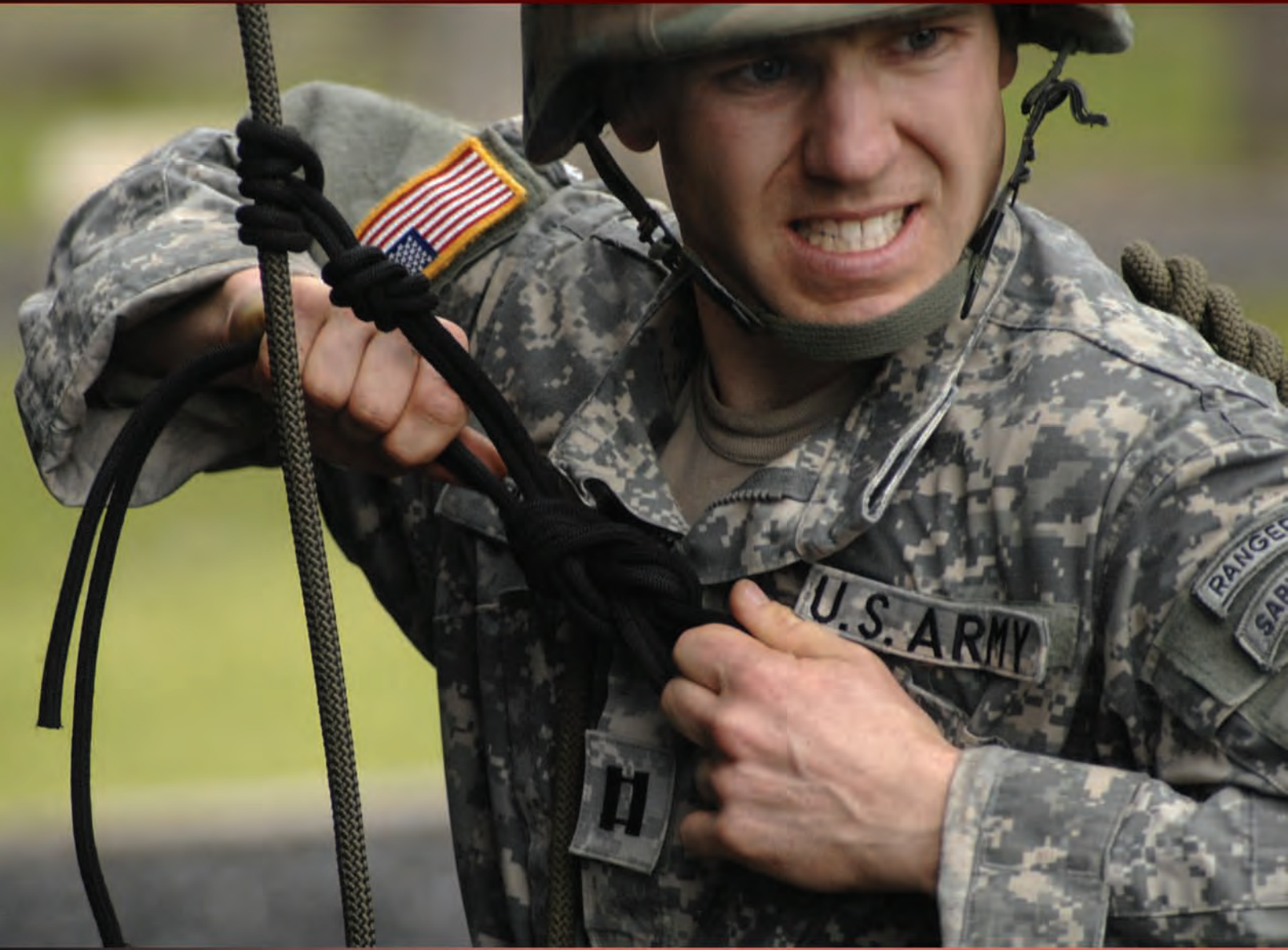


ENGINEER

The Professional Bulletin of Army Engineers



July-September 2007



Army Strong, Engineer Ready!



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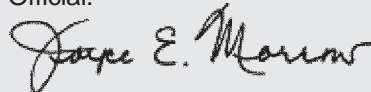
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Clear The Way

By Brigadier General (P) John E. Sterling, Jr.
Commandant, United States Army Engineer School



As we prepare to begin another fiscal year—Army year that is—of continued remarkable, selfless, tireless, and courageous service and sacrifice to the Nation and our Army, summer transitions are nearly complete and our Army Families are back in the routine of another school year, many with their engineer Soldier deployed or deploying to war. Your leaders very much recognize and appreciate that the past five years have been immensely difficult, challenging, and stressful for all members of the engineer team. We are so incredibly blessed and grateful for your service and sacrifice.



Together, we have endured, and will continue to endure, the challenges associated with this persistent War on Terrorism and commitment to achieve great successes in keeping with the ideals, freedoms, and liberties that make our country great.

We have had a great deal of senior leader transition in the Engineer School. We welcome the new Director of DOTLD, COL Jerry Meyer, and his family. COL Dick Hornack has transitioned from the Concept and Development Integration Directorate (CDID) to the Director of the Counter Explosive Hazards Center (CEHC). Other new senior engineer leaders serving on the MANSCEN team include COL Thomas Kula, the Chief of Rapid Transition Division (RTD), and COL Pete Tabacchi, Director of CDID.

I am pleased to announce another great addition to the Fort Leonard Wood community, the Explosive Ordnance Clearing Agent (EOCA) Course. The EOCA team will move from Redstone Arsenal to Fort Leonard Wood in October, and the first course to be taught here is scheduled to begin on 26 November 2007. The EOCA Course, which is transitioning from 6 weeks to 4 weeks, will be located in the new CEHC facility. By moving the course to Fort Leonard Wood, units will realize a cost savings in TDY dollars. Instead of sending Soldiers to two locations, they can now come to only one and receive training on multiple disciplines.

Engineers are able to provide support as required, in accordance with the FRAGO published by MNC-I on 29 June 2007 allowing engineers to blow in place (BIP) confirmed IEDs under certain restrictions. CEHC offers several outstanding training opportunities that prepare Soldiers with current counter explosive hazards techniques and employment of contingency equipment. The Route

Reconnaissance and Clearance Course—Sapper (R2C2-S) and Counter Explosive Hazards Planning (CEH-P) are two key courses offered that instruct on the planning requirements and systems for executing counter explosive hazards operations (with emphasis on counter IEDs). Five courses are offered and are available via ATRRS. I strongly encourage leaders to maximize attendance at these courses aimed at defeating the greatest threat to our forces.

Safety is a matter of utmost importance, and it is personal to all members of our team. As an Army that conducts inherently dangerous operations on behalf of our Nation in training and at war, we continue to injure and lose great members of the team. Sadly, many of the injuries and deaths are preventable. Many occur off duty or are non-battle-related. In reading the many accident reports, the contributing causes of many of the injuries and deaths are quite upsetting and disturbing. It is unbelievable that an alarming percentage of Army Soldiers, Civilians, Families, and their loved ones don't use seatbelts regularly. It is an undisputable fact that seatbelt use is the top preventive measure for injuries and deaths in motor vehicle accidents. I highly encourage everyone to care enough about yourself, your Families, loved ones and friends to accept nothing less than 100% wear of seatbelts at all the times. Your Army and Regiment care! Distracted driving caused principally by cell phone use is another alarming and growing trend. Seek alternatives and demand the same of your friends and Families, to include pulling over to use a cell phone if absolutely necessary or using approved hands-free devices. Lastly, excessive alcohol use remains a problem for our Army, which is exacerbated by those seeking alcohol to alleviate the stress on the force and Family. Excessive alcohol consumption mixed with any activity always results in serious consequences, personally and professionally.

In closing, I'd like to extend my appreciation for the adaptability, flexibility, and perseverance demonstrated by our engineer team to support the War on Terrorism. I ask for your patience and commitment as we ascend from the "trough" in transformation; we will reap the benefits of transformation, most notably over the next two fiscal years.

I appreciate your selfless support and sacrifices to the development of our Soldiers and leaders. Thank you for your service during this challenging and dynamic time in our history.

Lead The Way

By Command Sergeant Major Clinton J. Pearson
United States Army Engineer School



I would like to welcome you back to another great issue of the Engineer Professional Bulletin. This publication helps keep the Regiment informed on current and emerging developments and serves as a tool for enhancing your professional development.

Engineers everywhere are fully engaged in their heavy summer training schedules. Here at Fort Leonard Wood, the drill sergeants and cadre are busy with the annual surge of trainees who migrate with the civilian school cycles. And in our many Reserve and National Guard training areas, engineer units are conducting the annual training that provides their best opportunity of the year to gain collective competence in their mission-essential tasks. At Active Army posts, the normal hustle of training deployments and support is increased with Reserve augmentees, cadets in apprentice troop-leading roles, supporting Reserve unit training, and the surge of personnel turnover.

We continue our efforts to *Transform, Train, and Take Care of the Regiment*. I would like to highlight some changes going on in our Regiment now and some that will take place in the future. Congratulations to all the master sergeants who made the command sergeant major (CSM) list. This is one of the largest selection lists we have had. I know you will continue to display great leadership and to mentor Soldiers as they come up through the ranks. Two units have been added to the Engineer Regiment this past quarter: We activated the 8th Engineer Battalion at Fort Hood and stood up the 31st Engineer Battalion at Fort Leonard Wood.

NCOES: The Engineer Advanced Noncommissioned Officer Course is comprised of three courses: 21B/C Combat Engineer, 21H Construction Engineering Supervisor, and 21N Construction Equipment Supervisor. Commanders and CSMs, I need your assistance to ensure that all Soldiers who are selected for NCOES courses show up. We have had a significant number of no-shows the past two quarters, and we need to eliminate no-shows. NCOES courses are a very important part of our Soldier's promotion and career progression. In FY 2007 the 21 B/C courses graduated 172 students with 33 scheduled no-shows; the 21H course graduated 68 students with



9 scheduled no-shows; and the 21N course graduated 67 students with 7 scheduled no-shows. The projections for FY 2008 show 21 B/C with 183 students, 21H with 37 students and 21N with 30 students.

The Engineer Basic Noncommissioned Officers Course is working to implement the most current and relevant information available into the programs of instruction. This allows a training environment to keep pace with the current operating environment and its ever-evolving demands. Over the past year, we have trained in excess of 433 combat and construction engineers, and 41

construction equipment maintainers. In the future, we expect to maintain the highest levels of mental and physical toughness, which are essential to the continued success of the Regiment.

Modularity: Our Fusion Cell continues to work hard on our Regimental units and strength. Currently, the documented, approved MTOE is a consolidated 151-man engineer company residing in the brigade special troops battalion (BSTB). The current implementation plan is to have the companies convert from two companies in the combined arms battalion (CAB) to a consolidated company in the BSTB, based on the timeline that supports each individual brigade combat team (BCT). We are submitting a force design update (FDU), which has been approved by TRADOC, making two 101-man companies residing in the CABs. In addition to the original 76-man engineer company, the joint assault bridge and assault breaching vehicle will be added. The personnel and equipment numbers haven't been worked out in depth, but the plus-up of personnel and equipment will fill gaps identified as shortfalls in the original heavy brigade combat team (HBCT) engineer companies. The FDU is being initiated and will be inserted in the Total Army Analysis (TAA) 10-15 cycle.

In closing, I am extremely proud of our Regiment's Soldiers for their contributions and positive impact over the past year. I am especially proud of the sappers who are deployed around the world in harm's way. To those who have paid the ultimate sacrifice in the cause of freedom, justice, and the American way of life, neither you nor your families will be forgotten.

God Bless America!

PLAN, BUILD, PROTECT: ASSISTING IRAQ!

By Major Joseph A. Snel

As the Multinational Corps–Iraq (MNC–I) corps engineer brigade headquarters, the Headquarters and Headquarters Company, 411th Engineer Brigade (Theater Army), provided proactive, timely, relevant, and essential command and control for more than 3,000 engineer Soldiers, Airmen, and Sailors throughout Iraq in support of Operation Iraqi Freedom. The brigade’s mission included assured mobility, military construction, and geospatial engineering. The brigade headquarters also exercised administrative control for all United States Army engineer units operating in support of United States Marine Corps expeditionary forces in Multinational Force–West.

The brigade theme—*Plan, Build, Protect: Assisting Iraq!*—resounded in each and every endeavor across the theater of Iraq. The commander of the 411th Engineer Brigade challenged his Soldiers to “bring forward the leadership” shown during the mobilization’s early stages. He then introduced the command message as the brigade received its mission from the 130th Engineer Brigade, the previous MNC–I theater engineer brigade:

The 411th Engineer Brigade is called to duty by our nation. We are clearing IEDs [improvised explosive devices] from the road systems to protect the coalition force’s mobility within Iraq to allow the continued building of a free, independent Iraqi government. Army Strong!

The commander further explained the brigade’s theme:

- **Plan:** Through initiative and innovation, the patriotic American service members of the 411th Engineer Brigade contribute their engineering skills to plan, design, and maintain critical lines of communication and force protection for coalition Soldiers, Airmen, Sailors, and Marines.
- **Build:** The 411th Engineer Brigade Service members aggressively execute the construction of logistical support platforms and force protection structures to sustain and protect coalition forces endeavoring to assist Iraq in building a free and independent nation.
- **Protect:** Through intelligence analysis, the clearing of IEDs from main supply routes (MSRs), and the construction of force protection measures, the 411th Engineer Brigade



Engineers place cement pads in preparation for surge forces.



Soldiers and Airmen build a tactical operations center for the 1st Cavalry Division.

service members protect the brave coalition forces dedicated to helping Iraq achieve its governmental goals.

Mobilization and Deployment

The 411th entered 2006 continuing with preparations for the unit's upcoming mobilization and deployment in support of Operation Iraqi Freedom. In January, the commander was selected as the next commanding general of the 99th Regional Readiness Command, and in March, he handed the reins of the 411th over to a new commander. Planning and coordination continued into the spring as the headquarters prepared for a four-phased mobilization.

In April, the first of four elements of the brigade headquarters mobilized. Soldiers from the brigade's construction management section (CMS) reclassified their military occupational specialty as technical engineers with six weeks of training at Camp Grafton, North Dakota. The CMS section had to be reconstituted after the original CMS section mobilized and deployed in 2004 with the 420th Engineer Brigade, which did not have an organic CMS section.

In May, the leaders mobilized for the reconnaissance/predeployment site survey (PDSS) to Iraq with the 130th Engineer Brigade. The PDSS allowed the staff to see firsthand where the brigade would operate and to meet the staff of the 130th. This survey allowed the staff to conduct detailed planning for assuming the mission and occupying the headquarters building. Following the PDSS, the leaders returned to Fort McCoy, Wisconsin, for continued mobilization training.

In June, Soldiers from the brigade's command group and representatives from the personnel; intelligence (G2); operations, plans, and training; logistics (G4); and communications sections and the CMS traveled to Fort Hood, Texas, to participate in the III Corps mission rehearsal exercise

(MRX). The MRX brought together the corps's separate brigades, such as the 411th Engineer Brigade. Although the MRX did not involve the brigade staff in the exercise play, the staff used the time to develop situational awareness and staff products for use later in the deployment. The balance of the Headquarters and Headquarters Company later mobilized and deployed to Fort McCoy, where it conducted Soldier readiness processing and individual validation tasks.

September brought the movement from Kuwait into Iraq and the beginning of the relief in place/transfer of authority (RIP/TOA) with the 130th Engineer Brigade. On 19 September 2006, the authority, responsibility, and mission of the MNC-I corps engineer brigade passed to the 411th Engineer Brigade. By the end of that week, the 130th, an Active Army unit, had fully redeployed back to its home station in Germany, and the 411th Engineer Brigade officially had command and control of more than 3,000 Soldiers, Airmen, and Sailors across the theater. The span of command and control included Active Army, Reserve, and National Guard from the United States Army and United States Air Force. The brigade headquarters even had a Navy lieutenant commander attached to it.

The Mission

Assured Mobility

The brigade's assured mobility mission to ensure unimpeded traffic on the corps MSRs had five components:

- Route clearance—Locate and clear IEDs.
- Rapid crater repair—Fill previous blast holes and deny the enemy a favorite place to hide IEDs.
- Culvert denial—Block the openings of culverts to impede the enemy's ability to hide large amounts of explosives in the openings, causing massive road destruction when detonated.

- Route sanitation—Clear road shoulders and medians of debris and vegetation used to hide IEDs.
- Bridging—Repair or replace damaged bridges on critical routes.

Under the command and control of the brigade headquarters, the results of these efforts were phenomenal.

Route Clearance. As the corps engineer brigade, the 411th executed command and control of the 875th Engineer Battalion, which performed route clearance along the corps MSR. This mission was essential to ensure the uninterrupted flow of supply convoys throughout Iraq. The brigade's route clearance teams moved through the operating space of multiple brigade combat teams (BCTs) in a complex and dangerous environment.

The brigade headquarters was especially proactive in monitoring emerging enemy trends to ensure that teams were clearing IED hotspots during the enemy's preferred emplacement times. The results of this effort were exceptional. Twelve route clearance teams cleared more than 394,000 kilometers of roads with more than 1,344 IEDs found over a 12-month period. As a testament to the targeting effort the brigade staff directed, the 12 teams consistently found and cleared more than 59 percent of all IEDs on the routes for which they had responsibility. In addition to these regular missions, the brigade route clearance battalion was frequently

called on to clear additional roadways for the BCTs in direct support of their combat operations.

Rapid Crater Repair. The brigade headquarters facilitated and synchronized rapid crater repair teams by using heavy engineer equipment from the two engineer battalions under its control to fill previous blast craters along critical routes. The teams dramatically reduced favorite enemy hiding places for IEDs by repairing more than 700 craters.

Culvert Denial. Once the enemy began placing explosives inside culverts to interfere with mobility on the MSR, the 411th began a process of denying access to these culverts throughout its area of operations. Its CMS developed a playbook of options for the various types of culverts found in Iraq. This playbook was adopted throughout the Iraqi theater of operations by other engineer units.

Route Sanitation. The final piece to keeping the MSR open is the route sanitation mission. By using engineer equipment to clear road shoulders of debris and vegetation, route sanitation teams made it harder for the enemy to conceal IEDs, which resulted in fewer lethal IEDs and increased success for route clearance teams. During the course of the year, more than 70 route sanitation patrols removed debris along 750 kilometers of routes north and south of Baghdad.

Bridging. As the higher headquarters for all military bridging assets in the MNC-I, the 411th provided a vital capability for the corps commander to respond to the damage or destruction of critical bridges anywhere in Iraq. In addition to this rapid response mission, the brigade conducted multiple bridging, rafting, and riverine operations. The brigade also provided military bridge emplacement and inspection training to the Iraqi army to develop a Mabey Compact 200® bridge capability.

Bridging operations included emplacement of Mabey bridges at six locations; repair of IED-damaged overbridges on four occasions; emplacement of an assault float bridge (AFB); repairs to an AFB on two occasions; and plans for the emplacement of an AFB bypass. Additionally, the brigade conducted continuous rafting operations across the Euphrates River for nearly 12 months, providing essential mobility support to both coalition forces and the local populace.



HESCO Bastion Concertainer® units surround an ammunition holding area.

Military Construction

The 411th exercised command and control for all echelon-above-division construction, design, and construction management units in Iraq. This joint force of Army and Air Force engineers was responsible for design, management, and execution of corps priority construction missions on and off major contingency operating bases (COBs) and smaller forward operating bases (FOBs).

The brigade's initial efforts in base camp design, construction, and master planning throughout Iraq were focused on the improvement of the COBs, the closure of smaller bases, and the movement of units there to larger enduring bases. The brigade made a complete turn halfway through its tour, when the president announced that additional BCTs would be sent to Iraq. With a joint force of Army and Air Force facilities and design engineers, the brigade played a central role in the corps requirement to bed-down an additional surge of Soldiers deployed to Iraq over a short time frame.

The brigade's facility engineers and designers worked closely with the area support groups to develop innovative ways to house and maintain these additional Soldiers and their equipment. In addition to already existing bases, the brigade CMS planned the construction of a new base in a remote area. With no existing infrastructure, the section used a variety of methods to create a base camp capable of housing Soldiers, contractors, and their equipment. While this new base camp was under construction, the CMS moved on to plan and design the bed-down of four additional BCTs on six separate FOBs.

Throughout the year, the four facility engineer teams, under the oversight of the CMS, continued to program and design improvements at the four major COBs. In addition to troop construction, these teams developed a military construction program. Regardless of the service or type of mission, the teams consistently performed to high standards and consistently exceeded the expectations of their customers.

Geospatial Engineering

The brigade provided timely and accurate geospatial engineer support to operations throughout Iraq through terrain analysis and map production. The brigade G2's topographic section completed more than 450 requests for information in support of the corps engineer priority route clearance and construction missions. By creating multiple special products, the section provided construction support for four combat teams with more than nine surge missions, including base camp buildups. The section was also instrumental in producing maps and imagery in support of the United States Army Defense Ammunition Center. Additionally, the section printed numerous imagery photo mosaics with range fans for the guard towers at a logistics support area, which greatly enhanced the situational awareness of the Soldiers maintaining security for that base.

Logistics Support

While mobilized and deployed in support of Operation Iraqi Freedom, the brigade G4 section developed a coherent team of Soldiers from different units who planned, coordinated, and executed the brigade's logistical requirements. This included managing and operating a construction material yard that procured and distributed construction materials in support of more than 200 projects and missions on all the major operating bases, three major surge projects, and more than 400,000 kilometers of route clearance and blast hole repair. This section also monitored the brigade's supply accountability system to ensure the maximum utilization of its equipment. It coordinated maintenance operations for more than 2,800 pieces of equipment, resulting in a high operational readiness rate for the brigade's route clearance fleet and ensuring that the brigade's other low-density specialty equipment remained available for operations. In order to ensure that this equipment could be used under combat conditions and protect our Soldiers, Airmen, Sailors, and Marines, this section oversaw the fielding of numerous pieces of counter-IED equipment.

The logistics section also executed the brigade's container management system, averaging more than 650 containers daily, ensuring that there were no commercially owned containers on hand. Further, Soldiers of the brigade headquarters operating the Class IV yard packed or unpacked and moved more than 450 containers of construction material in support of surge operations. Finally, in support of all these operations, this section monitored and coordinated the request and execution of millions of dollars in nonstock funds, ensuring its proper execution and use in support of the brigade's missions.

Summary

The 411th Engineer Brigade left its footprint at more than 27 locations during its tour in Iraq. Each unit that served under the command—whether under administrative, tactical, or operational control—proved itself *Army Strong*. The 411th is grateful to every Service member who answered their nation's call to duty. The following articles (pages 8 through 21) highlight the brigade's successes and exemplify the drive of every Soldier, Airman, and Sailor to *Plan, Build, Protect: Assisting Iraq!*



Major Snel was the 411th Engineer Brigade public affairs officer for Operation Iraqi Freedom. He has served as a combat heavy platoon leader, executive officer, and construction inspection officer. He entered the Active Guard/Reserve (AGR) Program as an evaluation officer at the Army Reserve Readiness Training Center and continued in the AGR Program as a battalion liaison officer and battle captain during Operation Enduring Freedom and Operation Iraqi Freedom, as a combat mechanized company commander, and a brigade chief of operations. He holds a bachelor's in mathematics from Norwich University.

Assured Mobility

By Major Craig Wertheim

During its year in Iraq, the 411th Engineer Brigade (Theater Army) designated key individuals for its assured mobility cell, which supported the brigade's main effort of keeping the corps main supply routes (MSRs) open for coalition forces. The missions consisted of—

- Route clearance.
- Blast hole repair.
- Route sanitation.

The first step in this main effort was route clearance. Planning for it started at the intelligence section, which compiled and analyzed all of the significant events from the previous weeks that occurred on the routes. The assured mobility cell then derived targeting recommendations for the brigade's route clearance battalion. Based on the slate of targeting recommendations, the route clearance battalion produced schedules that the companies used to perform their route clearance missions to force open the MSRs in support of coalition forces and the Iraqi people. During these long and dangerous missions, the engineers looked for improvised explosive devices (IEDs). The route clearance missions took up a good part of the day on the road. The Soldiers were

engaged frequently by the enemy either with IEDs, small arms fire, or a combination of both.

The benefit of being a corps asset was the ability to send Soldiers wherever they were needed during operations. This support was in the form of additional route clearance assets when the maneuver units needed them. On numerous occasions, the 411th route clearance teams were called to clear the way for combat teams, allowing them to project combat power during operations. During the year-long tour, the route clearance teams performed 2,800 patrols, traveled more than 350,000 kilometers, and cleared more than 1,000 IEDs.

The second step to assured mobility was to deal with the blast holes formed when an IED detonated on a road. These holes ranged from a small indentation up to a crater that could swallow a truck. To combat these holes, the brigade used construction assets from its construction and combat engineer battalions. This operation took not only engineers but also a combined arms team to make it a success. Frequently, the brigade sent out reconnaissance teams to identify and inventory new holes throughout the area of operations, and this data was made available to all units that crossed the area. It was important to inventory these obstacles to speed repair operations and prevent future IED attacks.

Once the engineers performing the work identified which holes would be filled on a mission, the brigade contacted the brigade combat teams (BCT) that owned the battlespace to coordinate security for the operation. Then the mission was confirmed, supplies were ordered, and the mission was executed. On a given mission the team could fill three to eight holes, depending on their size. The final job for the team was to mark each hole with a distinctive number and symbol. This allowed identification by friendly forces and helped track whether the hole was ever used again by anti-Iraqi forces (AIF). Security was needed to observe the blast holes to ensure that AIF did not emplace another IED in the hole just filled in. When the holes were repaired, the



Soldiers from the 92d Engineer Battalion repair a blast hole formed by an IED detonation.



Vegetation and debris are cleared from the median and shoulders of the MSR as part of route sanitation.


road was ready for traffic to resume. The 411th filled more than 600 blast holes along the corps MSR during its deployment.

The third step toward assured mobility was route sanitation, which consists of clearing vegetation and debris from the median and shoulders of the MSR. In Iraq, where IEDs are placed in every imaginable shrub or piece of trash, route sanitation is essential to keeping the MSR open. It was left to the route clearance battalion to decide when and where

to perform this mission. Clearing the MSR of vegetation and debris disrupts the enemy's ability to emplace IEDs close to where coalition and civilian vehicles travel. It also inhibits concealed movement by AIF, diminishes their ability to set up traps, and forces them to place their IEDs farther back from the road. This standoff increases the survivability of coalition forces. Route sanitation is a never-ending battle in Iraq. The brigade usually ran multiple sanitation missions each week.



After finding an IED during one of its missions, the route clearance team blows it in place.

The 411th made great strides in assured mobility. The route clearance teams' rates for IEDs found and cleared rose steadily, but this was not without sacrifice. The brigade had 10 Soldiers killed in action and numerous Soldiers wounded. As the corps brigade, it had the flexibility to help reach out and impact the corps mission. The 411th saved countless lives, not only for the coalition but for the Iraqi people as well. IEDs will continue to be the enemy's weapon of choice, and engineers will continue to clear a path through them to victory. 

Major Wertheim was the 411th Engineer Brigade assured mobility section leader. Previous assignments include vertical construction platoon leader, aide-de-camp, company commander, and battalion intelligence officer. In the civilian sector, he is the sales manager for Holland & Sherry Incorporated, a luxury fabric importer.

Al Bakir Freshwater Treatment Plant

By First Lieutenant Darren J. Friot and Lieutenant Colonel James H. Lukehart

The Al Bakir freshwater treatment plant is part of the Balad Air Base complex, which was built in the 1970s and 1980s as part of Saddam Hussein's military buildup. It is located on the banks of the Tigris River about two kilometers from the base perimeter. A Yugoslavian company under contract to the Iraqi government designed and built the plant, with most of the construction being completed by Yugoslavian workers. The plant was built to provide potable and irrigation water to the base and the nearby village.

In May 2004, members of the 86th Engineer Team (Dive) inspected the Al Bakir freshwater intake lines, designed to draw their water from the neighboring river. The team found only one of the four intakes exposed, and the other three buried beneath a 15-foot mound of sediment. The team proposed five courses of action to keep the intakes clear of sediment. But no action was taken at the time, and the final water intake became clogged by 2005. As a result, a temporary aboveground pumping station was installed by the Iraqis.

Existing Situation

The 411th Engineer Brigade construction management section (CMS) first visited the Al Bakir freshwater treatment plant in September 2006. The plant was operational, but its cisterns were being filled by the cobbled-together system of pipes and worn-out pumps that were set on the ground, exposed to the elements and vehicular and foot traffic. This system was in poor condition, leaked badly, and required that all water be pumped into the cisterns before it could be processed through the rest of the system. Water could not be pumped directly to the clarifiers for processing. The pumps used to get water from the chlorinated water tanks to the water net were undersized and worn, providing only a portion of the water needed in the peak summer months, when temperatures frequently exceed 120 degrees. The generator that powered the water plant was worn-out, and there was no backup generator to pick up the load if the first generator failed or was down for maintenance. The gravity lines that fed the two large cisterns were nonoperational.

The managers at the Al Bakir freshwater treatment plant had decided that the only way to keep the plant operational was to pump water into the cisterns, so two much-worn pumps had been installed at the Tigris River. These pumps effectively bypassed the gravity feed lines that had become completely unusable. The remaining parts of the plant were worn but still serviceable. Raw water from the cistern was being pumped to



Al Bakir water tower

the clarifiers, then to the sand filters, then injected with chlorine, stored in tanks for 24 hours, and finally pumped to the village of Al Bakir for consumption. The pumps installed at all stages of the process were badly worn but continued to operate. A 250,000-gallon water tower was not operational, which added further to the strain on the system's pumps. The Iraqi national power supply was sporadic, lasting four hours a day at most. The plant provided 250,000 gallons of potable water and 150,000 gallons of irrigation water to Al Bakir and its 5,000 residents daily. When fully operational, the plant was capable of providing more than 650,000 gallons of potable water and 500,000 gallons of irrigation water daily.

Scope of Project

To adequately upgrade the Al Bakir freshwater treatment plant, a design incorporating the jury-rigged system the Al Bakir engineers had built was deemed the most



Pump station for treated water at Al Bakir


practical and versatile solution. The original gravity feed system to the cisterns was considered unsalvageable and was abandoned due to the almost constant maintenance required to keep it free from sedimentation from the high silt content of the Tigris River. Several innovations not found in the original system, but added on the temporary Iraqi system, were incorporated into the new permanent design. These innovations included separate lines to deliver water directly to the clarifiers, bypassing the cisterns and smaller intake lines that could be pulled and repaired if damaged or blocked by sedimentation.

Since a functional water tower was deemed critical for the system to function properly and not put undue wear on the pumps in the water system, the nonoperational water tower would have to be repaired.

The 411th Engineer Brigade would work in cooperation with the Iraqi engineers responsible for keeping the Al Bakir plant running. It was understood from the start that this project would be designed and built by Iraqis. The 411th would provide engineer expertise and an independent government estimate once the project was ready to move forward. As part of working with the Iraqi engineers, the 411th prepared its own designs, engineering calculations, and construction drawings and specifications to facilitate an accurate independent government estimate to apply for a Commander's Emergency Relief Program (CERP) funding packet.

Conclusion

The project received CERP funding, and the contract was executed at a cost below the original estimate. An extensive knowledge of what the project required and

an excellent working relationship between the 411th Engineer Brigade CMS engineers and the Al Bakir engineers helped the project proceed smoothly, and it was completed in April 2007 without any significant problems. Al Bakir now has a reliable source of water from the ancient Tigris River for its freshwater treatment plant and the potential to provide water to neighboring villages. 

First Lieutenant Friot is the commander of Headquarters Company, 411th Engineer Brigade. His previous assignments include civil engineer/construction inspection officer with the 411th Engineer Brigade construction management section, Balad, Iraq; and executive officer and platoon leader, C Company, 479th Engineer Battalion. In his civilian career, he is an operations leader with the General Electric Company, Schenectady, New York. He is a graduate of Clarkson University, Potsdam, New York.

Lieutenant Colonel Lukehart was the deputy engineer for the 411th Engineer Brigade construction management section. His previous assignments include deputy adjutant, 70th Regional Readiness Command; executive officer, 3d Chemical Battalion, 104th Division (Institutional Training); and operations and training officer, then commander of the 476th Chemical Battalion. In his civilian career, he is a facility manager for the University of Washington in Seattle. He is a graduate of the United States Army Command and General Staff College and holds a degree from the University of Washington.



Building a Base Camp

By Lieutenant Colonel Thomas J. Shea III

Most engineer officers never get the chance to see a base camp built from scratch, but I have had the opportunity to build two. The first was Camp Powderhorn, built in the Yoro Mountains of Honduras to support Exercise Fuertes Caminos 88. The second was Forward Operating Base (FOB) Hammer, recently built in an equally remote area in Iraq for the surge during Operation Iraqi Freedom.

Camp Powderhorn

Engineer Task Force 111 built Camp Powderhorn to very austere standards. We did not have access to the Internet; morale, welfare, and recreation (MWR) support; telephone systems; or the robust maintenance infrastructure that we can provide today at an FOB. An advantage we did have was that we designed, built, and lived in it—we were our own customer. Another advantage was that we had almost a year of lead time before we had to occupy the camp. Thus, we had plenty of time to lay it out, identify the required facilities, and develop the bill of materials (BOM). When the 52d Engineer Battalion arrived to build the camp, all the materials were on hand. Given the low security threat, we could drive an hour to the nearest hardware store for supplies, or two hours to a larger city for other supplies or repair parts.

Camp Powderhorn had the basics of a 1,000-person base camp. We built a shower facility and mess hall and used tents for command and control, billets, and an aid station. The 249th Engineer Battalion (Prime Power) provided two generators, and a quartermaster company provided water purification, shower, and laundry services. Communications consisted of a loud speaker, a radio teletype rig, and four satellite phones.

Finally, we had a small post exchange that sold junk food and beer. Life was very simple and good.

FOB Hammer

FOB Hammer was almost the opposite in every respect. In January 2007, with the notice of the surge of forces into Iraq, Multinational Corps–Iraq (MNC–I) began its planning and decision-making process to determine where it would use each incoming brigade combat team (BCT). The outcome was a basing plan that fell to the corps engineer brigade, the 411th Engineer Brigade, to construct. In this case, MNC–I selected the Butler Range Complex as a site to house a BCT. Built a few years earlier, the range offered enough open space to construct an FOB. MNC–I told us to have the camp ready to accept the first elements by mid-March 2007.

Site Reconnaissance

Accepting some uncertainty in the final boundaries of the site, MNC–I and the 411th Engineer Brigade construction management section (CMS) conducted a joint reconnaissance of the proposed site. A single building to use and an understanding of the limits of the new base camp were the results. The CMS then sent a survey team to conduct a detailed topographic survey of the proposed camp, while the rest of the section used overhead imagery to begin to lay out the facilities and develop the force protection plan. Before its completion, the limits of the camp and its name changed several times.

Planning

To synchronize the many aspects of the planning and execution of the construction, we formed a special team within

the brigade from the primary sections involved in the planning: operations, supply, CMS, and the subordinate units. This team gathered regularly to identify and resolve issues and met with the MNC-I engineer section (C7) and the 13th Sustainment Command (Expeditionary), both of which conducted similar meetings. The cross-communication was critical to the ultimate success of building FOB Hammer.

The basic plan for the camp was to use Army Force Provider kits and supplement critical facilities with Southwest Asia (SWA) huts. A Force Provider kit provides tents, environmental control units, generators, kitchens, dining areas, MWR tents, beds, and a chapel, as well as laundry, latrine, and shower facilities. Engineers are required to prepare the ground, construct force protection measures, and install electrical and plumbing components. Since only four Force Provider kits were available, MNC-I contracted for the remaining necessary tents, beds, generators, and environmental control units.

Construction Priorities

The base camp was planned in increments that supported the MNC-I priorities for construction. The general layout of the camp included areas for each unit as well as areas for contractor general life-support functions, such as—

- Burn pit.
- Water purification units.
- MWR.
- Entry control points.

We also considered special topics, such as—

- Detainee holding area.
- Brigade medical treatment facility.
- Helipads.
- Force protection.

The result of this planning was the recognition that the entire BCT could not be moved into SWA huts. Thus, it was decided that key facilities such as the brigade headquarters, battalion headquarters, medical treatment facility, and maintenance facilities would be placed in SWA huts. Everything else would stay in tactical vehicles or field tents drawn in Kuwait. These facilities were then prioritized for the 411th to build.



Airmen construct future brigade headquarters.

Coordination

During the entire planning time and well into the construction phase, interface was nonexistent with the surge unit, which was either at its home station or in Kuwait training for its upcoming mission. Eventually, some contact was established via e-mail or a liaison officer, and the surge unit was able to review the overall site plan and the layouts for the brigade and battalion SWA huts. We received minimal comments and made all of the requested changes. Mostly, the leaders of the surge units had to trust that we were going to do the right thing for them, and the CMS did not take that responsibility lightly. Once the surge unit hit the ground, additional coordination began and the combined team made several site changes.

Building Design

The actual design of the SWA huts was relatively easy. The CMS used several sources, to include the Theater Construction Management System and previously built SWA huts. One alteration was to the width of the building. This change accommodated the RED HORSE squadron since it already had jigs built for the roof trusses. To speed up the process, we gave the construction unit our designs in increments, such as the initial layout, finalization of the details, and development of the BOM. This served several functions: it allowed the constructing unit as much time as possible to conduct its planning and provided a review process to catch errors and omissions in the BOM.

Construction Priorities

In keeping with MNC-I construction priorities, we started with the perimeter berm and concertina wire, and at the same

“Most engineer officers never get the chance to see a base camp built from scratch, but I have had the opportunity to build two.”

time we built a small engineer camp to house the construction force. HESCO barriers for force protection around the housing areas, the billeting tents, and the dining facility came next. The overriding goal was to provide a safe place for the surge unit to live and eat. The burn pit, water supply, and blackwater lagoon were the next priorities for horizontal construction, while the brigade headquarters, medical facility, and battalion headquarters were priorities for vertical construction. A brigade ammunition holding area, a detainee holding annex, and upgrades to the existing helipads were also constructed.

While most force protection measures in Iraq use the T-Wall®—a precast concrete retaining wall system—or some variation of it, the tactical situation at the time of the construction prevented us from using it. Instead, we used 7-foot and 4-foot HESCO barriers. A key lesson to remember is to develop a drainage plan for the area protected by the barriers. This includes grading the area to create a sloping crown, ditching key areas to drain the water to where you want it, and including seep pipes under the barriers to allow additional draining. Failure to include this will create a pool and a mud bath, which Soldiers will not enjoy.

The 411th Engineer Brigade was fortunate that the RED HORSE squadron assigned to the mission was composed of National Guard personnel who recently performed a similar mission in support of Hurricane Katrina relief. The squadron provided the command and control cell and half of the construction force, while the 92d Engineer Battalion from Fort Stewart, Georgia, provided its Bravo Company as the other half of the construction force. It was a pleasure to watch these two units come together and operate as a single joint force.

Logistics

The final critical piece to the whole operation was the logistics. As previously stated, the camp was in a remote location. If located in the United States or some other part of the world, the distance to a nearby town might not be too great, but this was Iraq. Everything had to be trucked in—Force Provider kits, contractor tents, lumber, electrical BOM, water, and all classes of supply. (Eventually, a water source was found, so it was no longer necessary to truck it in.)

In addition to the normal logistical packages, the 411th Engineer Brigade supply section sent more than



Construction on the medical treatment facility began once force protection measures were in place.



Construction of an engineer living area was a top priority.

300 containers of lumber, concertina wire, and electrical parts to FOB Hammer. We had to procure all of the electrical BOM locally. And while the Iraqis can deliver dimensional lumber fairly quickly, it took at least 30 days to deliver electrical parts. That was after awarding the contract, which takes about 30 days. Since our regulations consider construction materials to be permanent supplies, our field ordering officers are not allowed to purchase them. Special care must be taken in the identification of the BOM, or the project could be delayed 60 days or more.

Gravel and concrete pose a special problem in Iraq. For FOB Hammer, we initially programmed more than 100,000 cubic meters of gravel for roads, limited dust control, and the maintenance areas. Gravel deliveries from the three companies with contracts were slower and of lower quality than expected. The constant problem with gravel in most of Iraq is that it is river run and not well gradated. This leads to poor quality concrete and roads that require constant maintenance. We never found a contractor willing to deliver ready-mix concrete to the camp.

Summary

During the initial buildup of the camp, the 13th Sustainment Command (Expeditionary) and its 15th Sustainment Brigade provided outstanding support. It was interesting to learn that when the 15th sent a small party to FOB Hammer to coordinate logistical support,

they brought their own communications package, including long-range voice and satellite voice and data capabilities. The engineers, on the other hand, relied on a single AN/PRC-150 radio—mounted in a high-mobility, multipurpose wheeled vehicle (HMMWV)—and a TeleEngineering Toolkit. We had no way to send e-mail messages with status reports, requests for BOM, or construction drawings in a secure and timely manner. As a result, I believe it is important that we take a hard look at how we are equipping our new deployable brigade command posts and ensure that they have the same communications capabilities that other brigades have.

Although the experiences were quite different, planning and building Camp Powderhorn and FOB Hammer were both very rewarding. The challenges of building a base camp from scratch can be daunting. But by building on the lessons learned from others, we can quickly provide our Soldiers the accommodations they need to support their missions.



Lieutenant Colonel Shea serves as the design engineer for the 411th Engineer Brigade. His active duty assignments include Korea; Honduras; Turkey; Fort Stewart, Georgia; and Fort Dix, New Jersey, serving in both troop and United States Army Corps of Engineers® (USACE) positions. His Reserve assignments include USACE, the 411th Engineer Brigade, and the 305th Engineer Detachment (Real Estate). In civilian life, he is a New York District USACE project manager.

U.S. Air Force Photo/Courtesy of the 557th EHRHS



Army and Air Force Engineers Provide Bed-Down for Surge Troops

By Captain Ken Hall

Earlier this year, only dirt and desert tumbleweeds could be found 1½ miles southeast of Besmaya Range, where Iraqi soldiers train. But then a United States Army unit—the 3d Brigade Combat Team (BCT), 3d Infantry

Division—conducted missions in Operation Enforcing the Law, known to the media as the *Fardh al-Qanoon*, or “Baghdad Security Plan.” That plan began when General David Petraeus, commander of Multinational Forces–Iraq (MNF–I), directed

new combat brigades to deploy in and around the Iraqi capital. On 18 February, orders flowed from MNF–I to the Army’s 411th Engineer Brigade to build a base at Besmaya to accommodate troops by 26 March. The Besmaya project was just one of many the 411th was tasked to accomplish as part of its main missions, which included—

- Route clearance and sanitation.
- Rapid crater repair.
- Engineer support to the 3d Infantry Division and other combat units.
- Planning, design, and construction of contingency operating bases.
- Command and control of tactical bridging assets.

The 411th was organized to accomplish those missions, with assistance from subordinate units that included the Arkansas Army National Guard’s 875th Engineer Battalion, the Active Army’s 92d Engineer Battalion, and the United States Air Force’s 557th Expeditionary RED HORSE Squadron (ERHS). The 557th ERHS, performing an “in-lieu-of” mission for the Army in Iraq, built the base 30 kilometers east of Baghdad. Approximately a month later, Soldiers had a place to hang their hats at night “inside the wire.” RED HORSE, which stands for “rapid

U.S. Air Force Photo/Courtesy of the 557th EHRHS



Soldiers from the 92d Engineer Battalion complete guard towers along FOB Hammer’s perimeter berm in Iraq. Airmen from the 557th Expeditionary RED HORSE Squadron and Soldiers from the 92d Engineer Battalion’s “Black Diamonds” were tasked to bed-down the Army’s 3d BCT, 3d Infantry Division, in support of the Baghdad Security Plan.

engineer deployable heavy operational repair squadron, engineers,” provides the Air Force with a highly mobile civil engineering response force to support contingency operations worldwide. With Airmen from Active, National Guard, and Reserve Component assets, the 557th is engaged in engineering projects throughout Southwest Asia. The unit is part of the 732d Air Expeditionary Group, under the 332d Air Expeditionary Wing headquartered at Balad Air Base northwest of Baghdad.

A bed-down tasking is a two-step process for the engineer force. First, the force itself needs facilities to work, sleep, and eat. Then the main engineer force can move in and begin construction on the tasked project. As part of step one, engineers from the 557th ERHS and the 411th Engineer Brigade formed a survey team and deployed to the site to work out detailed plans for the new base. What they found was spartan. A bombed-out structure remained, with only three walls intact and a roof that was caving in. Other buildings had been reduced to rubble that would need to be cleared for new facilities. Surrounding it all was a 3½-foot berm, traversed by goat trails, that formed a protective perimeter barely substantial enough to trip over. They had their work cut out for them. The 411th’s construction maintenance section (CMS) completed a site reconnaissance with members of the MNC-I logistics and engineering sections, walking the site and taking photographs. Then the CMS and members of the 557th conducted a site survey to collect topographic information and overhead photographs to drop into the computer-aided drawing software to plan and build Forward Operating Base (FOB) Hammer (see article, page 12).

While the five-day survey was being conducted, RED HORSE engineers back at Balad Air Base were planning how to bed-down the engineer force. They determined that the force would need a tailored Harvest Falcon kit (a prepackaged,



Photo by Rob Curtis/Air Force Times

RED HORSE engineers install roof trusses as they build up FOB Hammer for the 3d BCT in Besmaya, Iraq.

transportable base camp) to sustain them while they built the rest of the base for the troops of the incoming 3d BCT. A full Harvest Falcon kit includes tents, hard-wall shelters, area

U.S. Air Force Photo/Courtesy of the 557th EHRHS



Soldiers from the 92d Engineer Battalion fill HESCO Bastion Concertainers® for force protection at FOB Hammer.

More than 33,000 cubic meters of debris were removed from land at FOB Hammer.



U.S. Air Force Photo/Courtesy of the 557th EHRS

lighting systems, basic water and electrical systems, latrines and showers, a kitchen facility, environmental control units, and other basic equipment. The first five days of actual construction saw huge amounts of Harvest Falcon assets moving from outside Iraq to Balad by numerous aircraft, then convoyed by tractor-trailer and helicopters to Bismaya to build the facilities for the engineers. In addition, heavy equipment (loaders, bulldozers, graders, and excavators) and supplies (food, water, fuel, hand tools, and lumber for tent flooring) were transported to the site in the continuous stream of convoys and helicopter loads.


While they were building the engineer facilities, materials for the main camp were being moved in, including—

- Three Army Force Provider kits.
- Two life support area kits.
- Reverse osmosis water purification units (ROWPU) to produce fresh water.
- Lumber, plywood, and nails to construct Southwest Asia huts.
- Concertina wire and pickets.
- Prefabricated guard towers.
- Bottled water; meals, ready-to-eat; and 50-person unitized group rations to sustain the construction force.

As materials came in to Bismaya, the construction force already there began erecting the tent city and fortifying the perimeter berm. The RED HORSE Airmen focused on vertical construction while Soldiers from the 92d performed the horizontal construction. The camp was designed to provide

the 3d BCT with dining facilities and a headquarters made by refurbishing the bombed-out structure. Each battalion was to get a tactical operations center and maintenance building. Prefabricated guard towers, elevated fighting positions, and perimeter berms would provide force protection. Morale, welfare, and recreation facilities would complete the project.

Water for the camp comes from the Tigris River, which makes its way toward the camp through an old canal system. To make it usable for the brigade, engineers had to undam several points on the canal to get the water to within 2½ miles of the camp. It is first pumped to a new holding pond, then pumped to two ROWPUs where it is made potable and pumped to water storage bladders. The potable water stored in the bladder farm provides drinking water for the brigade, and the pond provides nonpotable water for showers and laundry facilities.

For the 3d BCT Soldier, all that really matters is that he and his fellow “Sledgehammer” Warriors now have a place to call home after each day’s patrols in Baghdad—a place where it is safe to take off battle armor and get a hot meal. 

Captain Hall served as deputy chief of public affairs for the 332d Air Expeditionary Wing while in Iraq and has now returned to duties as chief of public affairs for the 47th Flying Training Wing, Laughlin Air Force Base, Texas.



Reserve Component Volunteers— Filling the Gap

By Lieutenant Colonel Trent M. Andrews

Soldiers of the United States Army Reserves and Army National Guard continue to volunteer to serve beyond their 12-month tour of duty. These Soldiers extend to serve in the Army's formations wherever their military occupational specialty (MOS), experience, and leadership can be used. They are staying in-theater to continue to serve from one to two extra months. A small number of Soldiers are even raising their hands to stay for a third consecutive year. Whether it is for monetary reasons, a poor job market back home, or just a strong pull by the mission, the list of volunteers fills several pages.

The mechanism these Soldiers use is the Contingency Operation-Active Duty for Operational Support (CO-ADOS) orders. These orders are ultimately cut by the United States Army Human Resources Command in St. Louis, Missouri, but the process starts with the Soldiers. They must find a unit with an opening for their MOS or skill set, then sign a Department of the Army (DA) Form 4187 and a volunteer statement. The gaining unit must prepare a letter of justification that demonstrates how the Soldier's skills are needed to meet the unit's mission requirements. Sometimes a Soldier's skill set is not necessarily the result of MOS training. This is another example of how America's National Guard and Reserve personnel frequently bring added value to their units. For example, one unit had a volunteer who was officially in the Signal Corps but also had in-depth experience with preparing contracts. This added bonus filled a critical need in the headquarters where she served out her additional six months in-theater under CO-ADOS orders.


The journey for these Soldiers begins like many other things in the military—by stepping up and putting their names and other required information on a volunteer form. These forms are gathered at CJ-1 (the joint military section) of Multinational Corps-Iraq (MNC-I) and distributed on a master list across the theater. Units looking for Soldiers to meet mission requirements can review the list and match their needs with the MOS, rank, and availability date of the volunteer. Once a tentative match is made, the coordination to prepare the CO-ADOS packet begins. The Soldier and gaining unit must sign the DA Form 4187, and the Soldier signs the volunteer statement to extend in-theater for the mutually agreed upon period of time. The gaining unit with the first colonel in the chain of command then signs a letter of justification for the Soldier to stay on active duty orders, and the entire packet is forwarded to CJ-1 for the next step in the review process.

When Reserve or National Guard units prepare to mobilize and deploy, they often have vacancies on their manning rosters, also referred to as battle rosters. Since Operation Iraqi Freedom has extended over multiple rotations, the number of Soldiers who have not deployed is small. A unit may then

actively seek Soldiers who are willing to return to Iraq for another rotation. Also, Soldiers may hear of a unit getting ready to deploy and volunteer to join that unit. These efforts work toward filling 100 percent of the modified table of organization and equipment (MTOE) requirements, but may still leave the unit short of meeting critical mission requirements not addressed by the MTOE. The 411th Engineer Brigade, a United States Army Reserve unit from New York, experienced such a deficit. The brigade discovered during its pre-deployment site survey that it would inherit a multimillion dollar Class IV yard containing construction materials for the numerous construction projects throughout the theater. The brigade's mission analysis identified a deficit of seven Soldiers to operate the Class IV yard. Efforts began in Kuwait to recruit Soldiers for this mission and initiate the CO-ADOS (then called CO-TTAD for contingency operation-temporary tour of active duty) packets to allow them to stay. Efforts continue to recruit Soldiers to fill this mission requirement as the unit deployed from Kuwait to its mission location in Iraq. The CO-ADOS mechanism contributed to the successful manning of the Class IV yard, which became critical to supporting surge construction operations for coalition forces and other MNC-I priority construction projects.

There is room for improvement in this process as it gains momentum. It would be beneficial for units preparing to mobilize and deploy to have a copy of the volunteer list before arrival in-theater in order to initiate the packets. This could be accomplished by distributing the list through United States Army Reserve Affairs to United States Army Reserve Command headquarters or to the mobilization platforms. This would help decrease the time it takes to match units' known requirements with the volunteering Soldiers.

Another significant improvement would be to allow Reserve Soldiers to serve on CO-ADOS orders with an Active Army unit (especially units without a joint manning document [JMD]), provided the MOS and grade/rank requirements are met. That change would have allowed a number of volunteers from the 411th headquarters to remain with the Active Army unit that replaced the 411th, which would have contributed to continuity and a seamless transition between the two rotations. Currently, an Active Army unit must have a JMD with Reserve Component authorizations for Reserve Soldiers on CO-ADOS orders to serve there. If the process of CO-ADOS approval allowed a letter of justification signed by a brigadier general or higher, seasoned volunteer Reserve Soldiers with necessary skill sets could remain in-theater.

The real focus of this article is to highlight the spirit of volunteerism of our nation's Citizen-Soldiers. Normal total deployment time is fourteen to fifteen months for Reserve and National Guard Soldiers, and those who volunteer and remain for an additional period of time demonstrate a patriot spirit that imbues the Army values. A total of 82 Soldiers from the 411th Engineer Brigade have volunteered to extend their service in support of Operation Iraqi Freedom. 

Lieutenant Colonel Andrews is the Assistant Chief of Staff for Personnel, 411th Engineer Brigade (Theater Army).



AIR FORCE ENGINEERS SUPPORT SURGE

By Lieutenant Colonel Douglas D. Hardman

In early December 2006, the United States Air Force's 732d Expeditionary Civil Engineer Squadron stood up Detachment 3 to support the United States Army's 411th Engineer Brigade. Replacing the 803d Utility Detachment, the Air Force detachment completed seven major construction projects during its first rotation and handed over three more projects that were in progress when it rotated out of theater. It was a testament to the Airmen and their accomplishments as part of a joint engineer team. In order to support the surge of troops in Iraq, the Airmen were tasked to completely rebuild

a much-needed facility. Existing earthen berms were demolished, then replaced with HESCO Bastion Concertainer® units. Then new berms were built around the new perimeter and roads in the area were rebuilt and strengthened. In only 21 days, the detachment doubled the storage capacity of the largest facility of its kind on location, while allowing uninterrupted operations by the facility's personnel.

To facilitate the flow of horizontal construction materials to three forward operating bases in central Iraq, the detachment was tasked with the expansion of the base's transload yard.



Detachment 3 Airmen construct a landing pad and taxiway for the 3d Infantry Division's Combat Aviation Brigade.




Airmen construct new headquarters facilities for brigade combat teams.

This expansion was integral to ensuring the safe flow of construction materials to units in the field. The Airmen completed Southwest Asia huts in support of local units. These facilities met a crucial need for troops operating in the area. With the standup of the new Multinational Division–Central and the arrival of the surge units, they were tasked to turn an existing warehouse into workspace. In only three weeks, the Airmen transformed the facility into what the

commanding general praised as “. . . a better facility than they have back at our home station.”

In addition, the Airmen pushed dirt in support of the incoming surge. In a short time, crews transformed a dry lake bed of several acres into usable land by raising the elevation of the site, ensuring positive drainage, and preparing the site to bed-down incoming troops. The detachment constructed multiple horizontal and vertical projects from scratch to support the incoming unit. The mission was again completed in a very short time, allowing the timely bed-down of the entire unit and its equipment. The surge of forces brought about the requirement for expedient command and control workspace to accommodate the incoming units. The detachment constructed tents as work centers for units supporting the incoming unit.

Finally, to improve the quality of life for maintenance personnel, the Airmen began work on projects to provide storage pads for local unit motor pools. This project will provide adequate space for vehicle maintenance personnel during adverse weather conditions.

The accomplishments of these Airmen had a direct impact on the successful execution of Operation Iraqi Freedom by providing outstanding mission support for combat units in the Iraqi area of operations. The dedication of the Airmen from Hurlburt Field, Florida; Mountain Home Air Force Base (AFB), Idaho; Charleston AFB, South Carolina; McConnell AFB, Kansas; Ramstein Air Base (AB), Germany; and Aviano AB, Italy, are a testament to the Air Force’s ability to provide fast, top-notch combat support. 

Lieutenant Colonel Hardman is the detachment commander, 732d Expeditionary Civil Engineer Squadron.



Dedication

The following members of the Engineer Regiment have been lost in the War on Terrorism since the last issue of *Engineer*. We dedicate this issue to them.

Ball, Master Sergeant Scott R.	Headquarters & Headquarters Company, 55th Brigade	Scranton, Pennsylvania
Clark, Sergeant Cory L.	585th Engineer Company, 864th Engineer Battalion	Fort Lewis, Washington
Herold, Specialist Adam G.	2d Battalion, 377th Parachute Field Artillery Regiment (Airborne)	Fort Richardson, Alaska
Herrera, Sergeant First Class Rocky H.	585th Engineer Company, 864th Engineer Battalion	Fort Lewis, Washington
Howard, Sergeant Bryce D.	585th Engineer Company, 864th Engineer Battalion	Fort Lewis, Washington
Howells, Specialist Alun R.	1st Battalion, 64th Armor Regiment, 2d Brigade Combat Team	Fort Stewart, Georgia
Ingles-Rios, Master Sergeant Julian	130th Engineer Battalion, Puerto Rico National Guard	Aguadilla, Puerto Rico
Modgling, Private First Class Joshua S.	1st Battalion, 30th Infantry Regiment, 2d Brigade Combat Team	Fort Stewart, Georgia
Steele, Captain Joshua E.	1st Brigade, 1st Infantry Division (Transition Team)	Fort Riley, Kansas
Wiens, Corporal Kory D.	94th Engineer Detachment (Canine), 1st Engineer Brigade	Fort Leonard Wood, Missouri
Zapfe, Sergeant First Class William A.	1st Battalion, 30th Infantry Regiment, 2d Brigade Combat Team	Fort Stewart, Georgia

OPERATION Sand Castle 2007

By Brigadier General Jeffrey W. Talley

Operation Sand Castle 2007 was an Army Reserve exercise designed to challenge engineers to perform their mission in a tactical combat environment. The exercise consisted of several phases, including thousands of man-hours of planning; predeployment preparation; reception, staging, and onward integration (RSOI); stability operations; and the safe redeployment of all equipment and personnel. The overall goal of the exercise was to provide each command team within the 926th Engineer Brigade the ability to train their unit as it will fight, with the stresses, operational tempo (OPTEMPO), challenges, and danger the current battlefield presents. The National Training Center (NTC) at Fort Irwin, California, was the perfect backdrop for this training.

The 926th Engineer Brigade was task-organized with units that are not a normal part of its peacetime command, but with careful planning we successfully integrated and succeeded at our combat and construction-effects missions. We built permanent additions to NTC's training facilities, while maintaining a tactical posture throughout the exercise. Our task-organized engineers, through much sweat and hard work, made NTC a more robust and effective training facility—with new buildings, improved roads, and processed material ready for use in future projects. *Some of these projects are described in the articles on pages 23 through 33.*

All Soldiers are Warriors first and their respective military occupational specialties second. Everything we do must be focused on helping brigade combat teams (BCTs) and maneuver divisions project combat power. My goal during Operation Sand Castle 2007 was to train all Soldiers and units to execute individual and collective tasks under wartime conditions, while in support of the 3d BCT, 4th Infantry Division (Mechanized). We clearly achieved that goal!

The opportunity to train alongside the BCT and exercise our tactical skills in addition to our engineering skills was of immeasurable value. We must not forget the lessons learned from this exercise and must implement them throughout the training year. Together, we must have Soldiers and units ready to deploy and fight as a team.

Brigadier General Talley is the commander of the 926th Engineer Brigade, Montgomery, Alabama.

The Birth of a City

By Sergeant First Class Craig Pickett

Hundreds of thousands of Soldiers have trained for desert warfare at NTC. All come away with an appreciation for the heat and the challenges the desert brings to even the simplest missions. However, NTC is changing. With the help of the United States Army Reserves and Operation Sand Castle, it will eventually have in its training arsenal a booming Middle Eastern town. The long-term goal of Operation Sand Castle is to construct approximately 480 buildings over 10 years, creating a small city called *Medina Jabal*. This city will provide a backdrop similar to current

operations, allowing Soldiers training at NTC to train in a robust urban environment that will help them save lives in the Middle East. The 10-year mission is now in its third year.

The 412th Engineer Command from Vicksburg, Mississippi, was the exercise agent for year three of Operation Sand Castle. The command planned training, arranged logistics, and coordinated all the participating units. The 412th brought together a balanced team of Army Reserve units to accomplish the mission and provided quality training opportunities for the Soldiers. The units were from different commands and

locations, and many had never worked together before. That fell in line with what units experience when they deploy overseas, making the training opportunity very realistic.

The 412th was also instrumental in integrating the Active Army brigade combat team (BCT) training at NTC with the Reserve elements. This gave both an opportunity to interact and to rely on each other as they would overseas on a real-world deployment. As Operation Sand Castle drew to a close, the planning had already begun for the 2008 rotation. In the works is a 10-mile section of road into the eastern expanse of NTC, as well as more buildings for Medina Jabal. As always, training will be paramount for everyone involved.



Sergeant First Class Pickett is a member of the 350th Mobile Public Affairs Detachment, an Army Reserve unit from Indianapolis, Indiana.



Photo by Sergeant First Class Craig Pickett

A Soldier mans a squad automatic weapon while on the jobsite at Medina Jabal. The heavy equipment operator with Company C, 854th Engineer Battalion, must keep an eye out for enemy forces and provide protection while his fellow Soldiers construct buildings.

Photo by Sergeant First Class Craig Pickett



Members of the maintenance section, Headquarters and Headquarters Company, 854th Engineer Battalion, fill sandbags to place around the edges of their tents to keep sand from blowing in.

Photo by Sergeant First Class Craig Pickett



A Soldier from Company A, 854th Engineer Battalion, places forms for a building at the Medina Jabal work site.

Photo by Private First Class Christine Samples



Soldiers with Company A, 458th Engineer Battalion, check for levelness while building the door frame for a building at Medina Jabal.

Photo by Sergeant First Class Craig Pickett



Soldiers of the 770th Engineer Company pave the parking lot of the post theater at Fort Irwin, California, as part of Operation Sand Castle.

PAVING THE WAY



By Sergeant First Class Craig Pickett

Thanks to the 770th Engineer Company, a Reserve unit from Penn Yan, New York, NTC is getting a fresh topping of hot asphalt on some well-worn areas. Since there were no paving missions in the emerging city of Medina Jabal, planners turned their focus to the post. Three areas were identified based on the unit's mission-essential task list,

time restraints, and project size—a portion of Barstow Road, the theater parking lot, and Hamby Barrack's parking lot. In keeping with the scope of the mission, all paving operations were done tactically, including Soldiers setting up perimeter security to guard against possible enemy attacks. The Soldiers wore full “battle rattle”—flak jacket, Kevlar helmet, and M-16 rifle—while they shoveled, pushed, and laid down the hot, rocky blend.

The noncommissioned officer (NCO) in charge of the lay-down projects was concerned about the extra gear. Since the personal equipment could get caught on machinery, leaders had to pay close attention to Soldiers as they worked and rely on battle buddies to make sure everyone was safe. Also, since the pavers work with hot equipment and materials, leaders had to ensure that Soldiers did not suffer from heat exhaustion and dehydration. Working in these conditions is not new to the Soldiers of the 770th. They deployed to Kuwait and Iraq from 2003 to 2004 and performed their paving mission daily in much worse conditions.

A Soldier uses a lute to smooth asphalt on a section of Barstow Road at NTC as part of Operation Sand Castle.



Photo by Sergeant First Class Craig Pickett

Photo by Sergeant First Class Craig Pickett



Members of the 770th Engineer Company repair a section of road at NTC in full combat gear.

Photo by Sergeant First Class Craig Pickett



A Soldier shovels asphalt to fill in the gaps as the 770th Engineer Company repairs a section of Barstow Road at NTC.

They were tasked with repairing, patching, and fixing roads so that convoys could get through easily and quickly.

The projects at Fort Irwin may not determine life or death, but they are important for those living and working on post. They will be focal points for people parking on the lots and driving on the roads. Even the slightest bump will be noticed. The civilians in charge of setting up the projects were wary of the Reserve pavers and unsure of their abilities. Paving is expensive and if not done correctly can be costly to repair. But after two days of paving, they realized that the Reservists were good at their job.

the correct rate. Some Soldiers on the crew smooth the 300-degree asphalt with long rakes, called *lutes*, while others constantly monitor the depth and make adjustments to the screed. The screed is the back portion of the paver where the asphalt is pushed under, smoothing it out and setting the thickness.



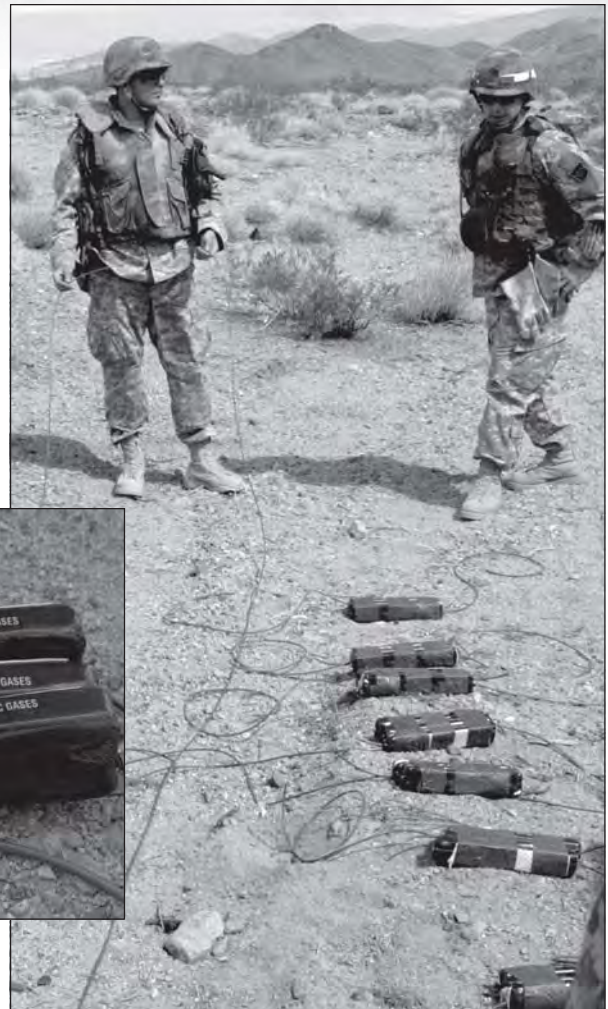
Sergeant First Class Pickett is a member of the 350th Mobile Public Affairs Detachment, an Army Reserve unit from Indianapolis, Indiana.

Engineers Send NTC Skyward

By Private First Class Christine Samples

The Soldiers of the 459th Engineer Company out of Bridgeport, West Virginia, sent large pieces of NTC airborne with C4, shaped charges, and cratering charges when they took advantage of an opportunity to practice basic familiarization and refresher training in demolition during Operation Sand Castle 2007. “Demo” does not have as high a priority as building bridges, so the Soldiers don’t often have an opportunity to do it.

Each Soldier was issued three 1-pound blocks of C4, a pliable and versatile explosive that can blow up anything from a single door to a steel building, depending on how much is used. The first step in preparing C4 for detonation involved taping each Soldier’s three blocks together and knotting them with detonation cord. Instead of burning, detonation cord



Far Right: Soldiers from the 459th Engineer Company survey a line of C4 bundles to make sure they are properly connected for the detonation.



Right: The 459th Engineer Company sent NTC airborne with the help of C4.

actually explodes, which then sets off the C4. Each Soldier then took his blocks downrange and connected them to other Soldiers' blocks with more detonation cord to create one huge blast. Well back from the blast site, at a safety area 500 meters away, the Soldiers watched as the C4 was detonated. For the engineer Soldiers in the safety area, the boom created by the C4 more than made up for the lack of flash. Even though everyone knew it was coming, the blast still caused more than one Soldier to jump.

After everyone had detonated C4, the Soldiers moved on to training with shaped charges and cratering charges, which are used to demolish construction or damage surfaces. All of the explosives had to be detonated before the unit could leave the demolition range. It was a long but beneficial day for the Soldiers.



Private First Class Samples is a member of the 350th Mobile Public Affairs Detachment, an Army Reserve unit from Indianapolis, Indiana.

Engineers Train As They Fight

By Specialist Matt Wisnieski

A Soldier first—that was the spirit instilled in United States Army Reserve Soldiers at NTC during Operation Sand Castle 2007. Soldiers trained to proficiently construct buildings, roads, and bridges, and along with that, they performed and succeeded in tactical training. The Reserve Soldiers traveled to Fort Irwin to upgrade existing facilities at NTC, the military's premier desert environment training center.

The Soldiers worked out of Forward Operating Base (FOB) Santa Fe, which was operated as if it were in a hostile area. Guards searched vehicles and also ensured the safety of Soldiers inside the wire. Outside the FOB, Soldiers wore full tactical gear, to include Kevlar helmets, body armor, ballistic eye protection, and individual weapons.

Because of the hot, dry weather, plenty of water was also part of the uniform, either in canteens or in Camelbak® hydration packs.



Vehicles leaving the FOB were treated as if they were in a combat zone as well. As a safety precaution, convoys were used to ensure that no Soldier went into the combat zone alone. In response to security alerts, convoys had to have at least four vehicles with two Soldiers in each of them. During convoy missions, they learned to react to improvised explosive devices (IEDs), and when vehicles were stopped during missions, they pulled security along the roadside.

Security was important in other situations as well. A combat engineer from the 671st Engineer Company pulled guard duty along with his team during a reconnaissance mission. While his battle buddies took measurements for a future bridging mission, the 671st Soldier and his team were in the prone position providing overwatch for safety. While construction was taking place, engineer Soldiers pulled guard at the work sites. The Opposing Forces (OPFOR) made sure that the Soldiers were always on their toes. Dummy IEDs and mortar attacks replicated real combat situations. Soldiers had to react to the explosions as if they were real, taking cover, accounting for their fellow Soldiers, and securing the area.

While at NTC, engineer Soldiers became more proficient at their military occupational specialties, and they also became better Soldiers.



Specialist Wisnieski is a member of the 362d Mobile Public Affairs Detachment, an Army Reserve unit from Londonderry, New Hampshire.



Constructing a Dry Support Bridge

By Specialist Matt Wisnieski and Private First Class Christine Samples

Two United States Army Reserve engineer companies from opposite sides of the country came together at NTC during Operation Sand Castle 2007. The 459th Engineer Company, a bridging unit from Bridgeport, West Virginia, brought a new dry support bridge (DSB) to replace the medium girder bridge (MGB) the unit had used in the past. The 671st Engineer Company, a bridging unit from Portland, Oregon, got a concentrated lesson from the 459th in constructing the new bridge.

The DSB can be constructed as two 20-meter bridges or a single 40-meter bridge. The 459th had set up the bridge only a few times in the past, but the situations were not tactical and

thus not very realistic. The NTC rotation was a great opportunity to use the new system in a realistically tactical setting.

While the old MGB was a very labor-intensive system, taking many Soldiers a long time to construct, the DSB uses a hydraulics system and a crane to take the place of manpower. A trained eight-Soldier crew can put up the bridge within three to five hours. The new bridge is a completely modular system, designed by the British for the U.S. Army. The system is on the high end of technological advancements for bridge construction, and because of its complexity, the company had a two-week training session with British instructors when it acquired the bridge more than two years ago. That session of hands-on training with the designers of the DSB was a great training experience for the Soldiers. The training was done at a deliberate pace so that nothing was forgotten; however, since that training took place so long ago, the NTC rotation was a good refresher.

The training for the 671st Engineer Company was more abbreviated. The unit had a month's class compressed into four days. The Soldiers learned the different personnel roles needed to construct the DSB. The system requires three Soldiers to set pins in the bridge to ensure that the modules stay connected. Two more Soldiers stand on top of the truck and help the crane operator with clipping and unclipping the modules. Two Soldiers are also needed to be "tag liners," to guide and balance the modules being moved by the crane operator.

The hands-on training was conducted deep in the middle of NTC over a large crevice so advancing convoys would have a safe passage. It took six hours of hard work under simulated combat conditions. The

A Soldier helps assemble a dry support bridge during Operation Sand Castle.



Photo by Specialist Matt Wisnieski

Photo by Specialist Mat Wisnieski



A 459th Engineer Company Soldier leads a truck across the dry support bridge that the company just set up.

Photo by First Class Christine Samples



Members of the bridge crew with the 671st Engineer Company begin the breaking-down process of their dry support bridge after it was tested with tactical traffic.

Soldiers were very methodical in setting up the bridge to ensure that no steps were missed. Once the DSB was tested with tactical traffic, the bridge crew dismantled it. The new bridge went back to West Virginia with the 459th, but the 671st will get its copy of the bridge as the Army continues to upgrade and improve its equipment.



Specialist Wisnieski is a member of the 362d Mobile Public Affairs Detachment, an Army Reserve unit from Londonderry, New Hampshire.

Private First Class Samples is a member of the 350th Mobile Public Affairs Detachment, an Army Reserve unit from Indianapolis, Indiana.

Operation Sand Castle



Photo by Specialist Matt Wisnieski

Engineers Light Up Firing Range

By Specialist Matt Wisnieski

As the convoy stopped, a hush fell over the nine Army vehicles. The reality of the situation set in as the four gun trucks tested their weapons systems. Soldiers looked forward a bit nervously to what lay before them. Ahead of the convoy was a city with more than a hundred enemy targets. Improvised explosive device (IED) attacks were expected. The Soldiers' task was to conduct a 20- to 30-minute assault on the city without injuring any civilians. Safety was the most important part of this mission. The Soldiers were technically proficient on their weapons and would need to rely on their training to get them through this assault. Suddenly, a cloud of dust washed over the convoy as it began to move.

The assault was on a live-fire range at NTC, as part of the Soldiers' three-week annual training during Operation Sand Castle 2007. They had been working hard under tactical conditions—constructing bridges, buildings, and roads—while others supported these missions. The culmination of the exercise was the two-day weapons training.

The first day was spent teaching Soldiers to operate the M-2 .50-caliber machine gun and the M-249 squad automatic weapon (SAW). The training was invaluable because during a deployment, any Soldier might need to use these weapons. The familiarization was important to maintain the safety not just of individuals but of entire units. After the familiarization classes, Soldiers fired live rounds from both weapons, including a ball and tracer mix from the M-2.

The second day was the real test. Soldiers shot both blank and live rounds from moving vehicles at targets on the live-fire range. The training gave Soldiers a good idea of how to engage the enemy from a moving convoy. The landscape of the realistic range was rocky and included plastic sheep, shopkeepers in their stores, and families in their homes. IEDs exploded at various distances from the convoy along the course. Throughout the town, enemy targets were in hiding or out in the open. It was a great training opportunity that taught Soldiers how to react in situations when force is needed.



Specialist Wisnieski is a member of the 362d Mobile Public Affairs Detachment, an Army Reserve unit from Londonderry, New Hampshire.

Photo by Specialist Matt Wisnieski



A combat engineer Soldier teaches his fellow Soldiers how to correctly operate and clear the M-2. The class was conducted in preparation for a live-fire training exercise at NTC.

Operation Sand Castle

ENGINEERS GO VERTICAL

By Private First Class Christine Samples

Alpha Company and Charlie Company, 458th Engineer Battalion, United States Army Reserve units out of Brookeville and Pittsburgh, Pennsylvania, learned new jobs during Operation Sand Castle 2007. The Soldiers of the two companies were tasked with building a number of pre-engineered buildings and concrete masonry unit (CMU) structures in three weeks. The challenge was that they had little or no experience with vertical construction before coming to NTC, because they were reclassifying from combat engineer military occupational specialties (MOSSs) to jobs that support vertical construction. The urban city, Medina Jabal, being built at NTC was their learning site.

A Soldier with Alpha Company, 458th Engineer Battalion, sets a cinder block down on fresh mortar on a CMU structure.

Operation Sand Castle gave the Alpha Company Soldiers a lot of tough training. With just four days to construct four CMU structures, the days started at about 0400. On some days, the Soldiers didn't get back to their forward operating base (FOB) until after the showers closed at 2300. That provided motivation for them to get their jobs done faster so they had time for hot showers.

The Soldiers didn't spend all their time building. Trips to and from the work site were delayed by attacks from the Opposing Forces (OPFOR) that were in place at NTC to help create a more realistic training environment. Before they started work for the day, the Soldiers also practiced clearing buildings that were already finished at the site. Clearing involved searching out hidden enemy forces and other hazards the OPFOR might have set up overnight.

Charlie Company engineers teamed up with the 461st Engineer Company out of Fargo, North Dakota, to begin working on a taped-off L-shaped area in the sand that would become a CMU structure. Since they had built roads during a deployment to Iraq, these Soldiers had experience in horizontal construction, but they too had never built structures that go up into the air.

The NTC training aimed to teach Soldiers what to expect during a deployment. The experience of those who had already been deployed was helpful when the company performed a convoy or pulled security, but their experience usually did not extend to vertical construction.

The transition of Alpha and Charlie Company's Soldiers to vertical engineer skills fits in with the Army's move to a more modular force. Engineer jobs are changing as the Army becomes more versatile and mobile. These Soldiers are taking the change in stride as they adapt and learn their new role in the Army.



Private First Class Samples is a member of the 350th Mobile Public Affairs Detachment, an Army Reserve unit from Indianapolis, Indiana.



Photo by Private First Class Christine Samples

Environmental Restoration Is Possible

By Dr. JoAnne Castagna

An eighth grade student from Elizabeth, New Jersey, stands on a pier and carefully lifts a starfish from a water-filled glass aquarium as her classmates surround her. She shrieks as one of its arms breaks off. A biologist with the United States Army Corps of Engineers® quickly assures her that the arm will grow back and that the creature will be okay. The starfish is finally placed safely in its natural habitat in the Hudson River Estuary.

Hudson-Raritan Estuary

The students were taking part in the fourth annual Earth Day celebration sponsored in April by the Corps and other agencies on the Elizabeth Marina City Dock. The

students learned that the nearby Hudson-Raritan Estuary, the starfish's home, could also be restored by keeping it pollution-free. It was a sunny, breezy day when more than 200 New Jersey students gathered on the dock overlooking the estuary. Corps experts explained to the students that an estuary is a partially enclosed coastal body of water with one or more rivers or streams flowing into it and with a free connection to the open sea.

Students learned about the effects of pollution on their environment from a number of Earth Day volunteers. They learned through a variety of interactive educational stations manned by scientific and educational experts. Glass touch tanks containing estuary marine life were featured, and demonstrations of pollution and water quality testing were conducted. The students also boarded a United States Coast Guard vessel for a tour and boarded the Corps vessel *Hocking* as it traveled near the estuary.

Aboard the *Hocking*, Corps experts discussed the estuary's rich history, current condition, and the Corps's ongoing port activities and environmental restoration projects in the estuary, four of which were recently completed with much success. The estuary covers 16,212 square miles and surrounds the Ports of New York and New Jersey in a region populated by 20 million people. For more than 200 years, the New York District has managed the port's navigation, development, and maintenance and is one of the Corps's largest civil works missions. Over the decades, the salt marshes along the shores of navigation channels have experienced some degradation and habitat loss due to a number of factors, including increased boat traffic and years of commercial construction and development along the



Photo by JoAnne Castagna, New York District, U.S. Army Corps of Engineers

Eighth grade students learn about starfish that live in the Hudson-Raritan Estuary.



Students board the *Hocking* for a tour of the estuary, where the Corps will be completing environmental restoration projects.

shore. To restore these areas, the Corps has an environmental restoration program in place. Maintaining the health of the estuary is important because salt marshes clean the water environment, reduce flood risks, and provide essential fish and wildlife habitats. Salt marshes are areas of land that are either covered by shallow water or contain waterlogged soil.

Salt Marsh Successes

In 2006, the New York District, in cooperation with the Port Authority of New York and New Jersey and state and local agencies, successfully completed four salt marsh restoration projects in the estuary that are preserving and restoring more than 143 acres of salt marsh.



Elders Point Island, Jamaica Bay, New York

Located in the boroughs of Brooklyn and Queens, the easternmost areas of New York City, is the Jamaica Bay Gateway National Recreation Area. It is a popular park visited by millions each year and home to a variety of wildlife species, including migratory birds and fish nurseries. Since colonial times, 90 percent of the Jamaica Bay marsh islands have degraded and the remaining acres of islands are disappearing at a rate of 44 acres per year. That rate has grown faster in the last decade. If the islands are not restored, they will be completely lost within the next three decades. The Corps is successfully restoring these islands, including Elders Point Island, which is composed of



The Corps restores a degraded salt marsh in Joseph P. Medwick Park on the Rahway River in New Jersey.

two separate islands—Elders Point East and Elders Point West—that are connected by mudflats. They totaled approximately 21 vegetated acres before the Corps's restoration. That restoration plan for Elders Point Island includes recontouring the land using dredged sand from various harbor channels and restoring the existing vegetation.

In the summer of 2006, 250,000 cubic yards of sand were pumped onto Elders Point East, and 700,000 plants were hand-planted, including salt marsh cordgrass, salt hay, and spike grass. Today, marsh grass is flourishing there, promoting the return of wildlife. The tentative schedule for Elders Point West is to place sand on the island next year and plant vegetation in 2009.

Keyspan, Staten Island, New York

One of the first salt marsh areas identified for restoration by the Corps was the nine acres of marsh adjacent to the Keyspan Corporation Facility in Staten Island, New York. In recent years, areas of the site have been overrun by an invasive species of common reed called *Phragmites australis*, which is a problem because its roots can grow very thick and high, preventing tidewater from penetrating the area frequently. Without a frequent tide, fish, shellfish, and other food sources for birds and mammals cannot exist.

The Corps removed the reed and 36,200 cubic yards of soil, graded the land to elevations suitable for native plants, and planted a diverse group of 107,000 native plants, including salt marsh cordgrass, salt hay, and marine shrubs. The plants provide a food source for fish and other marine life in the estuary and vegetation for nesting birds. Water flow to the area has been reestablished, improving the water and soil quality and promoting the return of native fish and wildlife.

Joseph P. Medwick Park, Rahway, New Jersey

The Corps decided to restore approximately 14 acres of salt marsh in the northern portion of Joseph P. Medwick Park along the southern shore of the Rahway River. Years ago, a berm

was built on the banks of the Raritan River, cutting off the site from the daily tide. As a result, the area was overrun by *Phragmites australis*. The reed prevented a normal tide of water from flowing into the site, degrading the site and adversely affecting its fish nurseries and the birds and wildlife that live and breed there. The Corps removed the reed and approximately 30,000 cubic yards of soil, recontoured the land, and planted 270,000 plugs of native wetland plants, including salt marsh cordgrass, salt hay, and marine shrubs. The plants provide a food source for fish and other marine life in the estuary and vegetation for nesting birds. Water flow to the area has been re-established, improving the water and soil quality and promoting the return of native fish and wildlife.

Woodbridge Creek Project, Woodbridge, New Jersey

Woodbridge Creek is a salt marsh with a diversity of vegetation and wildlife. In recent years, areas of the site have been overrun by *Phragmites australis*. As at the other sites, the reed prevented a normal tide of water, which has degraded the site and adversely affected its fish, bird, and wildlife habitats. The Corps restored approximately 23 acres of the marsh. In addition, approximately 8 acres adjacent to the site were restored in cooperation with the National Oceanic and Atmospheric Administration and the New Jersey Department of Environmental Protection. These additional acres helped to restore the land adversely affected by a 1990 oil spill. The restoration included removing soil from within the marsh, grading the land to make it suitable for native marsh vegetation to flourish, and replanting more than 240,000 marsh plants. The plants provide a food source for fish and other marine life in the estuary and vegetation for nesting birds. The project has restored the water flow to the site and now juvenile fish species are creating nurseries there, and bird and wildlife habitats are returning to the site.

Future Environmental Leaders

The Earth Day celebration was a great opportunity to energize the students, our future environmental leaders, about the health of their own estuary in the New York and New Jersey Harbor and help them understand the connection between land and water. It was an important part of the effort to encourage public support to maintain this resource as a world-class estuary.

For additional information about the New York District's Hudson-Raritan Estuary Program, visit <http://www.nan.usace.army.mil/harbor/index.htm>.



Dr. Castagna is a technical writer-editor for the United States Army Corps of Engineers, New York District. She can be reached at <joanne.castagna@usace.army.mil>.



New Well-Drilling Rig Arrives In Djibouti

By Captain Jerord E. Wilson


It was like a prayer being answered when an eagerly awaited new well-drilling truck arrived at Camp Lemonier in Djibouti in May 2007 to be used by the 1132d Engineer Detachment. The North Carolina Army National Guard unit, working as part of the Combined Joint Task Force–Horn of Africa (CJTF–HOA), accepted the rig and performed preventive maintenance checks and services (PMCS) to identify any mechanical problems with the system and prepare the equipment for the difficult conditions it would face in Djibouti.

In the past, well-drilling equipment took a long time to set up and, because of the thick geological structure of the rock formations in Djibouti, the equipment was subject to severe maintenance problems. Those problems delayed the creation of much-needed wells because repair parts had to be ordered from the United States. The capabilities of the new equipment are impressive. It travels with two large trucks, and the drill can reach depths of more than 2,000 feet. It can use either 6- or 12-inch steel roller cone drill bits designed to chew through the toughest geological formations in Djibouti.

The new well-drilling truck is manufactured by the Laibe Corporation, Indianapolis, Indiana. A representative from the company spent several weeks at Camp Lemonier to train members of the 1132d on the equipment. Temperatures in Djibouti can reach 100 degrees by midmorning, and the increase

in temperatures could have some effect on the operation of the equipment. The crew operating the new machine will have to take precautions against the effects of the heat on the equipment and on themselves as operators.

Previously, the equipment used by the 1132d took about a week to set up before drilling could even begin. To drill 100 feet with the old drilling rig could take a considerable length of time, depending on soil composition. The new drilling equipment can be set up and ready to drill in just one day. Also, the new rig can drill 100 feet in five hours, even in the toughest soil in Djibouti, increasing the number of wells that can be drilled at locations throughout the country.

The mission of CJTF–HOA is to prevent conflict, promote regional stability, and protect coalition interests in order to prevail against extremism. The CJTF–HOA organization began operations at Camp Lemonier on 13 May 2003. It works with partner nations on humanitarian assistance; disaster relief; consequence management; and civic action programs, to include medical and veterinary care, school and medical clinic construction, and water development projects. 

Captain Wilson worked for the CJTF–HOA civil-military operations section until July. He is now back in the United States.

2007 Army Deployment Excellence Awards



By Mr. Henry H. Johnson

The Army's 2007 Deployment Excellence Award (DEA) winners received top honors and presentations from Lieutenant General James L. Campbell, Director of the Army Staff, on 5 June 2007, at the 3d Annual Chief of Staff Army, Combined Logistics Excellence Award Ceremony/Banquet hosted by Lieutenant General Ann E. Dunwoody, the Army's Deputy Chief of Staff, G-4, at the Hilton Alexandria Mark Center Hotel, in Alexandria, Virginia.

Lieutenant General Campbell congratulated the awardees on their outstanding achievement on behalf of General George W. Casey, the Army's Chief of Staff, before delivering the keynote address to an audience of congressional dignitaries, senior Army generals, senior executive civilians, and a host of Family members, Soldiers, and friends.

The DEA program is open to all Active Army, United States Army Reserve, and Army National Guard units or table of organization and equipment (TOE), table of distribution and allowances (TDA), or fixed military installations with a deployment or deployment support mission. Units and installations compete in one of five categories: large unit (battalion and above), small unit (company and below), supporting unit, installation, and operational deployment.

The *deploying unit category* recognizes units that have demonstrated the ability to actually conduct a deployment as evidenced in their nomination packet and verified by an on-site evaluation team. This category consists of two subcategories—a *large-unit category* for battalion-size units and above and a *small-unit category* for company-size units and below.

The *supporting unit category* recognizes units that have demonstrated the ability to support an actual deployment, as evidenced in their nomination packet and verified by an on-site evaluation team. Finally, the *installation category* recognizes fixed military installations or installation commands that have demonstrated the ability to support an actual deployment, as evidenced in their nomination packet and verified by an on-site validation/evaluation team. Units and installations prepare and submit self-nomination packets through command channels to their appropriate major command, where panels will select the best. The major commands send their nominations to a Department of the Army (DA)-level evaluation board conducted at Fort Eustis, Virginia. The DA DEA Board reviews and scores the nominations and determines semifinalists. DEA teams of deployment specialists

visit the selected semifinalist organization locations for an on-site firsthand validation of unit deployment practices.

"I'd like to just say a few things about all of you award winners out there and the thousands of Soldier and civilian logisticians you represent. ... Actually, to be in the midst of the Soldiers and civilians who have received the equivalent of the Nobel Prize in logistics is pretty awesome. It's not every day that you are surrounded by some of the Army's finest logisticians and the best supporters in the world. ... Hooah!" – MG Stevenson

The *operational deployment category* recognizes large (battalion and above) and small (company and below) units for short-notice deployments in support of operational missions like the War on Terrorism, peacekeeping, or humanitarian relief operations, which is different from the program's original categories, in that units do not submit nomination packets but are instead evaluated on-site by a DEA observation team.

"It's not about the general who is out there in the sand and mud making the critical decisions at the point of the spear. It is ... and always has been, Soldiers and civilians, like you, that have gone beyond the call of duty to hone their tactical and technical skills ... building a strong foundation from which leaders can base future decisions—decisions which often have life and death consequences." – MG Stevenson

The DEA winners and runner-up unit commanders received the Army Chief of Staff's Star Note, distinguished plaque, and a distinguished shadow box with the Chief of Staff of the Army; the Sergeant Major of the Army; the Army Deputy Chief of Staff, G-3; the Army Deputy Chief of Staff, G-4; and the Chief of Staff Army Combined Logistics Excellence Award coins encased in a plush leatherette display box commemorating the unit's accomplishment. The unit awardees received a Star Note signed by the Deputy Chief of Staff, G-4; a three-night stay in the luxury Hilton Alexandria Mark Center Hotel and tours of the Pentagon, the Capital, and other places of interest in the Washington, D.C., area and received VIP guest seating at the "Twilight Tattoo"—a colorful military pageant held at the Jefferson Memorial. The awardees' celebration concluded with a banquet hosted by the Army Deputy Chief of Staff, G-4, in their honor that included the keynote speaker—Major General Mitchell H. Stevenson, Commanding General, United States Army Combined Arms Support Command and Fort Lee—and entertainment provided by the United States Army Chorale.

2007 Deployment Excellence Award Recipients

Category	Winner	Runner-Up
Active Large Unit	526th Brigade Support Battalion 2d Brigade Combat Team 101st Airborne Division (Air Assault) Fort Campbell, Kentucky	21st Combat Support Hospital Fort Hood, Texas
Active Small Unit	Headquarters and Headquarters Detachment 30th Signal Battalion Schofield Barracks, Hawaii	D Company, 7th Battalion 101st Aviation Regiment Fort Campbell, Kentucky
Active Support Unit	841st Transportation Battalion Charleston, South Carolina	838th Transportation Battalion Rotterdam, Netherlands
Army Reserve Large Unit	1188th Transportation Terminal Battalion Decatur, Georgia	1185th Transportation Terminal Brigade Lancaster, Pennsylvania
Army Reserve Small Unit	362d Tactical Psychological Operations Company Fayetteville, Arkansas	322d Maintenance Company Arden Hills, Minnesota
Army Reserve Support Unit	1190th Deployment Support Brigade Baton Rouge, Louisiana	1394th Deployment Support Brigade Camp Pendleton, California
National Guard Large Unit	53d Infantry Brigade Combat Team Pinellas, Florida	41st Infantry Brigade Combat Team Tigard, Oregon
National Guard Small Unit	B Company, 2d Battalion 218th Field Artillery Regiment McMinnville, Oregon	A Company, 1st Battalion 186th Infantry Regiment Medford, Oregon
National Guard Support Unit	Joint Forces Headquarters-Florida St. Augustine, Florida	Joint Forces Headquarters-Minnesota Little Falls, Minnesota
All Army Installation	Fort Bragg, North Carolina	Fort Hood, Texas
Operational Deployment Large Unit	Brigade Troops Battalion, 1st Brigade Combat Team, 3d Infantry Division Fort Stewart, Georgia	NA
Operational Deployment Small Unit	A Company, 15th Brigade Support Battalion 2d Brigade Combat Team, 1st Cavalry Fort Hood, Texas	NA

“The 21st century necessitates a highly versatile Army that can handle a diverse array of operations and missions, and so I encourage, and challenge, each of you in this room to continue the extraordinary work that clearly has set you apart from your peers.” – MG Stevenson

The DCSLOG memorandum /letter of instruction (LOI) dated 19 April 2000, on the DEA website, outlines the DEA awards criteria and guidance. The DEA LOI contains detailed guidance/instructions for competing units and installations. The DEA checklist is an appendix to the LOI (pending release of AR 525-30, later this year). This guidance is available in Microsoft Word® format for online viewing or downloading from the DEA website at <http://www.eustis.army.mil/deploym>.

Significant dates for the 2008 competition are as follows:

- 1 December 2006 - 30 November 2007: Competition period; submit packets through command channels to major commands.
- 31 January 2008: Major commands' nomination packets are due to the DEA Program Manager.

- 4-15 February 2008: DEA Board convenes to evaluate unit packets and select semifinalists.
- 3-26 March 2008: DEA teams visit selected semifinalists' locations and conduct on-site validation of deployment and deployment support practices.
- April 2008: Winners announced via DA message.
- June 2008: DEA awards are presented at the Chief of Staff, Army Combined Logistics Excellence Award Ceremony/ Banquet, Washington, D.C.

For additional information, contact the DEA Program Manager, ATTN: Mr. Henry Johnson, Building 705, Room 215, Fort Eustis, Virginia 23604, DSN 826-1833 or commercial (757) 878-1833.



Mr. Johnson, a retired command sergeant major, is the Deployment Excellence Award Program Manager at the Deployment Process Modernization Office, Fort Eustis, Virginia.

War Trophies of the Past

By Mr. Garry Hollands and Mr. Wil Nelson

The role of the United States Army combat engineer usually gains little press coverage, while the infantry and armor Soldiers often gather accolades for their endeavors. However, thirty-eight years ago in Vietnam, American combat engineers were engaged in the largest and most successful combat engineering feat of that long-ago war—one that tested all their skills and ingenuity and brought them recognition—Operation Horace Greeley. The operation involved the construction of Route 547—also known as the A Shau Expressway—from Hue across the steep jungle-covered mountains of the Ammonite Cordillera and into the infamous A Shau Valley.

The North Vietnamese Army (NVA) had captured the A Shau Valley in 1966, driving out the United States Special Forces from their camps at A Luoi, Ta Bat, and A Shau. Attempts by the 1st Cavalry Division, and then by the 101st Airborne Division (Air Mobile), to retake the Valley first failed in 1968, primarily due to poor weather. Lieutenant General Richard Stilwell, commander of XXIV Corps, and whose area of responsibility was I Corps Tactical Zone (the five northernmost

provinces of South Vietnam), determined that an all-weather road would be constructed to bring armor, tracked artillery, and supplies to support infantry actions sweeping the Valley. To achieve this tactical necessity, engineers of the 45th Engineer Group, 18th Engineer Brigade were gathered in March 1969 to form Task Force Tiger. Led by the 27th Engineer Battalion (Combat) out of Gia Le Combat Base, south of Hue, the task force also included the following units:

- 59th Engineer Company (Land Clearing)
- 511th Engineer Company (Panel Bridge)
- 591st Engineer Company (Light Equipment)
- 630th Engineer Company (Light Equipment)
- C Company, 1st Engineer Battalion, Army of the Republic of Vietnam (ARVN)
- 2d Platoon, A Company, 14th Engineer Battalion (Combat)
- D Company, 14th Engineer Battalion (Combat)
- 1st Equipment Platoon, D Company, 87th Engineer Battalion (Construction)



This 85-millimeter ammunition was discovered while clearing the jungle beside Route 547 in Vietnam.



Soldiers display a Russian 85-millimeter field-piece captured near FSB Blaze.

The task force's mission was to—

- Construct 55 kilometers of Route 547, a heavy-duty, two-lane, all-weather road from Fire Support Base (FSB) Bastogne to FSB Blaze, and a one-lane, all-weather road to FSB Rendezvous in the A Shau Valley.
- Construct necessary bridging.
- Construct two FSBs.
- Make tactical improvements to Route 548 in the A Shau Valley.

Operation Horace Greeley supported the 101st Airborne Division's Operation Massachusetts Striker and Operation Apache Snow, which included the infamous battles of Dong A Tay (Bloody Ridge) and Dong Ap Bai (Hamburger Hill). The engineers began Operation Horace Greeley on 20 March 1969 and constructed the road to allow the armor of the 3d Squadron, 5th Cavalry Regiment, to reach the Valley in May. Operation Horace Greeley officially ended on 29 September 1969, in preparation for the monsoon season.

A critical part of the road construction was the clearing of the jungle for 200 meters on both sides of the road to help prevent ambushes. The 59th Engineer Company (Land Clearing), with its 30 Rome plows, accomplished this portion of the mission. In doing so, the Rome plows uncovered large amounts of enemy equipment, bunkers, ammunition, and weapons. Numerous small trucks, most of them destroyed by earlier air attacks, were also uncovered. While clearing vegetation along Route 458 in the A Shau Valley, the 59th discovered a Russian bulldozer that the NVA had abandoned when it fled the Valley in May 1969. The dozer had a broken


clutch, so the Soldiers towed it along the perilous one-lane road carved through the steep mountains from FSB Rendezvous to FSB Cannon. There it was placed on a low-boy trailer and hauled back to Gia Le. This dozer was of American design but had been manufactured in a factory shipped to Russia during World War II as part of the Lend-Lease Program.

Back at Gia Le, the dozer was repaired and made operational. (See sidebar, page 42.) The dozer's clutch throwout bearing was replaced with one from a five-ton dump truck. That replacement would not be surprising, given the Army's habit of using common parts in many vehicles over a long period of time. That the dozer was an exact replica of an American Lend-Lease dozer was evident from the numerous nameplates copied on various parts of the equipment, including one on the right-hand side of the engine block. The casting duplicated everything—including the fasteners that secured the plate to the engine block—except the lettering and numbering on the nameplate.

Of more significance was the discovery in the Rao Ninh Valley of three buried Russian 85-millimeter artillery pieces, complete with cleaning equipment and ammunition. Buried nearby were three small stake-bed trucks that may have been used to pull the artillery. It was rumored that these cannons were loaded and a few rounds sent into Laos. At that time, these were the first artillery pieces captured by engineer Soldiers since World War II. One of these guns was shipped by Major General William T. Bradley, then commander of United States Army Engineer Construction Agency, Vietnam, to Fort Leonard Wood, Missouri, where



Engineers inspect a Russian bulldozer captured in the A Shau Valley.

These young men operated their powerful machines on dangerously steep slopes, pushing down vegetation full of poisonous snakes, stinging insects, and occasional mines and snipers. They pulled guard duty every night, then went out each morning and worked all day in the oppressive heat, risking their lives at every turn. 

Mr. Hollands, a first lieutenant during his tour in Vietnam, was the battalion intelligence

it is on display at the Engineer Museum. Another was lost en route to Fort Belvoir, Virginia, and the third was presented to the mayor of Hue. It was probably recaptured by the NVA when Hue fell in 1975.

Of the many heroes of the Vietnam War, the combat engineers who drove the Rome plows stand out near the top.

officer until June 1969. Then he served as a platoon leader and the executive officer of C Company, 27th Engineer Battalion (Combat).

Mr. Nelson, who was a captain, served as the 27th Engineer Battalion maintenance officer from mid-January to mid-December 1971.

Bamboo to Blue:


Army Engineers in Vietnam Refurbish a Captured Bulldozer

By Mr. Harold Walden

In 1969, a new engineer equipment mechanic was assigned to the maintenance section of the 27th Engineer Battalion (Combat) at Gia Le, near Hue in South Vietnam. While constructing Route 247, American Soldiers happened upon an abandoned Russian-made bulldozer in the A Shau Valley. One of the battalion's lowboy trailers brought the little dozer—about the size of a Caterpillar D6—into the maintenance driveway, where it was off-loaded. A former operator had constructed bamboo-and-leaf additions to make the bulldozer more comfortable. It was surprising that anyone could have spotted the camouflaged machine in the middle of dense forest.

The new Soldier, just a couple months out of mechanic school, was designated to work with a more seasoned mechanic to refurbish the dozer. Immediately, they began to undo all of "Charlie's" skilled bamboo home improvements. Although the Russian manufacturers used metric nuts and bolts, the Soldiers made their tools work. They did extensive rebuilding of the gasoline pony motor used to start the diesel engine. They replaced the clutch with one from a

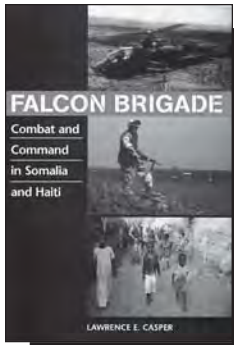
five-ton dump truck, installed new batteries and a starter, cleaned the fuel injectors and fuel pump, lubricated all the zerk fittings, and changed all the fluids and filters. Finally, they tightened the track. They cranked up the pony motor and engaged the clutch. To their amazement, the bulldozer started up and ran.

The warrant officer who supervised the maintenance operation wanted to make a big impression on the battalion commander, so he got some powder blue paint and the bulldozer got a shiny new coat. When a new battalion commander arrived soon after, the captured equipment played a special role. The outgoing commander reviewed the troops from atop the powder blue dozer, while the lead mechanic drove his pride and joy. 

Mr. Walden was a private first class fresh from mechanics training at the United States Army Engineer School at Fort Belvoir, Virginia, when he helped salvage the captured bulldozer at Gia Le.

Book Review

Falcon Brigade: Combat and Command in Somalia and Haiti, by Lawrence E. Casper (Colonel, USA, Retired). Lynne Rienner Publishers: Boulder, Colorado, 2001, 278 pages, ISBN: 978-1-55587-945-7, \$35.00 (hardcover)



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Falcon Brigade covers the United States involvement in two modern military operations—Somalia and Haiti. These actions were in the “new” era of military commitments that involve “nation building” and intervention aimed at stabilizing regions rather than straightforward military ends. This work describes what it is like to be in command of a combat unit in this scenario.

Casper’s tour as the Falcon Brigade (Aviation Brigade, 10th Mountain Division) commander during these two deployments provides us with a unique comparison between the interventions in Somalia and in Haiti. He shows us the stark contrast between the misguided, underarmed, underarmored, and uncoordinated United Nations

efforts in Somalia and the overwhelming application of force used to quickly restore order in Haiti.

Anyone who has read *Black Hawk Down*, about the 3 October 1993 battle in Mogadishu, knows that it was a horrific action that was saved from complete disaster only by the discipline, esprit, and training of those who fought. Casper brings a unique perspective to that battle. As the Quick Reaction Force commander, he literally overflowed the battle as it raged.

Then just six months after returning from Somalia, Casper and the Falcon Brigade were aboard the *USS Eisenhower*, preparing to air-assault the 10th Mountain Division troops onto the shores of Haiti during Operation Uphold Democracy. Casper recounts the frustrations and challenges of brigade Soldiers working around the clock for thirty days.

This is an outstanding book, strongly recommended for professional development and informative reading for students of modern military operations. Written by one who was there, Casper shares many leadership lessons learned as well as giving a Soldier’s perspective of what happened.

Reviewed by Mr. Jeffrey L. Rosemann, an Instructional Systems Specialist with the Officers Training Development Division, Department of Instruction, United States Army Engineer School. A retired infantry Soldier, Mr. Rosemann also served as the 2d Infantry Division historian during the beginning of the 50th Anniversary of the Korean War.

• • • • • The Engineer Writer’s Guide • • • • •

Engineer is a professional-development bulletin designed to provide a forum for exchanging information and ideas within the Army engineer community. We include articles by and about officers, enlisted Soldiers, warrant officers, Department of the Army civilian employees, and others. Writers may discuss training, current operations and exercises, doctrine, equipment, history, personal viewpoints, or other areas of general interest to engineers. Articles may share good ideas and lessons learned or explore better ways of doing things.

Articles should be concise, straightforward, and in the active voice. If they contain attributable information or quotations not referenced in the text, provide appropriate endnotes. Text length should not exceed 2,000 words (about eight double-spaced pages). Shorter after-action-type articles and reviews of books on engineer topics are also welcome.

Include photos (with captions) and/or line diagrams that illustrate information in the article. Please do not include illustrations or photos in the text; instead, send each of them as a separate file. Do not embed photos in PowerPoint. If illustrations are in PowerPoint, avoid excessive use of color and shading. Save digital images at a resolution no lower than 200 dpi. Images copied from a website must be accompanied by copyright permission.

Provide a short paragraph that summarizes the content of the article. Also include a short biography, including your full name, rank, current unit, and job title; a list of your past

assignments, experience, and education; your mailing address; and a fax number and commercial daytime telephone number.

Articles submitted to *Engineer* must be accompanied by a written release by the author’s unit or activity security manager prior to publication. All information contained in the article must be unclassified, nonsensitive, and releasable to the public. *Engineer* is distributed to military units worldwide and is also available for sale by the Government Printing Office. As such, it is readily accessible to non-government or foreign individuals and organizations.

We cannot guarantee that we will publish all submitted articles. They are accepted for publication only after thorough review. If we plan to use your article in an upcoming issue, we will notify you. Therefore it is important to keep us informed of changes in your e-mail address and telephone number. All articles accepted for publication are subject to grammatical and structural changes as well as editing for style.

Send submissions by e-mail to <leon.engineer@conus.army.mil> or on a 3 1/2-inch disk or CD in Microsoft Word, along with a double-spaced copy of the manuscript, to: Managing Editor, *Engineer Professional Bulletin*, 364 MANSCEN Loop, Suite 2661, Fort Leonard Wood, Missouri 65473-8926.

Note: Please indicate if your manuscript is being considered for publication elsewhere. Due to the limited space per issue, we usually do not print articles that have been accepted for publication by other Army professional bulletins.



Engineer Update

Transition from ARTEP/MTPs to CATS. The U.S. Army has transitioned from using the Army Training and Evaluation Program (ARTEP) mission training plans (MTPs) as a collective training tool to using the combined arms training strategy (CATS). A CATS is a unit training strategy which, as an entity, takes the entire training planning process from the cradle to the grave. A CATS is developed from a unit's base table of organization and equipment (TOE) and Department of the Army-approved mission statement. They are designed using the training model of crawl-walk-run. Commanders will make the final determination as to which tasks should be trained and at what level the training should begin, since they will know their unit's training status. Included in CATS are the required training resources such as Class III and Class V materials and training aids, devices, simulators, and simulations (TADSS). The current ARTEP/MTPs that are located on the Reimer Digital Library (RDL) are scheduled

to be removed from the RDL (TBD). CATS are located on Army Knowledge Online (AKO) on their own dedicated page. The planned end state is movement of CATS to the Digital Training Management System (DTMS) once it is fully fielded. Additionally, the Collective Training Division of the United States Army Engineer School developed a website on the Engineer Portal that will also have links to CATS and files available for download. The following links will take you to the AKO CATS site and to the Engineer Portal.

AKO CATS Link: <<https://Army Knowledge Online>>.

Engineer Portal Link: <<https://www.mwu.army.mil/portal/eng/index.php>>.

The point of contact at the Engineer School Collective Training Division is <donald.durst@us.army.mil> or call (573) 563-6237.

Engineer Doctrine Contact Update. As of 15 August 2007, the Engineer School's Doctrine Division was consolidated at the Maneuver Support Center (MANSCEN) level to the MANSCEN Directorate of Training (MDoT) Doctrine Division. The Engineer Doctrine element still retains the lead for the Regiment's doctrine with only a few minor changes in physical locations and contact information.

The mailing address for written correspondence has changed to: Commandant, United States Army Engineer

School, ATTN: ATZT-TDD-E, 320 MANSCEN Loop, Suite 220, Fort Leonard Wood, Missouri 65473-8929.

The telephone numbers remain the same: Doctrine Chief, (573) 563-8161; Senior Doctrine Analyst, (573) 563-7332 (DSN prefix, 676-).

The generic NIPR e-mail address for electronic correspondence has changed to <leon.mdotteddengdoc@conus.army.mil>.

Engineer School Lessons Learned Integration (L2I) Cell. The United States Army Engineer School L2I Cell needs your help. To keep training, doctrine, and combat developments current and to prepare for the future, it is critical that the school continuously receive relevant engineer observations, insights, and lessons (OIL). The L2I analyst can derive information from a variety of sources: unit after-action reports (AARs); tactics, techniques, and procedures (TTPs) used by units in and returning from theater; Soldier observations/submissions to the Engineer School; and requests for information (RFIs). This information is used to conduct doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) gap analyses and to determine

solutions. These solutions are distributed to the Engineer Regiment via new doctrine and training products, *Engineer* (The Professional Bulletin of Army Engineers) and other publications, websites, and by answering RFIs. With the modular transformation in full swing, many engineer units are looking for sample tactical standard operating procedures (TACSOPs) for the new units being established. You can help by forwarding any of these materials from your unit's deployment to the L2I analyst. Unclassified information can be sent to <paul.a.zacher@us.army.mil>. Classified information can be sent by secure Internet protocol, routed (SIPR) e-mail to <paul.a.zacher@us.army.smil.mil>. For more information, call (573) 563-5340.

2007 Engineer Unit Directory. The 2007 United States Army Engineer Unit Directory is available online in Adobe PDF format at <<http://www.wood.army.mil/engrmag/Engr%20Unit%20Dir/2007Directoryonline.pdf>>. Since

many unit addresses have changed recently, take a moment and see if your unit's listing is correct. Changes to the Unit Directory can be made by calling (573) 563-7644 or e-mailing <leon.engineer@conus.army.mil>.

Operation Iraqi Freedom

