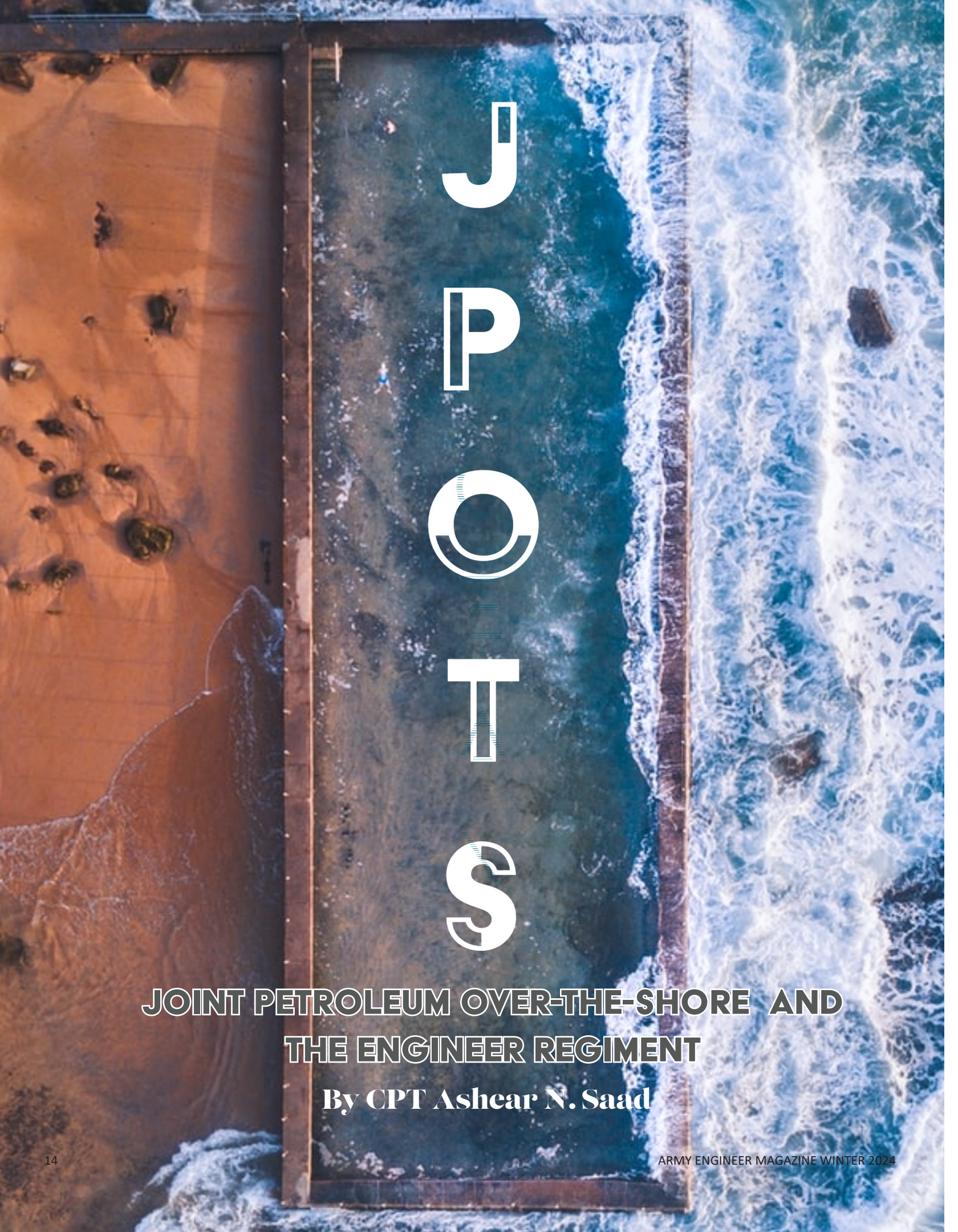
from its inception. First, the platoon lacked the knowledge in acquiring equipment to conduct self-sustained training. The platoon lacked the knowledge on how to spend large sums of money through DOD channels, as we were required to purchase off-the-shelf items and equipment not found in the Global Combat Support System - Army (GCSS-Army). Once a budget for our platoon was established at the Corps level, the platoon navigated DLA purchase options by phasing several purchase orders based on priority of equipment. Second, the platoon lacked the time in its schedule to train; this is an ongoing issue. Because the platoon falls in a sapper company, the current Mission Essential Task List (METL) for the platoon is specific to an airborne sapper platoon and not a specialized breach platoon. There were no METL tasks that aligned with the specialized breach mission. Therefore, the platoon was required to train both as conventional sappers and as specialized breachers simultaneously.

Lastly, the platoon struggled with bridging the gap of its mission set with its maneuver counterparts. The Specialized Breach Platoon is enablers with a task to defeat hard targets in specific domains. Maneuver elements, such as light infantry from the 82nd Airborne Division, are tasked to assault through the open breach and continue its follow-on mission. Because the platoon's knowledge of hard target defeat was not spread to maneuver commanders in the XVIII Airborne Corps, the platoon has yet to conduct prolonged training with its XVIII Airborne Corps maneuver counterparts. Despite its challenges, the Specialized Breach Platoon has plans in motion to address these challenges and continue to grow as a specialized capability in the Army.

With the Specialized Breach Platoon's acquisition of necessary equipment and validation of its training, the 57th Sapper Company plans to begin converting its entire formation to specialized breachers in FY24. The realignment of formations in the Engineer Regiment across the U.S. Army paired with the necessity of specialized breaching in Gaza and Ukraine has led to the company's planned convergence. It's forecasted that other engineer units in I and III Corps will follow suit and stand up specialized breachers of their own to support its maneuver counterparts. However, currently the Specialized Breach Platoon will continue to train for its mission with its newly acquired equipment.

The platoon plans to conduct another full-mission profile, with a maneuver counterpart, in FY24 to validate its training. In just over a year, the Specialized Breach Platoon has established a presence within the breacher community training closely with entities such as the Irregular Warfare Technical Support Directorate (IWTSD) and the National Center of Urban Operations (NCUO). Starting with no specialized equipment or training, the platoon has reached a point of completing full-mission profiles supporting maneuver elements. Now that the specialized breaching capability has stood up in the conventional Army, it is imperative this mission continues to spread across formations throughout the entire U.S. Army in preparation for a LSCO.

1LT Tyler Wetzel serves as the Platoon Leader for 57th Sapper Company's (Airborne) (Rough Terrain) Specialized Breach Platoon at Fort Liberty, NC. Hailing from Ohio, 1LT Wetzel earned his commission through West Point in 2022. He has served as the Specialized Breach Platoon Leader since August 2023."



JPOTS

JOINT PETROLEUM OVER-THE-SHORE AND THE ENGINEER REGIMENT

By CPT Ashear N. Saad

In the small town of Weipa, in Far Northern Queensland, Australia, U.S. Army Engineers from 130th EN BDE and 610th Engineer Support Company (555 EN BDE) participated in Joint Petroleum Over-The-Shore (JPOTS) with U.S. Army Quartermasters from 475th Quartermaster (POL) Group and 339th Quartermaster Company (19 ESC), as well as U.S. Navy Seabees from Amphibious Construction Battalion 1 (Naval Beach Group 1). This task was a first for most Engineer units in recent history. The JPOTS mission is a part of the Joint Logistics Over-The-Shore (JLOTS) mission set which many sustainers are familiar with. The Engineer Regiment plays a critical role in terrain shaping and construction of the Inland Petroleum Distribution System (IPDS) to facilitate the JPOTS mission. The JPOTS TF was comprised of ten U.S. Army Active units, one U.S. Army Reserve unit, and one U.S. Navy unit to demonstrate a proof-of-concept for a 3.2-mile pipeline trace in an austere environment utilizing fresh water rather than petroleum. The JPOTS mission was part of Talisman Sabre 2023, a USINDOPACOM biennial, multi-lateral exercise with the Australian Defense Force (ADF). Talisman Sabre is designed to improve US/AUS combat readiness and interoperability, maximize combined training opportunities, and conduct maritime prepositioning and logistics operations in the littoral training areas of Australia. 130th EN BDE, being under 8th Theater Sustainment Command (8 TSC), was tasked to develop and validate a JPOTS capability connecting existing tactical fuel distribution systems from offshore to fuel sources located beyond the high-water mark.

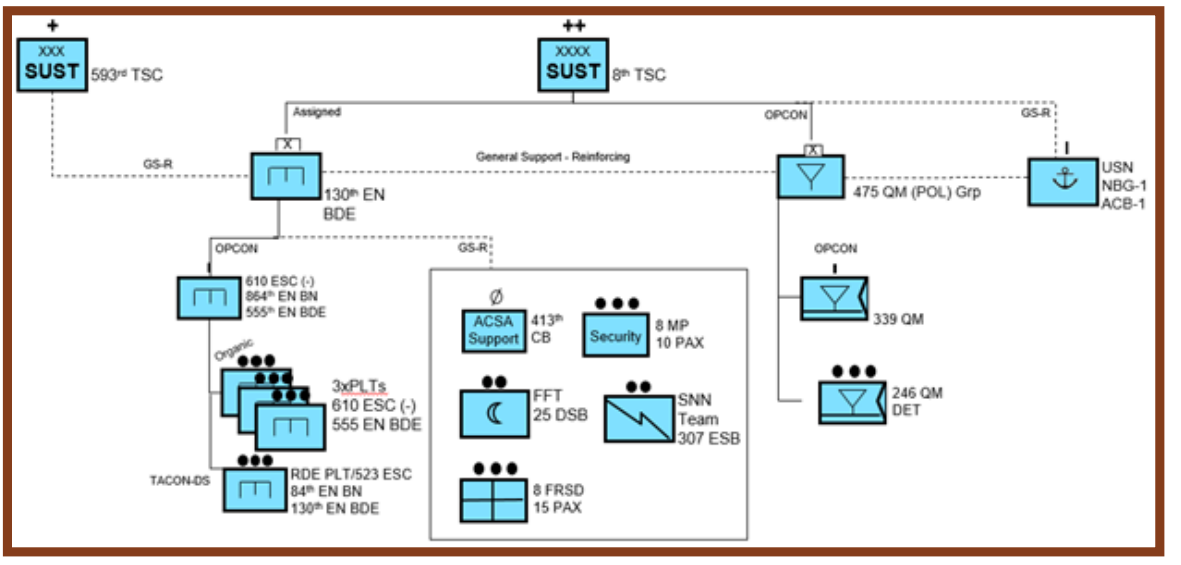
JPOTS Overview

The Joint Petroleum Over-The-Shore mission is a subset of Joint Logistics Over-The-Shore, which is the loading and unloading of ships without the benefit of fixed port facilities in either friendly or undefended territory and, in time of war, during phases of theater development. JLOTS operations are conducted over unimproved shorelines, through fixed ports not accessible to deep draft shipping, and through fixed ports that are not adequate without the use of JLOTS capabilities. The JPOTS mission set follows the JLOTS mission set, as equipment and vehicles are getting offloaded, they require fuel. If the specific terrain does not support existing structures and facilities to provide a refueling capability, the Inland Petroleum Distribution System (IPDS) must be planned, terrain shaped, constructed, and become operational. The IPDS is a rapidly deployable bulk fuel storage and pipeline system providing bulk Class III petroleum fuels to operating forces during combat and contingency operations. The IPDS is an effective means of moving large quantities of bulk Class III products currently in the military inventory. In order for the IPDS to receive the bulk Class III - or in this case, fresh water - an Offshore Petroleum Discharge System (OPDS) is required.

The U.S. Navy is responsible for the OPDS capability, providing the delivery of fuel up to eight miles offshore to the beach high-water mark. The Amphibious Bulk Liquid Transfer System (ABLTS) hose reel is the conduit which the liquid can transfer from Offshore to Onshore, which the U.S. Navy is primarily responsible. The U.S. Navy is not responsible for providing the offshore vessel for storing the bulk liquid, strictly the operation of the ABLTS. The ABLTS is mounted on a vessel and a messenger line is shot to the high-water mark on-land. Once the U.S. Navy crew on-land retrieves the ABLTS hose reel, they are to connect to the Beach Terminal Unit (BTU). The BTU is the point where the U.S. Navy relieves responsibilities of the hose/pipe. The U.S. Army affixes a flexible hose line to the BTU to begin the initial pipeline trace of the IPDS. Engineers are responsible for the design and construction of the IPDS pipeline trace for the Quartermasters to operate and maintain. Upon establishment of Pump Stations and various components of the IPDS, the Quartermasters are able to Fill, Pressure Test, Validate the pipeline trace, and ultimately certifying for refueling operations.

Task Organization

For Talisman Sabre 23, 130th EN BDE was responsible for the planning, preparation, and execution of the JPOTS mission. The first critical task was to ensure the task organization is correct. Doctrinally, a Theatre Engineer Command (TEC) or Engineer Brigade is aligned with a Quartermaster (POL) Group



Talisman Sabre 23

Mission Statement:

JPOTS TF executes Joint Petroleum Over The Shore (JPOTS) operations IVO Weipa and RAAF Scherger JUL 2023 IOT utilize the Amphibious Bulk Liquid Transfer System (ABLTS) and the Inland Petroleum Distribution System (IPDS) as proof-of concept to validate a theatre opening task.

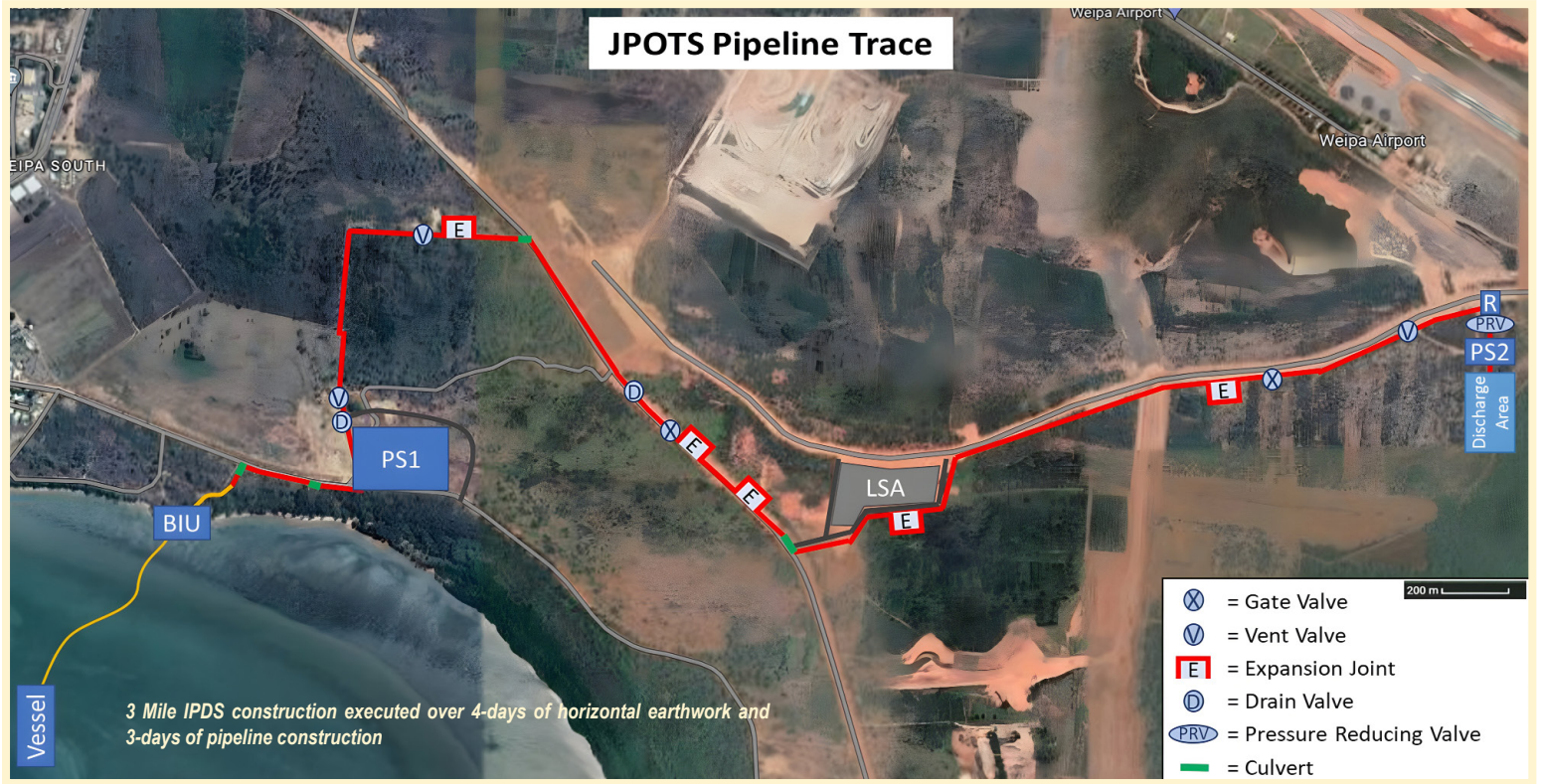
Key Tasks:

1. Construct, Fill, Pressure Test, and Validate the In-land Pipeline Distribution System (IPDS).
2. Establish the Beach Interface Unit and Beachhead.
3. Deliver 175,000 GAL of fresh water to the IPDS at the BIU site.
4. De-construct and recover the IPDS.
5. Establish base life support at RAAF Scherger

Highlights:

Planning/Deployment
LSA Operations
IPDS Construction
IPDS/ABLTS Operations
Partnerships

Photos top to bottom: DVIDS MAJ Jonathon Daniell - Amphibiou Construction Battalion One (ACB-1) connecting the ABLTS Hose Reel./ 24 QM DET briefs JPOTS TF TTPs for elbows in the IPDS trace./ Fresh wate from the offshore platform completing it's journey to Pump Station 2 fo discharge./ 6k Bag filled up from fresh water via the ABLTS Hose Reel. A photos are courtesy of the U.S. Army.



(BDE level echelon) and an Echelon Above Brigade (EAB) EN BN is aligned with a POL Support BN. Both of these echelons would assume responsibilities for certain parts of the operations. The Engineers are responsible for the construction phase with the Quartermasters assisting primarily with Subject Matter Experts (SMEs) to assist the Engineers during construction. Once construction is complete and the Quartermasters certify the pipeline, they will then assume responsibilities with the Engineers in a support role for any repairs. Moving below in echelon, the Engineer BN would be responsible for their organic Headquarters and Headquarters Company (HHC), Forward Support Company (FSC), Engineer Construction Company (ECC), Engineer Support Company (ESC) or ECC, with augmentation from a Military Police Platoon, Signal Team, Field Feeding Team (FFT), and a PLS Truck Company or Inland Cargo Transfer Company (ICTC). The POL Support BN would be responsible for a Petroleum Pipeline and Terminal Operations (PPTO) Company. Additionally, a Naval Support Element (NSE) would be General Support to both the Engineer and Quartermaster units. For the JPOTS mission during Talisman Sabre 23, 130th EN BDE acted as the Army Forces HQ (ARFOR) responsible for 610th ESC (555 EN BDE), with augmentation from a Rapidly Deployable Earthmoving (RDE) PLT from 523 ESC (130th EN BDE), a Signal Team (307 Expeditionary Signal BN), FFT (25 Division Sustainment Brigade), and MP Section (8 MP BDE). 475 Quartermaster (POL) Group acted as the Quartermaster Command and Control responsible for 339 QM CO. Lastly, Amphibious Construction Battalion supported the offshore effort. In total, there were 12 units (U.S. Army and Navy) from 4 different geographical areas, completing one mission set.

Resourcing and Sustainment

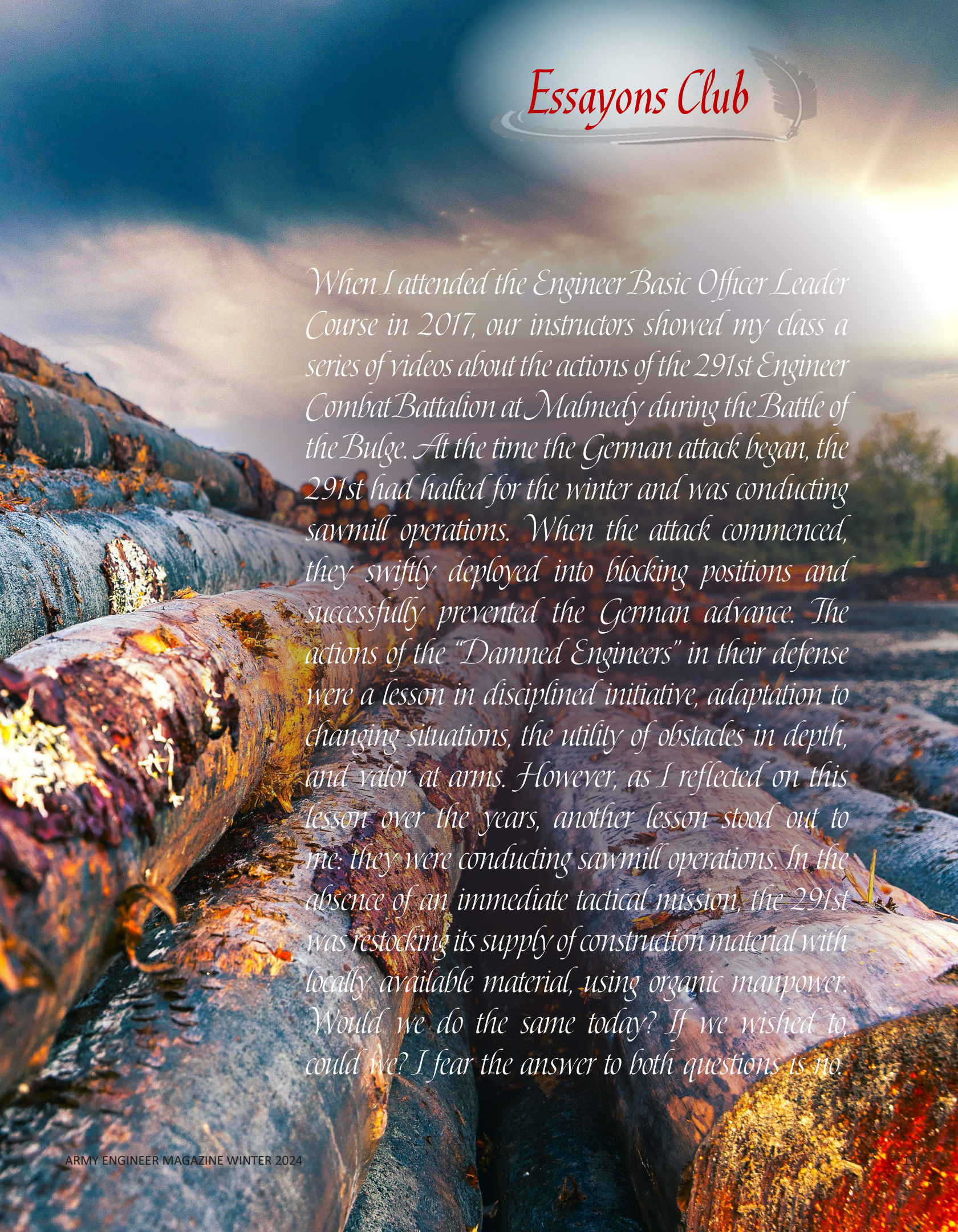
Resourcing and sustainment planning occurred months prior to execution. In the traditional fashion for exercise planning, planners from 130th EN BDE attended the Mid Site Survey/Planning Conference, and ultimately the Final Site Survey/Planning Conference. During each progression in the planning process, more and more resources would begin to lock in. The JPOTS mission during TS23 was executed in Weipa, Far North Queensland, Australia, which challenged the sustainment planners. Initial resourcing began by identifying the requirements needed to execute the mission, such as: billeting, food, rental vehicles, Wi-Fi "pucks", engineer equipment, etc. Once requirements were identified, the Australian Defense Force (ADF) utilized the Acquisition and Cross-Service Agreement (ACSA) to fulfill Mutual Logistics Support Requirements (MLSRs) for the U.S. Department of Defense. Whatever the ADF declined to fulfill, the 413th Contracting Brigade stepped in to create a valid Contracting Requirements Packet (CRP) to source from local vendors in Australia. The benefit of using the ACSA was the expediency sourcing of requirements that the U.S. Army, using their traditional contracting methods, would take longer. The ADF sourced billeting utilizing Royal Australian Air Force (RAAF) Base Scherger, basic life support at a Logistics Support Area (LSA), and personnel/equipment movements, just to name a few. ***For Part II of this article in the Spring 2024 issue will focus on the challenges of moving equipment and personnel to Australia, the Reception Staging, Onward Movement, and Integration (RSOI), life support while in country, Community Relations, mission execution, lessons learned, and future IPDS/E2FDS missions for 130th EN BDE and USARPAC.***

CPT Ashear N. Saad is an Active Duty Engineer Officer currently acting as the Commander for HHC, 411th Engineer Battalion (Reserve) at Fort Shafter Flats, HI. He was previously a part of 130th Engineer Brigade at Schofield Barracks, HI where he was the Assistant Brigade Plans Officer. He was the main planner for the Joint Petroleum Over-The-Shore mission, a part of Talisman Sabre 2023.

SOURCING MATERIALS FOR EXPEDITIONARY CONSTRUCTION

BY CPT EUGHAN MATTHEWS

Essayons Club



When I attended the Engineer Basic Officer Leader Course in 2017, our instructors showed my class a series of videos about the actions of the 291st Engineer Combat Battalion at Malmedy during the Battle of the Bulge. At the time the German attack began, the 291st had halted for the winter and was conducting sawmill operations. When the attack commenced, they swiftly deployed into blocking positions and successfully prevented the German advance. The actions of the "Damned Engineers" in their defense were a lesson in disciplined initiative, adaptation to changing situations, the utility of obstacles in depth, and valor at arms. However, as I reflected on this lesson over the years, another lesson stood out to me: they were conducting sawmill operations. In the absence of an immediate tactical mission, the 291st was restocking its supply of construction material with locally available material, using organic manpower. Would we do the same today? If we wished to, could we? I fear the answer to both questions is no.

There Are Some Things Money Can't Buy...

Our default methodology, contracting with local vendors to have material delivered to our project sites, has been reinforced by centuries of practical experience. At least as far back as Joseph Totten's work at Fort Adams two hundred years ago, military engineers have relied on local vendors and contractors for the rapid and timely acquisition of quality construction materials. In normal times, employing local vendors is prudent. Contracted sourcing can be fast, effective, and relatively cheap. Equally important, engineer soldiers who would otherwise be spending their time sourcing materials can instead focus their efforts on the actual execution of construction operations. Likewise, we should not discount the strategic value of bolstering local economies in a foreign land; we often win hearts and minds by putting dollars in pockets. When local contracting is not suitable, such as for specialty items, the military supply system can take up the slack to ship necessary materials to a project site as-needed. Few construction projects in peacetime are so urgent that the time to ship supplies is infeasibly long.

Unfortunately, large-scale combat operations, especially in expeditionary operational environments, are not normal times. Admiral Hyman Rickover's maxim that "the art of war is the art of the logistically feasible" will doubtless remain as true for the next conflict as it has in the past. In a supply system that will no doubt be stressed to its limits, every reduced logistical burden enables increased combat power elsewhere. Furthermore, the tyranny of distance prohibits the logistical feasibility of any construction operation required to support a modern operational tempo.

While local contracting alleviates the preponderance of long and slow-moving supply chains, we cannot safely assume the requisite availability and infrastructure. Firstly, local contractors have to be present in the theater of operations. Recent trends in the number of noncombatants evacuating from combat zones indicate that this is not likely. As of late 2023, approximately 25% of the prewar Ukrainian population has been displaced, with over half of the displaced population seeking refuge in another country. While such displacement is understandable, we can safely assume that the local construction supply industry has seen some of its people leave, especially in the battle-scarred areas where military construction will be most badly needed. Even if the contractors remain, their supporting infrastructure would need to be intact, again far from a reliable assumption.

If the almighty dollar finds one limit when there is nothing available to buy, it runs into yet another when vendors are not willing to sell. In a hypothetical offensive into enemy territory, vendors may be uncooperative or outright hostile. Even if we are able to arrange local purchases of material, there are inherent risks to operational security in doing so. Additionally, coordinating delivery of purchased supplies with a local vendor exposes construction assets to a potential guerrilla threat. Alternative supply methods allow us to preserve security while protecting soldiers and critical equipment.

In discussing the shortfalls of local purchasing for construction material, potential conflicts in the Pacific deserve special mention. Islands with small populations and limited supply chains will have few viable vendors, if any at all. Such a lack of local vendors limits engineers to the few materials that an already-overburdened supply system can deliver, and what materials are available in the surrounding terrain. Thus, the crux of the matter: as military engineers, we must be prepared to extract and make use of locally available resources in order to complete construction missions. Lumber shortages were an acute issue for engineers during the Korean War, but our predecessors in the 62nd Engineer Battalion simply ripped up spur lines from the railroad to salvage the ties for construction. Meanwhile, the 11th Engineer Battalion set up a portable sawmill in 1951 which stayed in operation until well after the war was over. We should educate ourselves from their stories and prepare to emulate their actions.

A locomotive water tower built with repurposed railroad ties by the 62nd Engineer Battalion in Korea. Photo right: Engineer Soldiers operate a makeshift sawmill along the ALCAN Highway, 1942. Photos courtesy of the Center of Military History.

...So How Do We Get What We Need?

Unfortunately, this is not an area of study that lends itself to a metricized evaluation of training. The task could not be adequately defined, the relevant conditions are inherently extremely variable, and no consistent set of evaluation standards could ever be published across the Regiment. The value exists nevertheless. While we may not be able to quantify the results or develop standard planning factors, it is critical that we practice thinking about solutions to these challenges. There are innumerable opportunities available for unit leaders to conduct professional development on this topic, using their local areas as examples. Any planned leaders' reconnaissance of a training site can discuss the materials available in the local area, and any staff ride can take the extra time to explore potential borrow sites. Doing so requires little more than time, commitment, and a creative mind – just as it will in operational execution.

Similarly, creative minds can turn a variety of unconventional materials to good use. On top of their usual purposes, wood and pipes can be employed to create fascine bridges – a military engineering technique practiced for millennia before fading to obscurity in recent decades. Any engineer considering construction in the frozen north must regard snow and ice as possibilities as well as hindrances. In more tropical climates, the experience of the British Fourteenth Army during WW2 is instructive. Required to construct a road along numerous tidal creeks, with no equipment for excavation nor any stone to create a base course, their engineers spaced kilns along the roadway, baked bricks from the clay on site, and laid them on the ground by hand. As their commander, Field Marshal William Slim, described: "A brick road is terribly apt in rain to sink into the earth, but, constantly having fresh bricks relaid, it held, a monument to ingenuity and determination." This was a brute-force solution, devoid of conventional engineering competencies, but adequate to the task at hand.

While much of what we can do does not require any new monetary investment, there are some limited steps that the Regiment can take to acquire some of the tools necessary to meet this challenge. Sampling tools for certain construction materials exist in the Survey and Design sections of EAB battalions, but these are not always fielded and could be distributed more widely. While there is intuitive logic in limiting these to only those who have construction assets available, soils and materials testing tools ultimately serve a reconnaissance function that can shape future operations for follow-on units. The more widely we distribute these tools, the more information available on potential sourcing solutions.

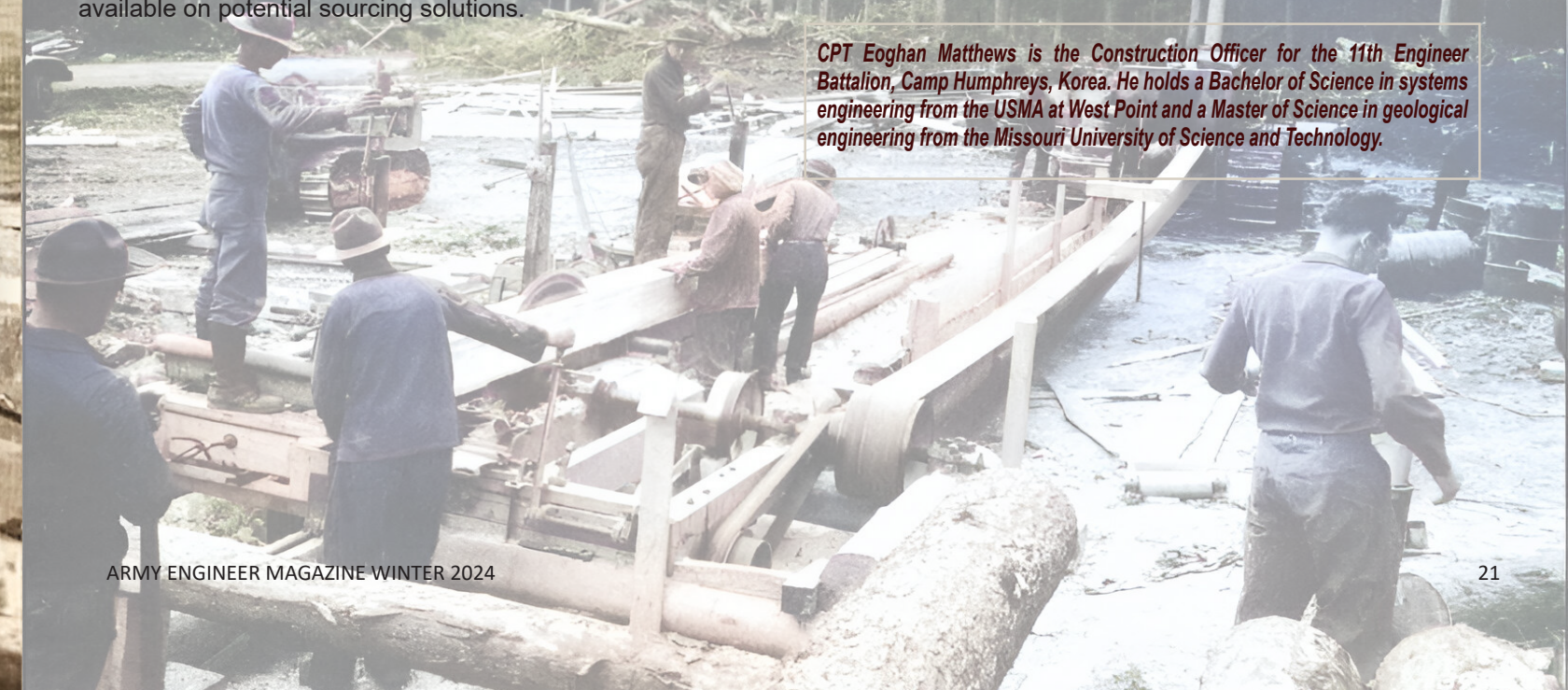
Mindful of the examples set by the 291st and 11th Engineer Battalions, another potential asset would be portable sawmills. Historically organized in their own detachments before being phased out of service, these would be easy to obtain and integrate into vertical platoons. Plenty of variants are available for purchase as commercial-off-the-shelf items, and are relatively cheap. Many come as trailers, and we already have the vehicles needed for towing capacity. The additional training and resource requirements would also be minimal, but the additional capability would be significant.

Within the limitations of our existing professional military educational structure, there are a few opportunities available. Increased education on low-density and specialty assets will pay dividends when the day of execution comes. Our 12G Quarrying Specialists still exist in National Guard Quarry Detachments – and that is the extent of my knowledge on that topic. I am a construction planner in a forward-stationed engineer battalion. In contingency operations it would be my responsibility to enable RSOI and integrate a quarry detachment into construction operations, but I know nothing about their work rates, fuel consumption, equipment requirements, or any other meaningful planning factor. It is true that no active-duty officer will ever find themselves assigned to one, but that does not justify remaining ignorant on the topic.

A further option to explore at the schoolhouse, though grim and situation-dependent, is the seizure, occupation, and use of existing assets and facilities. Doing so would be a last recourse, with potential ramifications among the local population, but we must consider the possibility. Numerous quarries and lumber mills exist throughout the world, and as military engineers we should be prepared to make use of any that we may find in our operational areas. Being ready to do so requires a basic knowledge of quarrying and milling operations. A day in the schoolhouse could easily meet that need, enough that engineer officers have a baseline understanding and some references to fall back on should the time come.

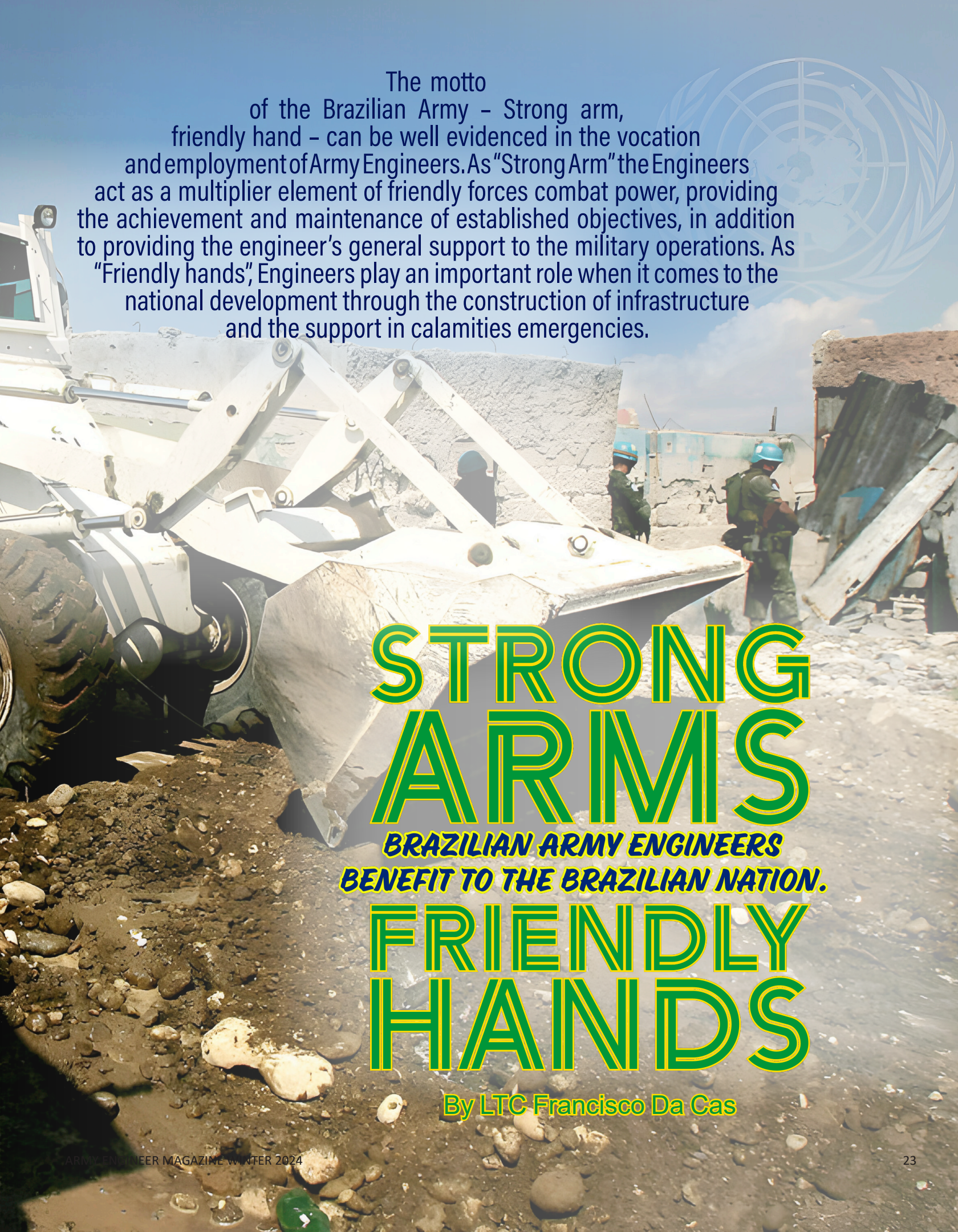
In closing, as we prepare for future conflicts, we would do well to keep in mind the advice that Major General Hugh Casey gave to all military engineers in 1943: "A military engineer must have the ability to improvise. He will have to do his job with what is available on the spot. There is no corner hardware shop to get the supplies, or industrial establishment to turn out the tools that he needs for the job immediately ahead. He must do it with what is on hand." We cannot buy our way out of our problems. We must be prepared to adapt to our operational environments and develop solutions that, while imperfect, accomplish the mission.

CPT Eoghan Matthews is the Construction Officer for the 11th Engineer Battalion, Camp Humphreys, Korea. He holds a Bachelor of Science in systems engineering from the USMA at West Point and a Master of Science in geological engineering from the Missouri University of Science and Technology.



UN Peacekeeping Operation in Haiti - Brazilian UN peacekeepers provide cover in the Cité Soleil neighborhood of Port-au-Prince during an operation to restore order in the area by the United Nations Stabilization Mission in Haiti (MINUSTAH), after three hours of heavy fighting between gangs. Location: Port-au-Prince, Haiti Date: 26 March 2007. Photo courtesy UN.

The motto of the Brazilian Army – Strong arm, friendly hand – can be well evidenced in the vocation and employment of Army Engineers. As "Strong Arm" the Engineers act as a multiplier element of friendly forces combat power, providing the achievement and maintenance of established objectives, in addition to providing the engineer's general support to the military operations. As "Friendly hands", Engineers play an important role when it comes to the national development through the construction of infrastructure and the support in calamities emergencies.



STRONG ARMS FRIENDLY HANDS

BRAZILIAN ARMY ENGINEERS BENEFIT TO THE BRAZILIAN NATION.

By LTC Francisco Da Cas

The origins of the Brazilian Army Engineers dates to the period when Brazil was still a colony of Portugal, during the construction of fortifications at strategic points of Brazilian soil to protect them against foreign invasions. In 1792, in Rio de Janeiro, the Royal Academy of Artillery, Fortification and Design was founded, the precursor of engineering education in the Americas. After the arrival of the Portuguese Royal Crown to Brazil, in 1808, the Royal Corps of Engineers, embryo of Brazilian Army Engineers, was incepted in Brazil. After the Brazilian Independence, in 1822, that organization was maintained. Only in 1908, Engineer was established as a distinct branch.

During the Paraguayan War, a large-scale conflict that opposed Brazil, Argentina, and Uruguay against Paraguay, between 1864-1870, the Brazilian Engineers played a prominent role in supporting the troops, constructing trenches and campaign roads, and supporting wet gap crossings. Highlight the construction of the “Chaco” road, a way through a challenging transposing swamp area that allowed the outflanking of Paraguayan positions, resulting a surprise decisive conquest.

In World War II, under U.S. 5th Army, leaded by General Mark Clark, Brazilian Engineers were represented by the 9th Engineer Battalion. This battalion was the first Brazilian troop to face the enemy in 1944, during the construction of a Bailey bridge that would open the way to the North of the Italian peninsula. Engineers took part in the conquest of important key terrain in the Gothic line, supporting the troop mobility with bridging, clearing minefields, repairing roads, providing topographical maps and constructing field fortifications, which enable the surrender of the entire 148th German Infantry Division.

More recently, the Brazilian Engineers was highlighted in United Nations peacekeeping operations in Angola (1990s) and in Haiti (between 2004 and 2017), where it brought this strong arm in supporting troops and its friendly hand in the reconstruction of the infrastructure after the colossal earthquake in 2010. Furthermore, under the Organization of American States, Engineers contributed to humanitarian demining in Central and South America.

In terms of “Friendly hands”, Army Engineers have provided great support in the development of the Brazilian national infrastructure. This mission has been accomplished since 1880, when a law established the use of the Corps of Engineers.

In the beginning of the 20th century, Army Engineers built almost 2k miles of telegraphic lines that enabled to connect several Brazilian states, until then with no communication with the capitol. In this endeavor, Marshal Candido Rondon stood

Photos left to right: Concrete paving in the Highway BR-101 in 2010s. / Railway Viaduct number 13, constructed by Army Engineers in 1970s. / São Francisco River transposition in 2010s

Photos left to right: Candido Rondon and former U.S. President Theodore Roosevelt during the expedition that discovered the Roosevelt River in 1913./ Army Engineers constructing a railway in the South Trunk in 1960s. / Rondon Commission in an Indian tribe at Amazon in 1910s./

out. As an Engineer Colonel, he commanded the "Rondon Commission", with, in addition to taking telegraphic wires to the Amazon, carried out cartographic mapping and conducted several scientific studies in the fields of indigenous ethnology, geography, fauna and flora of extensive territory. It is noteworthy that the international recognition of this work led the former president of U.S. Theodore Roosevelt to invite him to participate in an expedition deep in the amazon jungle between 1913-1914, and which resulted in the discovery of a river, named after him.

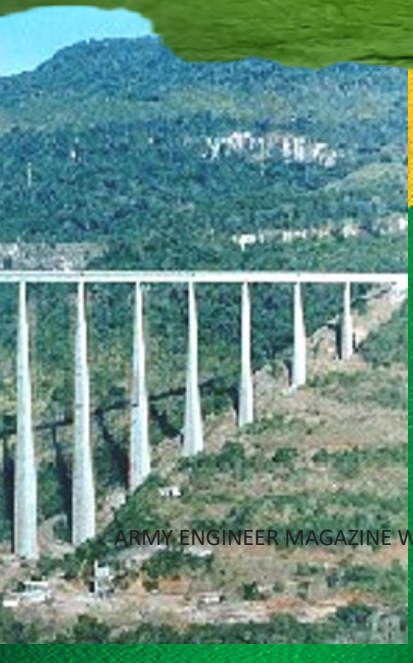
At the same time, Engineers was also tasked with expanding the national infrastructure. Initially, the Engineer battalions worked in the construction of Southern Trunk, which warranted the railway connection with the southern states along with the expansion of the road network. In this mission several roads and railways were built, including imposing tunnels and bridges, such as viaduct 13, which is 740 feet high.

In 1955, the 1st Engineer Group was incepted in the Northeast region, which was settled with four Construction Engineer Battalions. Among the accomplishments of such Units are the construction of military bases, roads, houses, schools, hospitals, dams and wells, which help to alleviate the precarious living conditions of the population that has historically suffered from scourge of drought. Since then, it has contributed to infrastructure works in this region, such as the transposition of the São Francisco River and the paving with rigid concrete slabs of the BR-101 highway.

Thereafter, focusing in the Northern Brazil, in the 1970s, the 2nd Engineer Group was created in the hearth of the Amazon, also settled with four Battalions. Engineers overcame the challenges of this inhospitable region, providing infrastructure to the most distant corners of the Brazilian jungle. New facilities were built for jungle and frontier units, airstrips, ports, roads, and wells. Recently, highlights are to be made to the completion of the paving of BR-163 and the ongoing construction of a concrete landing strip for heavy airplanes on the border with Peru.

In this more than a century of activities, Army Engineers left a large collection of works for Brazilian infrastructure. It includes the construction of 9k miles of roads, 2.5k miles of railways, 40 miles of bridges and viaducts, 30 miles of tunnels, 205 dams, 2k wells, 61 military units, 10k homes, and 53 airports and airstrips.

And why does Army Engineers execute these works? It is known that during combat operations the Engineers carries out several missions related to field infrastructure, such as roads, airfields, and facilities. So, it can be inferred that Engineers need



to be fully trained in these tasks during peace time. In this way, employing them during the preparation in the implementation of public works serves to two interests.

Firstly, when it comes to the concerns of Brazil, it counts on an organization capable of planning and acting in infrastructure throughout the territory, including in remote and difficult-to-access locations, as well as maintaining Engineers Units capable of meeting the needs of supporting civil defense actions and peacekeeping operations under the auspices of international organizations. The second interest refers to the Army itself, by allowing the effective training of its Engineers, the renewal of the fleet of equipment and trucks, the technical training of human resources and the production and management of scientific-technological knowledge applied to general engineering and environment. Moreover, Engineer Units have contributed to the specialization of the national workforce, such as construction machine operators, bricklayers, topographers, and technological control laboratory assistants.

The Brazilian Engineers proudly wear a unique piece of uniform that represents them, the tropical hat. It was adopted to speak for audacity, selflessness, detachment, and stoicism, like the “Bandeirantes” from the 17th to 19th centuries, who undertook exploratory expeditions to the Western Brazil, diving deep into the unknown interior of the South American continent, where they established several settlements, which allowed the expansion of the Brazilian territory. In the shadow of this hat, cities were born, hopes were sown, wealth was cultivated, inhospitable areas were explored and the paths to Brazil’s progress where shortened. The history of Brazil was modified and enhanced by our Engineers.

Castelo Engineer

PHOTOS TOP LEFT TO RIGHT

Brazilian Army Engineers conducting a gap crossing during a field exercise.

Cement work by troops.

Demining in Central America (supporting the Organization of American States) 2000s.

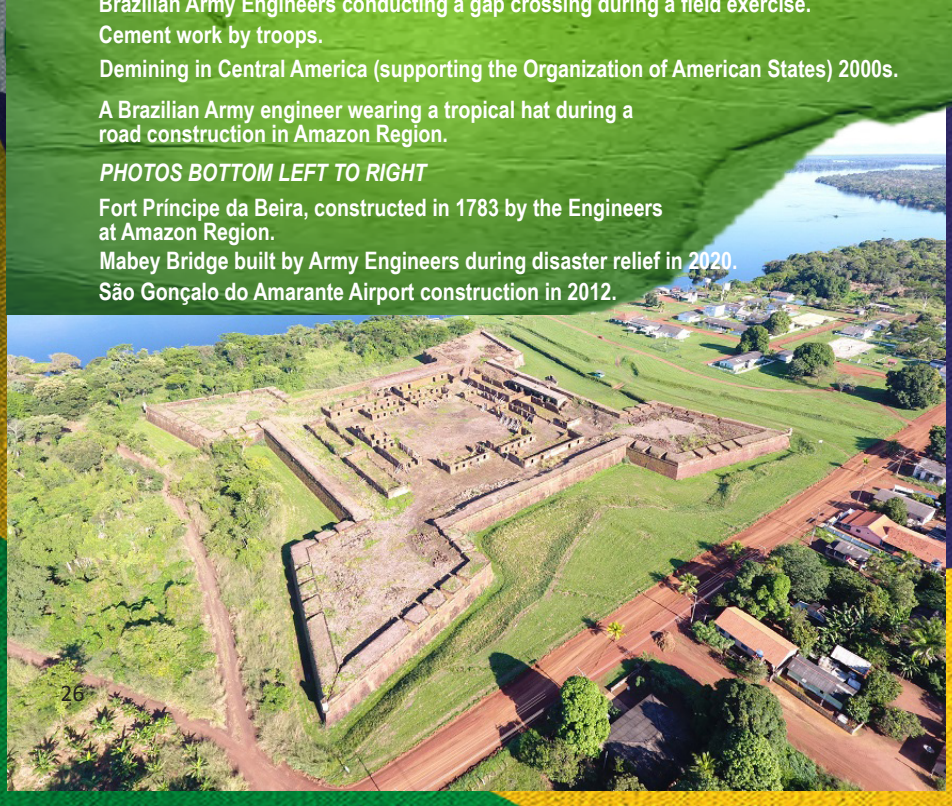
A Brazilian Army engineer wearing a tropical hat during a road construction in Amazon Region.

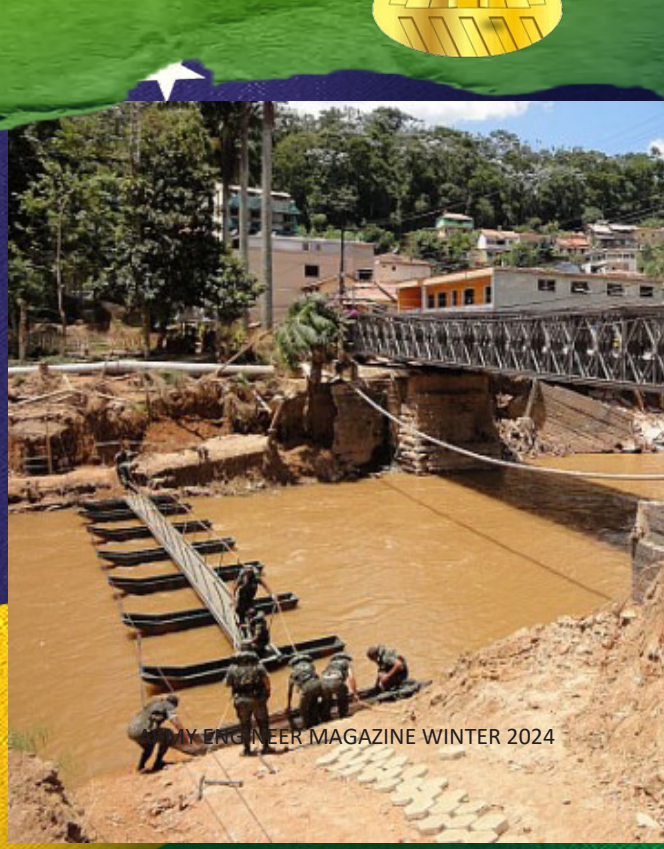
PHOTOS BOTTOM LEFT TO RIGHT

Fort Príncipe da Beira, constructed in 1783 by the Engineers at Amazon Region.

Mabey Bridge built by Army Engineers during disaster relief in 2020.

São Gonçalo do Amarante Airport construction in 2012.



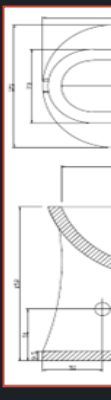


Finally, Engineers, from now and then, whether in peace or war, bring in the materialization of their work, the feeling of fulfilled duty and certainty that "não viveram em vão" (they didn't live in vain) (Engineers motto). Following the leader's command, "Ao braço! Firme!" (Lay! Ho! Heave!) and "Avante remar!" (Row forward!), the Brazilian Army Engineers, united and cohere, continue to face further challenges.

LTC Francisco Da Cas is the Brazilian Liaison Officer in MSCoE, at Fort Leonard Wood, MO. He graduated from Brazilian Army Military Academy in 2001 as a Combat Engineer. He holds a master's degree in military science. LTC Da Cas is a graduated of U.S. Army ECCC in 2013 and of Brazilian Army Command and General Staff College in 2019. He served as Construction Operations Officer in the 2nd Engineer Group, in the Amazon Region. All photos are courtesy of the Brazilian Army.

Cast Iron FOUNDRY

THE OFFICE OF THE PROGRAM MANAGER
SAUDI ARABIAN NATIONAL GUARD



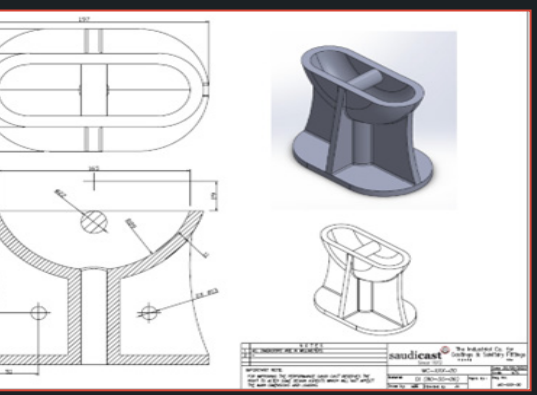
By MAJ Aaron Masson

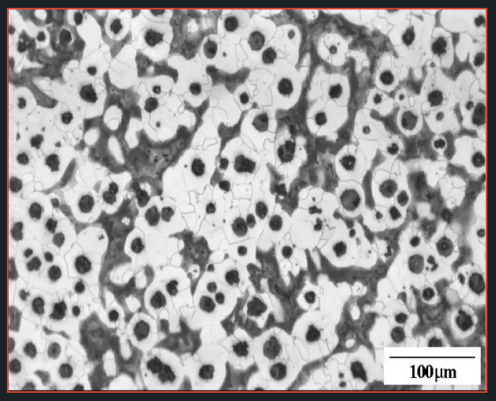
The Office of the Program Manager, Saudi Arabian National Guard (OPM-SANG) is a program that has been around for over 50 years. The U.S. Army and The Kingdom of Saudi Arabia (KSA) have a long history of friendship and security assistance, stretching back to President Franklin Roosevelt and the establishment of the modern Kingdom. OPM-SANG does many things from Aviation support, Logistics, and Light Armored Vehicles support (LAV) and Engineering and Construction support as part of our shared agreements.

Within OPN-SANG is the Engineering and Construction division headed by MAJ Adam C. Laurich. This section is responsible for tens of millions of dollars of active engineering and construction contracts to better help the Ministry of the National Guard (MNG) be able to train and equip its Soldiers. These projects include but are not limited to improving runways for the MNG version of Fort Novosel at Dirab Airbase to building 12 logistics warehouses in the province of Dammam for the eastern MNG divisions. One project was very interesting regarding the Engineer Corps as it required the engineer cell at OPM- SANG to visit a local cast iron foundry where some components for one of the projects are to be sand cast out of ductile gray iron.

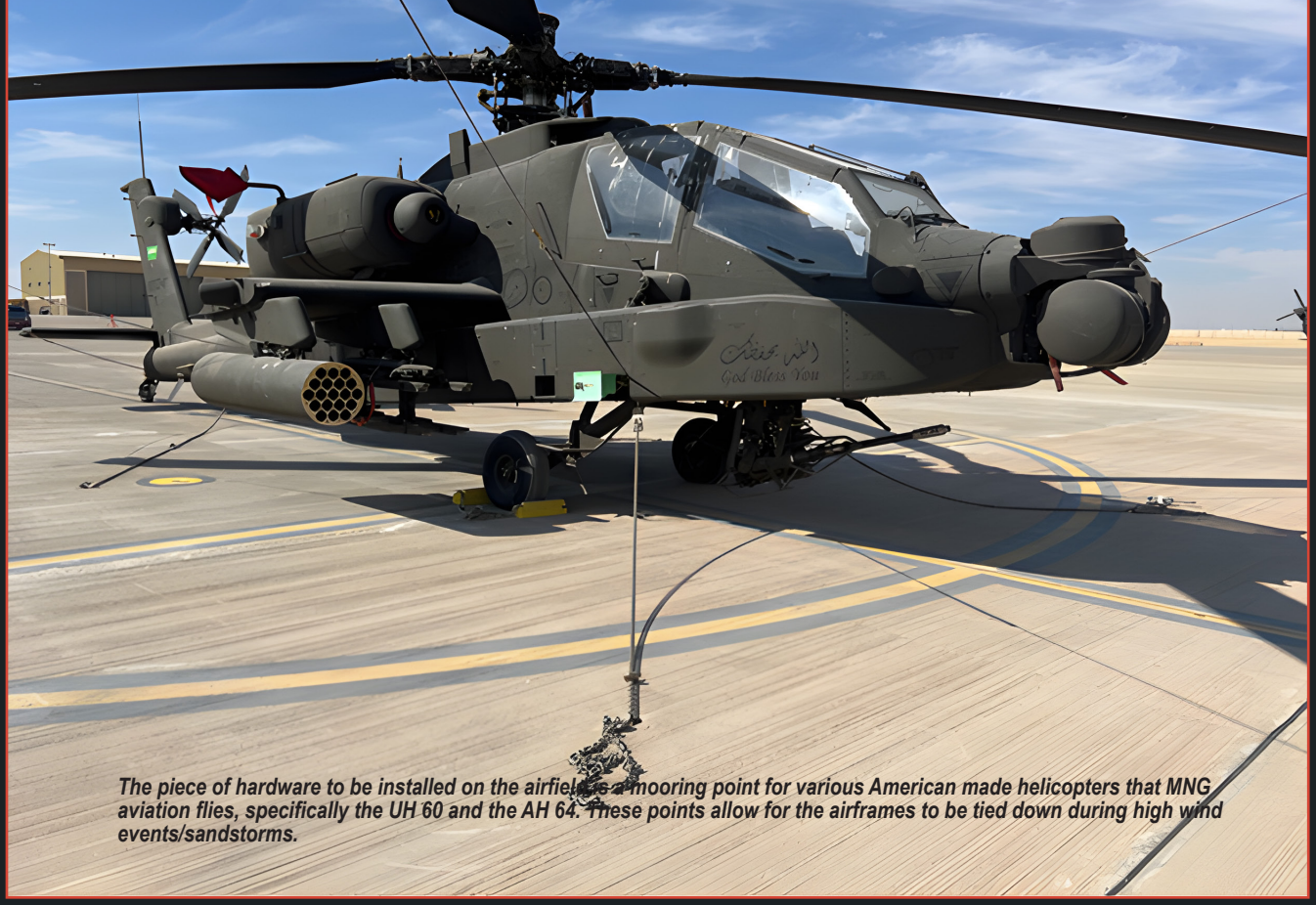
The nuances of the cast iron process were discussed by MAJ Laurich and two of his engineer staff during the shop floor visit as well as spending time in the gage lab and the Coordinate Measurement Machine (CMM) room. Dialogue continued about the sand casting process, metallurgy lab processes, pattern room operation, proper sampling sizes, and other QA/QC characteristics of casting molten metal. For those who have no idea about the cast iron process, imagine baking a cake, all the ingredients must be added at the right time, in the right amounts, it must be in the oven for the right amount of time, at the proper temperature, and taken out of the oven at the right time, or the cake will not be a cake. The same example can be used for pouring cast iron. The exact chemical composition must be checked when the melt is happening inside the pot, too much lead or silica or manganese, and the “iron” will not be iron. It will instead be something that will not meet the specifications of the drawing as it will fracture, bend, too soft or too brittle or generally not be a viable part.

After the right mix of iron, silica, carbon, manganese, molybdenum etc has been verified to be correct, and the proper pouring temperature has been verified, the pot will then go to where the sand cast moldings have been prepared so the liquid





Upper left photo: Iron is poured into the cup hole for the sand mold to make a part. Upper right photo: Calcium carbide is added to the pot to suppress graphite flake formation. Left: Drawing of the cast iron part. Middle: Mooring eye in the ground. Right: Proper microstructure is small black circles graphite nodules after being locked into place shows results of a correct mix of elements during the melt, proper temperature during the pour, and the proper cooling process.



The piece of hardware to be installed on the airfield is a mooring point for various American made helicopters that MNG aviation flies, specifically the UH 60 and the AH 64. These points allow for the airframes to be tied down during high wind events/sandstorms.

iron can be poured out into the sand castings. Time is of the essence in the pour as the temperature of the iron will dictate microstructure and the quality of the actual piece being poured. As iron melts, the microstructure of the material is in a state of flux. Cool it down too fast and the microstructure of the material will be wrong. Pour it too cold, and it will be wrong, cool it off unevenly and it will be wrong and so on. Once the molds have been filled with molten iron, the castings are set aside to cool off at the rate needed depending on the size and shape of the piece. As all cakes are not the same, all cast iron is not the same.

The most important factor for correct microstructure, is the temperature of the iron when pouring. At the end of the pour of a pot of iron, a sample will be taken to check microstructure of the material. It is pulled from the end of the pour, and if it is good while it is cooler, then the previous hotter pours will be acceptable. Too cool is worse than too hot when it comes to microstructure of the iron. Typically, cast iron will begin to melt about 2200 F (1204 C). It is this phase transformation from hot to cold in the iron that is the key difference between making a good part and one that will cause damage to people and property.

For the helicopter mooring points, the U.S. Army calls out for Nodular cast iron, also known as ductile cast iron which has very small round balls (nodules) of graphite locked inside the iron microstructure. When viewed at about 100x magnification or so, you can literally see what is going on inside the iron. Overall, the site visit was a resounding success, and the OPM-SANG EN team is highly confident that our partner MNG members will be getting a reliable, safe, and cost-effective part as cast from a Saudi vendor. Our saying here at OPM-SANG: *Strength through Cooperation.*

MAJ Aaron Masson is the Director of Projects for OPM SANG at Riyadh, KSA. He handles all engineering and construction operations in the Kingdom, Current and Future. This is his 3rd deployment to CENTCOM in uniform service: X1 Kuwait, X1 Iraq, and now X1 KSA. MAJ Masson has had more than 19 years between National Guard and Reserve as a former FA, now EN which includes ten years as EN for USAR. MAJ Masson learned about metal forming and metallurgy during the 15 years at Chrysler powertrain outside of Detroit. His current civilian job is for the U.S. Department of State, Facility Management, where his last duty station was Pakistan.

36th Engineer Brigade supports an assault crossing of infantry forces the morning of November 3rd, 2023. Photo by: MAJ Reyn Mossman, Mission Command Training Program. 43rd MRBC conducts rafting operations of an M1A2SEPv3 during exercise Remagen Ready 24-01. Photo courtesy of the 36th Engineer Brigade.

THE RUGGED BRIGADE OPERATES AS A DIVISIONAL ENGINEER BRIGADE

By MAJ Michael Caddigan, MAJ Emerson Cole & MSG Aida Cruz

In November 2023, the 36th Engineer Brigade supported the 1st Cavalry Division during a Combined Arms Gap Crossing Operation as part of an exercise series named "Remagen Ready." Remagen Ready is a multi-echelon blended training exercise that enables live and constructive large-scale combat operations (LSCO). As a part of the exercise, the Rugged Brigade supported the 1st Cavalry Division during one of the most complex operations the Army conducts, a combined arms wet gap crossing. In conducting successful gap crossing operations with maneuver units, it is imperative to success that engineer units are integrated early, engineer expertise is brought to bear, and flexibility is built into the plan.

During the initial planning of the operation and through the military decision-making process (MDMP), the Rugged Brigade focused on integration and synchronization of efforts at echelon. Although the execution of the Gap Crossing Operation occurred in November 2023, integration occurred months in advance. During the summer, the Rugged Brigade provided a leader professional development (LPD) class to the division staff on combined arms gap crossing operations during 1st Cavalry Division's academics; roughly three months prior to the execution of Remagen Ready 24-01. While this class did not make the entire staff experts on gap crossing, it provided baseline knowledge of the capabilities of the Multi-Role Bridge Company (MRBC), the necessary input that each staff section needs to bring to MDMP, and most importantly, the critical fighting products to enable synchronization of a complex operation.

As the Brigade supported the 1st Cavalry Division planning, the critical fighting product we developed was the EXCHECK. This provided insight into how the division would sequence each unit through the Crossing Area and how each echelon would track the crossing. The military police (MP) element, task-organized under the Brigade, used the EXCHECK to validate each company traveling through the Crossing Area was moving in accordance with the checklist. Additionally, this provided insight to the Brigade and Division leaders to track if the crossing was ahead or behind schedule. By integrating Rugged Engineer Planners into 1st Cavalry Division's planning, we ensured the gap crossing was synchronized and successful.

As the team began to prepare for the operation, we knew the success of the operation hinged on bringing our engineer expertise to bear to support the 1st Cavalry Division. One of the most important pieces of the plan was the intelligence input, specifically the weather and terrain assessment of the slip sites. During the summer of 2023, Fort Cavazos, TX experienced an unprecedented drought causing the water level of crossing sites

to drop 30 feet lower than average. As a result, several planned crossing sites were no longer feasible. While this introduced friction into the planning, it established the necessity for the Rugged Brigade to integrate Engineer Reconnaissance Teams into the crossing forces to confirm or deny viable crossing sites based on our initial reconnaissance.

As a part of the train up for this exercise, the Rugged Brigade focused on deliberate reconnaissance to identify viable crossing sites. We used radars that were part of the Bridge Erection Boats to identify sandbars and other obstacles that were not normally present to map out the path required for rafting operations. Additionally, we received a dive detachment from the 20th Engineer Brigade to support mapping the underwater terrain. The Noncommissioned Officers and the technical experts in the Bridging and Diving communities played critical roles in the success of the operation.

To enable flexibility in execution, all aspects of the plan must be rehearsed thoroughly at echelon. The Rugged Bridge conducted a combined arms rehearsal with our engineer enablers and military police assets to discuss the six phases of the gap-crossing operation. We knew that controlling traffic to ensure the Division could efficiently move through the Crossing Area was critical to the success of the overall operation. The Brigade also hosted a Tactical Exercise Without Troops (TEWT) which allowed company command team leaders to traverse through each Staging Area, Holding Area, Call Forward Area, the Engineer Regulating Point, and eventually boarded a raft to cross the gap. This paid huge dividends to the Division overall because it gave each leader a personal perspective of the scheme of maneuver in the crossing area. It also was imperative for Brigade and Division level leaders to understand how the command and control of forces in the Crossing Area would be executed.

Even with early integration, engineer expertise and flexibility in all facets of the gap-crossing operation, it is inevitable that some measure of friction will be introduced. During the TEWT and subsequent rehearsals in the following days, Central Texas received roughly ten inches of rain, which raised the water level by eight feet. While it may not sound like much, this completely changed the Division's scheme of maneuver, and two additional crossing sites were now feasible to emplace full enclosure bridges. However, with all the rain, slip site maintenance became imperative to ensure crossing operations could occur. Due to the amount of rain, the slips required 450 Tons of aggregate to repair and then maintain once traffic started crossing. The 68th Engineer Construction Company, in concert with the Technical Headquarters Section (THS), developed and executed the plan to ensure Remagen Ready could be a success.

The Gap Crossing Training Center at Fort Cavazos, Texas will continue to support the Remagen Ready series. The 36th Engineer Brigade learned plenty of lessons during Remagen Ready 24-01. Most important was that in conducting successful gap crossing operations with maneuver units, it is imperative engineer units must be integrated early, engineer expertise is brought to bear, and flexibility is built into the plan.

MAJ Mike Caddigan currently serves as the Brigade Plans Chief for the 36th Engineer Brigade at Fort Cavazos, TX and served in this position during Remagen Ready 24-01. MAJ Caddigan has a Master's Degree in Engineering Management from Missouri University of Science and Technology and is a graduate of the United States Military Academy at West Point. He is also a graduate of the U.S. Army Command and General Staff College.

MAJ Emerson Cole is currently the Brigade Chief of Operations for the 36th Engineer Brigade at Fort Cavazos, TX and served in this position during Remagen Ready 24-01. He is an Omaha, Nebraska native and holds a Masters of Business Administration from the University of Nebraska and is a graduate of the U.S. Army Command and General Staff College.

MSG Aida Cruz currently serves as the Plans SGM in the 36th Engineer Brigade at Fort Cavazos, TX and served as the Plans Sergeant Major during Remagen Ready. She previously served as a First Sergeant in 74th Multi-Role Bridge Company and HHC, 62nd Engineer Battalion. She is a graduate of the Master's Leader Course and is currently pursuing her degree in Business Admiration at National American University.

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RR 24-01 WGX Sites Remediation Plan

BLUF: 36th EN BDE conducted site improvement and deliberate slip remediation consisting of slip repair and placing RIP-RAP as needed. 20th Engineer Battalion opened and closed slips based on conditions and traffic.

Unit	25 Oct	26 Oct	27 Oct	30 Oct	31 Oct	01 Nov	02 Nov	03 Nov	04 Nov
43rd MRBC				SPT PLT improves CS 7 and CS 4			CS 7 Slip Site improvement as needed		
74th MRBC			SPT PLT improves CS 9	SPT PLT improves CS 9 with 1x D7 Dozer, 2x IHMEE			CS 9 Slip Site improvement as needed		
68th ECC	Aggregate staged IVO CS 3, 4, 7, & 9			Aggregate staged IVO CSs 3, 4, 7, fanside; 1x Dozer ISO CS 9 improvement			Route remediation and Slip Sites provement as needed at CSs 7 and 9		
59th CEC-A				JAB at LWC 27					

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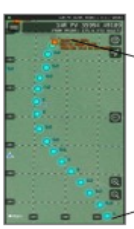
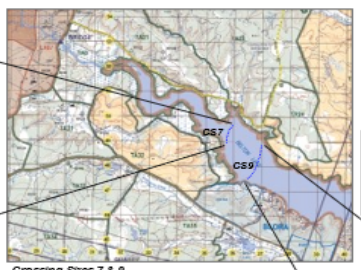
Rafting Operations at Crossing Sites 7 & 9

BLUF: CS7 & 9 are capable of rafting M1 SEPv3 and below traffic.

43d recorded depths across Belton Lake IVO Crossing Site 7





Crossing Sites 7 & 9

43d MRBC & 59th CEC-A rafting an M243 at Crossing Site 9 on 11OCT23

43d MRBC launching a BEB at Crossing Site 9

Crossing Sites 7 & 9 as of Wednesday 11OCT23 –

- Water depths crossing Belton Lake IVO Crossing Site 7 range from 5 to 9ft.
- Water depths IVO Crossing Site 9 range from 9 to 11ft.
- 43d MRBC constructed a 7 Float (2x Ramp w/ 5x Interior Bay) Raft.
- 43d and 59th CEC-A successfully mounted and rafted an M2A3 across Crossing Site 9.
- Landing rafts at the far -side of Crossing Site 7 will require slip site improvement and consistent maintenance due to muddy conditions at the slip site. No issues with launching from the near-side.
- Launching BEBs and Bays is difficult but feasible at the near -side of Crossing Site 9 based on gradual slope / mud IVO the proposed slip site. Landing at the far -side slip is rocky and may damage bays, but again feasible.

43d recorded depths across Belton Lake IVO Crossing Site 9

As of: 21 NOV 2023

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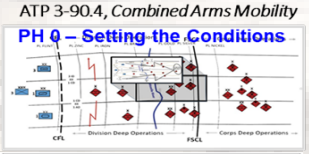
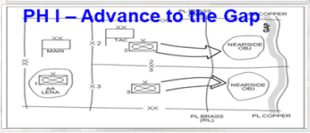
POC: MAJ Mike Caddigan, MAJ Ben Cox (36EN)

Current Crossing Doctrine
ATP 3-90.4, *Combined Arms Mobility*

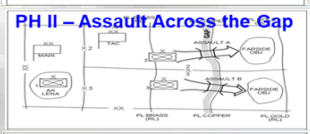
PH 0 – Setting the Conditions



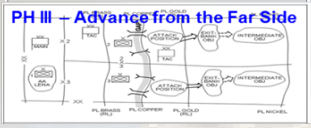
PH I – Advance to the Gap



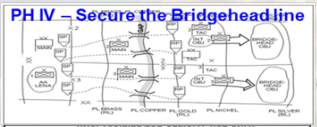
PH II – Assault Across the Gap



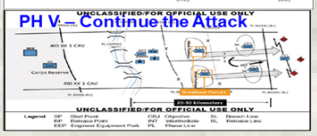
PH III – Advance from the Far Side



PH IV – Secure the Bridgehead line



PH V – Continue the Attack



Considerations for Crossing in an MDO Environment

Setting the Conditions

This is a continuous operation that extends across all the Phases of the operation.

Control the Crossing Area

This consideration views the advance and the assault across the gap as a continuous maneuver operation. Shaping effects must be in place to allow the maneuver elements to maintain their dispersion and mobility to enhance their protection. Task Organizations should distribute crossing resources into the maneuver scheme to reduce call forward timings. To provide a more in-stride crossing as opposed to a deliberate crossing. Infiltrate forces across a dispersed crossing sites to increase survivability. Use shaping effects to generate mass and limit the enemy's response to targeting and interdicting the crossings.

Secure the Crossing Area

This consideration is focused on the onward movement from the crossing site. It projects grounds forces to secure key terrain and extend observation and sensors in support of continued maneuver operations. An effect of these operations is that they set the conditions to allow for a transition to bridging options that more effectively maintainthe traffic flow in support of continued operations..

Continue Offensive Operations

This consideration is broader than continuing the attack in that although in will be used to control ground, its primary purpose will be as a ground component of the Corps shaping effects and extending those effects to achieve the commander's operational intent.

Photo courtesy of the 36th Engineer Brigade.

Navigating the Frontlines of Innovation: The Role of Engineer Technicians in the Army Corps of Engineers

By Lee Bergfield

In the dynamic landscape of military engineering, the Army Corps of Engineers relies on the expertise of engineer technicians to spearhead cutting-edge projects that blend innovation with strategic functionality. These professionals play a pivotal role in the planning, execution, and maintenance of a diverse array of initiatives, ranging from 3-D printing concrete buildings to the deployment of hybrid power trailers and operational energy systems. We will explore the multifaceted responsibilities and duties undertaken by engineer technicians in the Army.

Corps of Engineers. Planning and Execution of 3-D Printing Concrete Buildings

One of the groundbreaking projects engineer technicians contribute to is the planning and execution of 3-D printing concrete buildings. This revolutionary technology offers unparalleled efficiency and speed in construction, enabling rapid deployment of structures in military operations. Engineer technicians are tasked with overseeing the logistical and operation processes, from initial project planning to the on-site execution, ensuring that the technology is harnessed to its fullest potential.

Building Mobile Hygiene Centers

Engineer technicians play a critical role in enhancing the quality of life for military personnel by participating in the construction of Mobile Hygiene Centers. These portable facilities are designed to provide essential amenities for troops deployed in various locations. The engineer technicians are responsible for the meticulous planning and construction of these centers, ensuring that they meet the highest standards of functionality and hygiene.

Deployment and Support of Hybrid Power Trailers and Operational Energy Systems

In an era where energy efficiency is paramount, engineer technicians take charge of deploying and supporting hybrid power trailers and operational energy systems. These initiatives aim to reduce the military's dependence on traditional energy sources, enhancing sustainability and resilience. Engineer technicians ensure the seamless integration of these systems into military operations, optimizing energy usage and minimizing environmental impact.

Constructing and Data Collection Research of Bifacial Tracking Solar Panels

Harnessing the power of renewable energy is a key focus for the Army Corps of Engineers, and engineer technicians are instrumental in this endeavor. They are actively involved in the construction and data collection research of bifacial tracking solar panels. These advanced solar technologies improve energy capture by utilizing both sides of the solar panels, and engineer technicians play a crucial role in monitoring their performance and optimizing their deployment.

Study of Algae Growth and Environmental Effects

Environmental sustainability is a growing concern, and engineer technicians contribute to the Army Corps of Engineers' commitment to studying algae growth and its environmental effects. This research aims to explore alternative solutions for energy production and environmental management. Engineer technicians collect and analyze data, aiding in the development of strategies that balance military operational needs with ecological responsibility.

Photos top to bottom: Mr. Robert Edwards, CERL Engineer Technician, showing the controller and live video of the J8 Robot in action. // Jonathan Goebel, CERL Mechanical Engineer (standing) and Lee Bergfield, CERL Engineer Technician building the bi-facial tracking solar panels at CERL. // Lee Bergfield showing Doug Jones, CERL Engineer Technician a PDICE on EFOB-L at CERL. // Lee Bergfield, (right) and Robert Edwards, (left) in College Station, TX placing 3-D printed walls for testing at their site after driving them down there on a flat bed trailer. // Lee Bergfield, (left) showing Doug Jones (right) working on a Hybrid Power Trailer.
Photos courtesy of CERL.

Execution of Robotic Engineering

The integration of robotics in military operations is a testament to the Army Corps of Engineers' forward-thinking approach. Engineer technicians are at the forefront of executing robotic engineering projects, from designing autonomous vehicles to developing robotic systems for hazardous tasks. Their expertise ensures the successful implementation of these cutting-edge technologies, enhancing the efficiency and safety of military operations.

Transportation of Equipment for Demonstrations

Engineer technicians are largely responsible for the logistical aspects of projects, including the transportation of equipment for demonstrations. Whether it's showcasing 3-D printed buildings or presenting the capabilities of hybrid power trailers, engineer technicians ensure that all necessary equipment reaches its destination safely and on time. Their meticulous planning and coordination are essential for the success of project demonstrations.

In conclusion, in the Army Corps of Engineers, engineer technicians are the unsung heroes driving innovation on the frontlines. From revolutionizing construction methods with 3-D printing to advancing renewable energy solutions, these professionals play a vital role in shaping the future of military engineering. Their multifaceted responsibilities encompass planning, execution, and support across a spectrum of projects that not only enhance military capabilities but also contribute to environmental sustainability and operational efficiency. The Army Corps of Engineers relies on the expertise of engineer technicians to navigate the complexities of modern engineering, ensuring that the military remains at the forefront of technological advancement.

CERL is an excellent place to work to gain one of a kind experience and professional growth.

Special thanks to my fellow Engineer Technicians Bob Edwards and Doug Jones here at Construction Engineering Research Laboratory (CERL) in Champaign, IL. Your hard work, creative problem solving, and our genuine comradery create a "Can Do" environment where nothing is impossible.

Mr. Lee Bergfield is currently a Facility Manager and Engineering Tech at CERL. Before joining CERL in 2012, he served in the Navy Seabees as a Construction Mechanic with NMCB 25. He has worked on several projects over the years including helping with printing 3-D printed concrete structures, installing and collecting data on bi-facial tracking solar panels, building and tearing down B-huts, modifying and showcasing Hybrid Power trailers, helping transport Robotics equipment and helping with demonstrations, building mobile hygiene centers, and so much more.

The Sandhills Experiment

The 20th Engineer Brigade Sandhills Project Team, in collaboration with TRADOC, FORSCOM, and AFC, embarked on a groundbreaking robotic breaching experimentation. The focal points of this endeavor have been the obstacle efforts at in Fort Liberty mimicking current war fighting and Engineers in the 27th EN BN exploring robotic breaching capabilities. The focus of the experimentation lies in obstacle reconnaissance and breaching capabilities using robotic and remote technology.

Platform Integration and Testing

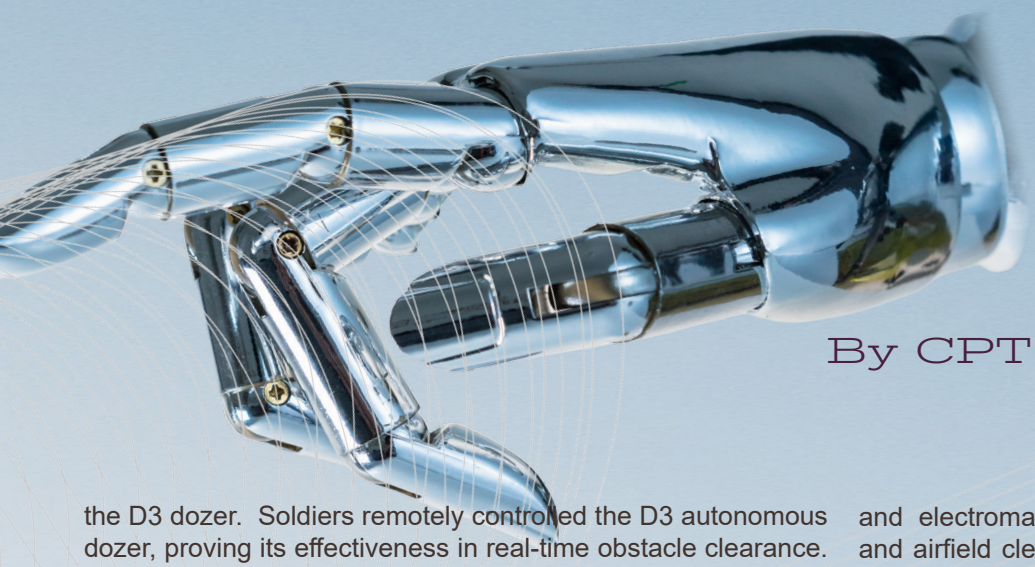
The Sandhills Experiment kicked off with Soldiers establishing connections and building relationships with vendors and service partners. Caterpillar, DEVCOM, ERDC, and RRAI Defense, provided platforms critical to the success of the experiment. The received Expeditionary Modular Autonomous Vehicle (EMAV) equipped with a MICLIC (EMAVLIC) from ERDC underwent modifications to lower its profile. ERDC also supported the experiment with various small Unmanned Aerial Systems (UAS) platforms and subject matter experts.

Breaching Techniques

During the demonstration, Soldiers developed Tactics, Techniques, and Procedures (TTPs) utilizing equipment from several agencies. The D3 autonomous dozer and Skid Steer, EMAVLIC, S-MET, Talon Robots, and a quad-copter were deployed for a comprehensive breaching approach on negotiating mines, C-wire, Dragon's teeth, and an anti-tank ditch. The D3 dozer proved instrumental in clearing the lane up to the mine wire obstacle, ensuring a safe path for the S-MET system. The S-MET system, robotically paired with the Talon system, successfully negotiated the mine wire, demonstrating its effectiveness. The EMAVLIC then played a crucial role in clearing dragon's teeth and cables, showcasing the integration of autonomous platforms in breaching operations. Quad-copters provided real-time overwatch, offering valuable visuals of the battle drills executed by autonomous platforms, enabling informed decision-making.

Special Emphasis on the D3 Dozer

The D3 autonomous dozer played a pivotal role in the Sandhills Experiment, particularly in navigating and negotiating obstacles during breaching operations. Once the initial obstacles, such as the mine wire and dragon's teeth were successfully negotiated, the focus shifted to addressing the method of proofing the lane and defeating the anti-tank ditch. This phase of the operation showcased the versatility and capabilities of



By CPT Idriss Mansaray

the D3 dozer. Soldiers remotely controlled the D3 autonomous dozer, proving its effectiveness in real-time obstacle clearance. The platform allowed for precision in maneuvering, ensuring that the path leading up to the anti-tank ditch was both secure and obstacle- free. The D3's contribution went beyond mere clearance; it actively participated in enhancing the battlefield by filling the anti-tank ditch with dirt. The D3 successfully created a navigable path for subsequent elements of the Sandhills Team, particularly the Expeditionary Modular Autonomous Vehicle (EMAV). The integration of the D3 dozer into the Sandhills Experiment demonstrated its adaptability and effectiveness in dynamic and complex battlefield scenarios. The ability for the D3 to be autonomous, combined with its ability to clear obstacles and modify the terrain, showcased the potential of such autonomous engineering assets in military operations. In the broader context of breaching operations, the D3's role in addressing the anti-tank ditch underscored the importance of seamless coordination and integration of various robotic platforms. The success of this phase of the experiment further validates the military's exploration of cutting-edge technologies to enhance operational capabilities and ensure the safety of personnel on the battlefield. The D3's performance in this scenario stands as a testament to the ongoing evolution of military engineering and its adaptation to modern challenges.

Innovative Technologies

The experimentation included live MICLIC rocket testing on the EMAVLIC and Caterpillar remote operated skid steer platforms using a remote-activated munitions system (RAMS). A special highlight goes to the ERDC Team for introducing the cutting-edge marine telecommuted tracked vehicle, the EMAV, with remarkable payload and towing capacities. Despite challenges with the RAMS system, the EMAV showcased impressive capabilities during testing firing two successful rockets.

UAS and Sensor Technologies

ERDC's UAS assets, including the Skyraider quad-copter and DefendTex USA coaxial drone, were extensively used. The Skyraider, with modularity and multi-camera capabilities, demonstrated reconnaissance capabilities. The ERDC team also shared insights into sensors such as LIDAR, thermal, and electromagnetic influence, enhancing reconnaissance and airfield clearance systems. The UAS provided mapping products which provided obstacle insights to operators of the platforms previously mentioned.

As the final point, the Sandhills Experiment has been a testament to the collaboration and innovation within the Army. The integration of robotic platforms advanced technologies, and strategic partnerships sets the stage for the future of breaching concepts. The lessons learned from this experimentation will undoubtedly shape the Army's capabilities on the battlefield, ensuring a safer and more effective operation.

Special gratitude is extended to the Engineer Research and Development Center (ERDC) and Combat Capabilities Development Command (DEVCOM) for providing crucial assets such as the EMAV and Small-Multipurpose Equipment Transport (S-MET) for early testing. Additionally,sincere appreciation goes to COL Hinson's team and 3rd ESC (R2E) for facilitating MRZR transfers essential for on-site experimentation. Leaders from TRADOC, AFC, FORSCOM, XVIII Airborne Corps, III Corps, 75th RR, 1st SFC, USASOC, I/II MEFs, 2CR, JRTC, and NTC actively participated in the experiment, contributing to the development of a robotic breaching concept, tactics and technologies.

CPT Idriss Mansaray is the Commander of the 264th Clearance Company, 27th EN Battalion (Airborne), 20th Engineer Brigade at Fort Liberty. All photos courtesy of the 20th EN BDE. Photos courtesy of USACE.

Coastal project sheds light on importance of community collaboration at Montauk Point Lighthouse, New York

By JoAnne Castagna, Ed.D.

In the 1970's, if you took a helicopter ride from New York City to the Montauk Point Lighthouse, that sits on the eastern tip of Long Island, NY, you could have spotted a woman in her 60's crawling along the 65-foot cliff under the beacon, packing and shaping earth with her bare hands and her small garden hoe. Her name was Mrs. Giorgina Reid.

What possessed this textile designer from New York City to do this? She witnessed firsthand the devastating effects of erosion on something else she loved - her dream retirement home. A nor'easter carried away 18-feet of shoreline from her Long Island cottage into the sea. She was able to save her property by developing a terracing erosion control method and now she was using her technique to save the lighthouse.

Mrs. Giorgina Reid at work.

The Montauk Point Lighthouse is located in Montauk Point, a hamlet in the Town of East Hampton, NY, on the eastern tip of Long Island, a peninsula that stretches out into the Atlantic Ocean. The 111-foot-tall octagonal beacon sits on Turtle Hill that has cliffs that cascade into the ocean on the east and south sides of the structure. The lighthouse is white with a broad red ban sitting across its middle like a big belt, holding up its pants in the strong winds that come off the ocean. The lighthouse and its cliffs have weathered the elements since 1796 when it was built at the authorization of President George Washington. Its purpose was and still is to guide ships along the south shore of Long Island into the New York Harbor, using its 290,000-candle power light that flashes every 5 seconds. Because the lighthouse sticks out into the ocean, its cliffs are continually battered by wind, waves, and storms, causing extreme eroding over the years. When the lighthouse was constructed, it was 300 feet from the edge of the cliffs. More recently, due to erosion, it was less than 100 feet, putting the lighthouse at risk.

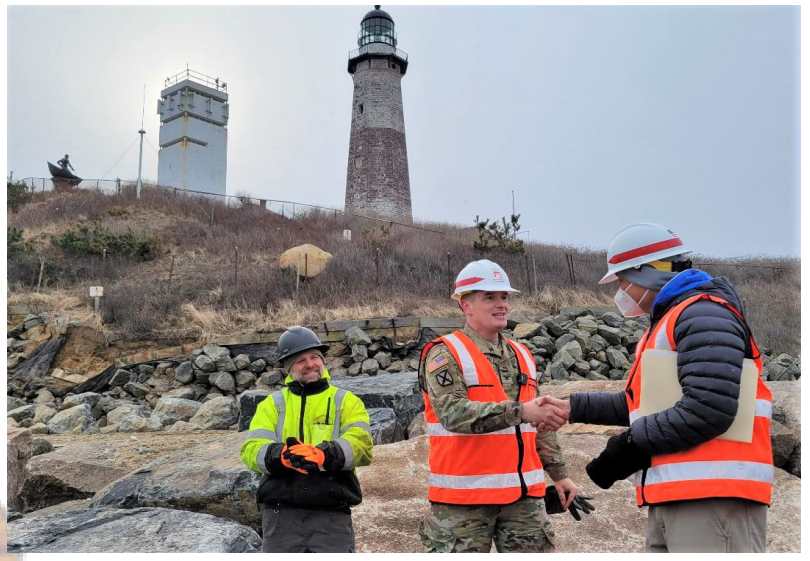
The Coast Guard in 1969, announced that the lighthouse would be replaced with an automated beacon by 1972 and that the old lighthouse tower would be preserved as an historic monument. There was so much community support to save the lighthouse that the Coast Guard halted its plans and instead looked into ways to stop the erosion. Mrs. Reid thought she could help them with her own terracing method. The technique was born when she was cleaning up debris from her damaged property that was located 50-feet from cliffs that overlooked the Long Island Sound in Rocky Point, Long Island. She noticed pieces of lumber and reeds along the beach with sand piled up behind them. The rubble gave her a simple but effective idea for controlling cliff erosion.

Mrs. Reid gathered the debris and began to work on the cliff below her property. She terraced it by stuffing reeds behind the lumber and packing them tightly with sand. Support stakes held the lumber in place, and the sand allowed growth of vegetation. The reeds prevented the sand from leaching out and the hollow stems provided organic matter and water retention for plantings. The cliff was stabilized so that land was not carried away as heavy rains washed down each terrace level. When she completed her home's embankment, another major nor'easter blew in and the cliff remained intact. She was so impressed that she patented her "Reed Trench Terracing" method and wrote a book about it

Mrs. Reid and her volunteers were successful at stabilizing the eastern cliff of Turtle Hill, but the south cliff proved to be challenging because it was almost a vertical slope, making it difficult to terrace. This didn't stop her. She sculpted the cliff face by hand in order to create a proper angle for terracing. In the end the work was successful at controlling runoff and stabilizing the soil, even though Mrs. Reid broke a leg in the process. After she retired from this, she was recognized by President Ronald Reagan who presented her with a proclamation and a letter of commendation in 1986. The following year, a museum was established inside the lighthouse by the Montauk Historical Society and a room was dedicated to her.

At the time, Mr. Greg Donohue a local landscaper and self-proclaimed "Hippie" and volunteer, constructed his own sea wall to stabilize the cliffs. He collaborated with the Coast Guard, Montauk Historical Society, and the New York State Office of Parks, Recreation and Historic Preservation, to build the 1,300-foot seawall made from 28,00 tons of stone. He exclaimed, "I'm proud to say that it's still intact. The extra heavy metal stakes that I used to support the cliff 34 years ago, are still there, still functioning and supporting." Mr. Donohue would eventually become the Montauk Point Lighthouse Director of Erosion Control also tried to garner funding that included organizing events like clam bakes, but it wasn't enough. Then members of the Montauk Historical Society heard that the singer, Mr. Paul Simon, who lived not far from the lighthouse was practicing with his band in West Hampton for a Graceland International Tour. Mr. Simon and his band performed and raised $585,000 for the erosion project.

After this, two major storms in 1991 eroded the cliffs further stressing the need for more money and erosion control work. Mr. Donohue said that not long after this a miracle happened. At the time, he landscaped for a man was soon to become New York Senator Daniel Patrick Moynihan's son-



COL Matthew Luzzatto, former commander, USACE New York District with project team during construction.

in-law. When Mr. Moynihan heard about the lighthouse's need for funding, he was able to get the ball rolling to provide funding to USACE to conduct a study of the area.

When the USACE completed its study, it was determined that a rock seawall of about 28,000-tons could protect the lighthouse from erosion, so the Coast Guard engineers in collaboration with the Montauk Historical Society, and Parks Department constructed a 770-feet long seawall with USACE's consultation. The work proved to be successful, and the project was able to withstand several storms. USACE received funding and authority to restore this with the Hurricane Sandy Disaster Relief Appropriations Act of 2013.

This project was performed by the Army Corps in cooperation with the New York State Department of Environmental Conservation, Montauk Historical Society, New York State Office of Parks, Recreation and Historic Preservation, Town of East Hampton, and Army Corps Contractor, H&L Contracting of Hauppauge, NY. Mr. Frank Verga, project manager, USACE New York District on this project for 26 years explained, "The project is designed to shore up the beach front surrounding the historic Montauk Point Lighthouse to protect it from future coastal storms." This work was recently completed and included expanding the stone seawall around the base of Turtle Hill. The wall was nearly doubled in width and breadth, using more than 60,000 tons of granite boulders to broaden the flanks of the wall, cutting Turtle Cove about in half, and forming a new seaward bulge at the face of the point with two flattened "benches" to allow foot traffic to cross the front of the seawall. Mr. Donohue stated, "When the last stone was set, Mr. Frank sent an email to the team saying, 'Everybody we really did a good thing here.'"

A ribbon-cutting ceremony was held to celebrate the completion of the erosion control project and renovation. Mr. Donohue recalled that, "During the ceremony Frank apologized that the project took so long. I thought this was hilarious because the project just had to evolve in its own way, and it did. I told him, 'Frank look, look down at the wall we built.'" Mr. Donohue praised Mrs. Reid who passed away in 2001, "Georgina would be proud of this work. It's been 53 years since she showed up with all of her chutzpah and sassiness and said, 'Get out of my way, boys. I'm here! Okay? I'm going to take over' and she sure did.

She planted a seed and then all these little good things happened. This project turned into an incredible testament to professionalism, to people listening to each other and communicating. Hats off to the U.S. Congress, the State legislature for funding, and all of the engineers and the Army Corps. Today families are visiting this national historic landmark and fisherman are using the wall. It's phenomenal. Absolutely phenomenal."

Dr. JoAnne Castagna is a Public Affairs Specialist and Writer for the USACE, New York District. She can be reached at joanne.castagna@usace.army.mil. Photos courtesy of USACE.

Completed Montauk Point Coastal Resiliency Project.

Eroding cliff The eroded cliffs at the Montauk Point Lighthouse in 1968.

USACE, New York District team that worked on the Montauk Point Coastal Resiliency Project with COL Alexander Young, Commander, USACE, New York District.

New England District Completes Bucks Harbor Waterline

BY ANNMARIE R. HARVIE

Left: GAC tanks area. Middle: A waterline is installed at Bucks Harbor to bring clean drinking water to residents. Right: The contractor digs a trench to run the waterline. Photos courtesy of USACE.

The waterline project at the Bucks Harbor Former Air Force Tracking Station (AFRTS) in Machiasport, ME is complete and bringing clean drinking water to the residents living along Howard Mountain thanks to the USACE, New England District the Downeast Correctional Facility (DCF) and the Maine Department of Environmental Protection (DEP). Contaminants detected in the water made it necessary to construct the waterline. The project was completed under the New England District's Defense Environmental Restoration Program (DERP), Formerly Used Defense Sites (FUDS) program. "The Bucks Harbor site was used between 1954 and 1984 as an AFRTS for protection against hostile aircraft," explained Project Manager Ms. Marie Wojtas, "While the AFRTS was in operation, toxic solvents were reportedly used, including trichloroethene (TCE) and tetrachloroethene (PCE) for maintenance and cleaning operations."

Part of the property is now owned by the state of Maine Department of Corrections and used for a minimum-security prison known as the Downeast Correctional Facility (DCF). The Federal Aviation Administration (FAA) currently owns the remainder of the property. Investigations performed in 1995 by the New England District determined those solvents were disposed of on the ground surface at various locations and consequently found in the groundwater. "As a result of those investigations, point of entry treatment systems (POET) were installed in the homes at residential locations where groundwater was contaminated," continued Ms. Wojtas, "The residential POET systems are essentially filters which use vessels filled with granular activated carbon (GAC) to remove organic contaminants from water."

Between 1995 and 2017, USACE completed the investigation phase of the project. The investigation included removing the underground and above ground storage tanks, soil excavation, installing monitoring wells, sampling monitoring wells and residential wells, installing POET systems for contaminated water supplies, and completing project reports such as the site inspection, the remedial investigation, proposed plan, and decision document.

In May 2017 a project decision document identified the need to provide an alternate water supply to impacted residents. "The alternate water supply was to include the extension of the waterline from the public water system well which is served by the DCF," stated Ms. Wojtas. The District awarded a $170,000 contract to Colby Company LLC for the design and construction of a water supply distribution system extension and treatment system upgrade. CCI Energy and Construction Services received a $1.5 million design and build contract award to upgrade the DCF water supply and to install the waterline extension – to include 5,400 feet of excavation from the DCF to five existing residences, plus the capacity of up to 10 residences, that have contaminated water. "The project included upgrades to the existing public water supply including upgrades to the mechanical and electrical infrastructure, general building repairs, addition of a GAC filtration system, upgrade of existing chlorination system, and modification of the well to a non-confined space condition," expressed Ms. Wojtas.

The design documents for the project were completed in January 2018, but the project hit a roadblock when DCF suddenly closed in February 2018 and the contract was terminated. The Maine Department of Corrections renovated and re-opened the facility and later the District contracted WSP USA Environment and Infrastructure to review the 2018 design documents and update them. The contract also included administrative support and advice during construction.

A $3 million construction contract was awarded to CCI Facility Contractors in 2021 to complete construction of the waterline extension and treatment system upgrades for the DCF public water supply and the work was completed in September 2023. The District and MDOC have a memorandum of agreement regarding the operation and maintenance of agreement regarding the operation and maintenance of the treatment system and the waterline extension. "Groundwater monitoring, which began in 1995, will continue with samples being collected annually," said Wojtas.

DERP/FUDS is a Congressionally directed program (PL 98-212) that provides for an expanded effort in environmental restoration. It emphasizes the identification, investigation and cleanup of hazardous and toxic waste; unexploded ordnance; and unsafe buildings, structures and debris at current and former military facilities. One hundred and eighty-one formerly used defense sites have been identified in Maine. Site and project eligibility investigations at 181 sites are now complete, including 93 where no work was found to be necessary.

The DCF and Ivar McLeod, project manager for the Maine DEP, contributed to the successful creation completion of the project. In addition to Wojtas, other New England District team members who worked on the project include Kathy Miller, project chemist, Dan Folan, project geologist, Grace Greenberg, project risk assessor; Lee Thibodeau, Design Civil engineering section chief; Gary Morin and Heather Sullivan, FUDS program managers; Susanne Grant Devens Resident Office (DRO) Chief, Travis Dancewick and Bill Phelan DRO project engineers.

Ms. AnnMarie Reyes Harvie, USACE, New England District is in charge of the District's Command Information program and the Editor of the District's multi-award winning newsletter, the YANKEE ENGINEER and the District's internal newsletter, WEEKLY BULLETIN, since January 1993.

AEA Sapper and Miner Award of Distinction

2024 AEA Sapper and Miner Award of Distinction (SMAD) Guidance

Timeline. The 2024 Sapper and Miner Award of Distinction process will begin on 1 January 2024. The timeline for this process is:

- 1 January – 31 January 2024 Receive nominations.
- 1 February – 15 February 2024 Review nominations for completeness.
- 16 February – 1 March 2024 AEA Awards Committee votes and ranks candidates.
- 4 March 2024 Recommendations submitted to AEA BoD.
- 11 March 2024 AEA President approves winner.

Award Criteria. The SMAD is considered a lifetime service award (typically defined as 30 years) as a member of the Engineer Regiment, military and civilian, in any component. This year the award will be presented to up to eight highly qualified individuals. The award is targeted at individuals whose contributions were in the military engineering "green suit" portion of the Regiment and contributed significantly to the mission categories of mobility, countermobility, survivability, general engineering, or geospatial Army engineer operations. The individual must have had an extraordinary effect on the growth and mission performance of the entire Engineer Regiment, and not just a sub-element thereof. Since this is an AEA award, the person is expected to have a considerable background with AEA as evidenced by AEA membership history, service at the local chapter or at the national level, participation in AEA events, having been previously awarded a de Fleury medal. The individual's connection with and contributions to the Army Engineer Association are a key discriminator for the SMAD. The person nominated may be living or dead. Nominations must be endorsed by an AEA lifetime member in the grade of COL or higher (active or retired).

Submission Requirements. Anyone may submit an individual for consideration for Sapper and Miner Award of Distinction, but the nomination must be endorsed by an AEA lifetime member in the grade of COL or higher. The nomination form can be downloaded from the AEA website. The submission should be made to the AEA Executive Director or the AEA Operations Officer at Fort Leonard Wood. The submission window for a nomination submission is 1 - 31 January 2024. In addition to the AEA nomination form, a SMAD nomination is expected to have a 1–2-page biography (or curricula vitae) and a 2–4-page narrative that clearly outlines the nominees' accomplishments and explains how the accomplishments contributed to both the Army Engineer mission and to support the Army Engineer Association goals, objectives, and programs. The nomination will clearly state who the recommender is and include their contact information in case additional information is required.

Award. The SMAD awards will be presented during Engineer Week at Fort Leonard in April of 2024. Each awardee will receive an individual plaque. A permanent plaque will be displayed in the Regimental Room with the names of all the award winners.

Contact:
COL(Ret) Jim Rector
Executive Director
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AEA Gold de Fleury Medal

2024 AEA Gold de Fleury Medal Guidance

The 2024 Gold de Fleury Medal selection will begin on 1 January 2024. The Proposed timeline is:

- 1 January – 31 January 2024 Receive nominations
- 1 February – 15 February 2024 Review nominations for completeness
- 16 February – 1 March 2024 AEA Board votes and ranks candidates
- 4 March 2024 Recommendations submitted to AEA President and XD
- 11 March 2024 AEA forwards recommendations to CoE and Cmdt

The Army Engineer Association typically awards two Gold de Fleury medals each year. The first is awarded at Fort Leonard Wood in April. This award is referred to as the "Inside the Regiment" award and is awarded to an individual who has had tremendous impact to the Engineer Regiment. The second is awarded in DC in August. This is referred to as the "Outside the Regiment" and is awarded to an individual who has had tremendous impact at the national level. These awards can be awarded to individuals who are living or deceased. The description of the award and a list of past winners is described on the AEA website at Gold-Defleury-History-15-Nov-2021.edited.pdf (armyengineer.com).

Nominations should include a biography and a narrative (1-3 pages) that covers the nominees background and outlines the impact. The packet must provide the contact info for the nominator in case additional information is needed. Nominations are submitted to the AEA XD who will consolidate and provide them to the Awards Committee COL(Ret) Jim Rowan, COL(Ret) Bobby Nicholson, COL(Ret) Brad Welch.

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