ENGINEER

The Professional Bulletin of Army Engineers

July-September 2005

Urban and Complex Terrain

Headquarters, Department of the Army
PB 5-05-3 Approved for public release, distribution is unlimited

United States Army Engineer School
573-563-8080 / DSN 676-8080

COMMANDANT
MG Randal R. Castro
563-6116
<randal.castro@us.army.mil>

ASSISTANT COMMANDANT
COL(P) Todd T. Semonite
563-6192
<todd.semonite@us.army.mil>

REGIMENTAL COMMAND SERGEANT MAJOR
CSM Clinton J. Pearson
563-8060
<clinton.pearson@us.army.mil>

DEPUTY ASSISTANT COMMANDANT
COL Lou L. Marich
563-8080
<lou.marich@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–USAR
COL Gerald Lago
563-8045
<gerald.lago@us.army.mil>

DEPUTY ASSISTANT COMMANDANT–ARNG
LTC Dennis V. Smith
563-8046
<dennis.v.smith@us.army.mil>

CHIEF OF STAFF
LTC Anthony C. Funkhouser
563-7116
<anthony.funkhouser@us.army.mil>

TRADOC SYSTEMS MANAGER for ENGINEER COMBAT SYSTEMS
COL Robert Nicholson
563-4081
<robert.nicholson@us.army.mil>

TRADOC PROGRAM INTEGRATION OFFICE–TERRAIN DATA
COL Thomas Crabtree
329-1908
<thomas.crabtree@us.army.mil>

COMMANDER, 1st ENGINEER BRIGADE
COL Joseph Schweitzer
596-0224, DSN 581-0224
<joseph.schweitzer@us.army.mil>

DIRECTOR OF TRAINING AND LEADER DEVELOPMENT
COL Paul W. Kelly
563-4093
<paul.w.kelly@us.army.mil>

DIRECTOR OF ENVIRONMENTAL INTEGRATION
Dr. Rebecca Johnson
563-4129
<rebecca.johnson1@us.army.mil>

DIRECTOR OF FUTURES CENTER - ENGINEER
COL Richard M. Hornack
563-7955
<richard.hornack@us.army.mil>

HUMANITARIAN DEMINING TRAINING CENTER
Mr. Rodney A. Robideau
596-3870
<rodney.a.robideau@us.army.mil>

COUNTER EXPLOSIVE HAZARDS CENTER
LTC Kent D. Savre
593-4085
<kent.savre@us.army.mil>

By Order of the Secretary of the Army:
PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

Sandra R. Riley
Administrative Assistant to the
Secretary of the Army
06101

Engineer (ISSN 0046-1989) is published quarterly by the United States Army Engineer School, 320 MANSCEN Loop, Suite 348, Fort Leonard Wood, Missouri 65473-8929. Periodicals postage is paid at Fort Leonard Wood, Missouri, and additional mailing offices.

POSTMASTER: Send address changes to United States Army Engineer School, ATTN: ATSE-DP *(Engineer)*, 320 MANSCEN Loop, Suite 348, Fort Leonard Wood, Missouri 65473-8929.

CORRESPONDENCE, letters to the editor, manuscripts, photographs, official unit requests to receive copies, and unit address changes should be sent to *Engineer* at the preceding address. Telephone: (573) 563-4104, DSN 676-4104; *e*-mail address: *<engineer@wood.army.mil>;* Internet home page: *<http://www.wood.army.mil/engrmag/default.htm>.*

OFFICIAL DISTRIBUTION is targeted to all engineer and engineer-related units.

PERSONAL SUBSCRIPTIONS are available for $19.00 ($26.60 foreign) per year by contacting the Superintendent of Documents, P.O. Box 371954, Pittsburgh, Pennsylvania 15250-7954.

ADDRESS CHANGES for personal subscriptions should be sent to the Superintendent of Documents, ATTN: Mail List Branch, Mail Stop SSOM, Washington D.C. 20402.

ENGINEER

The Professional Bulletin of Army Engineers

July-September 2005 | Headquarters, Department of the Army | *Volume 35 PB 5-05-3*

Front Cover:

U.S. Army engineer Soldiers in urban and complex terrain - then and now.

Back Cover:

Sergeant First Class Paul R. Smith, Medal of Honor recipient

FEATURES

DEPARTMENTS

Clear The Way

By Major General Randal R. Castro
Commandant, United States Army Engineer School

Welcome to our latest issue of *Engineer*. Greetings to all of you who are serving from all around the globe. And thank you for taking the time to sit with us and read the latest experiences from the great Soldiers in our Regiment. Each of you performs a vital job across the force, and I want you to know I appreciate the role each of you plays in making the Army function from day to day. Without you, we could not accomplish all that we have. I want to thank you all for what you do for our Regiment and our country.

As we approach four years of fighting the Global War on Terrorism, we are busy as ever, trying to synchronize major events for our Army and the Engineer Regiment. I know most of our engineers are either deploying, deployed, or recently deployed. Many of you will also be a part of the Base Realignment and Closure (BRAC) reorganization and Integrated Global Presence and Basing Strategy, which will move forward-stationed units to CONUS-based posts. While we do all these deployments and movements between installations, we are going to use this inertia to transform the Regiment in conjunction with the Army's efforts to modularize into brigade combat teams (BCTs), units of employment-tactical (UEx), and units of employment-operational (UEy). We received great news recently that the Vice Chief of Staff of the Army approved the Future Engineer Force Update. It is a significant event for our Army and will require everyone's efforts to accomplish.

Now more than ever, we have the ability to keep you informed on what is happening around the Regiment. I have spoken to you all recently on a number of subjects that can be found on our Engineer School Web site at <*http://www.wood.army.mil/eschool/*>. Another tool that we are leveraging to provide you relevant information is "The Engineer Blast." It is a bimonthly e-mail newsletter that provides current news and updates throughout the Regiment. If you have not seen it, ask your unit leadership to pass it down to you.

This issue is focused on engineer operations in urban and complex terrain. It is one of our greatest challenges in theater today, and we must become proficient in understanding assured mobility in this environment. We have had some great articles from the folks that are making things happen. We will continue to address this subject at our Army Engineer Association Conference, 24-27 October 2005, in Orlando, Florida. I look forward to seeing our Regiment's leadership there to share their experiences and lessons learned. I want to take your feedback and return to the Engineer School and spiral your ideas into our doctrine and lesson plans for our Soldiers and young leaders.

We want to continue making this a viable and relevant professional bulletin. Continue to submit your articles and share your experiences and lessons learned with the Regiment.

As I close this message, I ask you to take a deep breath, let it out slowly, and relax. Don't forget what is important…I want you to remain balanced in your lives, contribute to your team of teams, and passionately make a positive difference wherever you serve.

Thanks again for all you do for our Regiment and the Army! *Essayons!*

Carry On!

• • • • • • • • •

The back cover of this issue of *Engineer* and the poster in the center are a tribute to Sergeant First Class Paul Ray Smith, an engineer Soldier and the recipient of the first Medal of Honor for service during Operation Iraqi Freedom and the Global War on Terrorism. Sergeant Smith, whose selfless service to his country was the epitome of the Warrior Ethos, has brought great honor to the Army and to the Engineer Regiment.

Lead The Way

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

I would like to begin by saying thanks for the great work by all of the great sappers across the globe. I'd also like to extend a warm welcome to the new leaders within the Engineer School. What a super team we have!

During my travels throughout the previous quarter, I witnessed officers, noncommissioned officers (NCOs), and Soldiers doing an outstanding job supporting our nation and our Army at war. In June, for example, I participated in training with students of the Urban Mobility Breaching Course (UMBC) at Camp Lejeune, North Carolina. The details of this course are in the Engineer Update on page 38. I am soliciting your help to send as many NCOs as possible to the UMBC.

Another course I ask you to support is the Explosive Ordinance Agent Course (EOAC) at Redstone Arsenal, Alabama. In this course, students learn to identify, categorize, and destroy captured enemy ammunition (CEA), improvised explosive devices (IEDs), and unexploded ordnance (UXO). It bridges the gap between explosive ordnance disposal (EOD) personnel and engineers.

Three courses offered here at Fort Leonard Wood are the Sapper Leader Course and the Unit Searcher and Unit Search Advisor Courses. These courses help produce some of our Army's best small-unit leaders and greatly improve their ability to operate in an urban environment.

Just two years ago, the only specialized course offered by the Engineer Regiment was the Sapper Leader Course. Today, we present a myriad of courses. It is imperative that we continue to send Soldiers to these courses. I have talked to many leaders and Soldiers in the field who stated that these courses are making a difference in their confidence and ability to perform their wartime missions.

I also participated in training with our engineer divers in Delta Company, 577th Engineer Battalion, at Panama City, Florida. I was thoroughly impressed by the extensive training students go through to become divers. Soldiers attend Phase I of the training at Fort Leonard Wood and Phase II at the Naval Diving and Salvage Training Center at Panama City. This training requires a tremendous amount of mental and physical endurance. It is demanding and challenging and definitely prepares divers to conduct their wartime and peacetime missions. If you have Soldiers interested in becoming engineer divers, visit the 577th's Web Site at <*http://www.wood.army.mil/577th/Diver/index.htm*> for information.

During August, I attended the 130th Engineer Brigade off-site in Germany. I visited the 1st Armored Division and 1st Infantry Division engineer units and learned about the challenges they're facing regarding transformation. I'm confident that we have the right command teams, at the right place, at the right time to get the job done. It was great to speak with the leaders and Soldiers, and it felt good to be out doing PT with the outstanding NCOs of the 82d Engineer Battalion. I am extremely proud of all of you. A special congratulation goes out to Staff Sergeant Randolph Delaprema for being selected as Fort Sill's Drill Sergeant of the Year for 2005.

The good news transformation story is that this quarter we will witness the standing up of two engineer battalions: the 20th Engineer Battalion, consisting of three mobility augmentation companies (MACs), one sapper company, and two firefighting detachments (the 507th and 557th) at Fort Hood; and the 19th Engineer Battalion (Combat Heavy), consisting of two vertical companies, one horizontal company, and a survey and design team at Fort Knox. We'll also see two mine dog detachments, consisting of four mine dog teams, standing up at Fort Leonard Wood.

I look forward to seeing many of you at the upcoming Army Engineer Association (AEA) Conference in Orlando, Florida. To register, visit the AEA Web site at <*http://www.armyengineer.com*>. It will be great to meet with everyone and discuss the many topics that are on the agenda.

In closing, I would like to say that I am extremely proud of our Regiment's Soldiers for their contributions and positive impact over the past year. We owe this generation a great deal of gratitude and respect. I am especially proud of those sappers deployed around the world in harm's way—whether it's in Operation Iraqi Freedom or Operation Enduring Freedom or in support of the aftermath of Hurricane Katrina. These Soldiers and their families make tremendous sacrifices each and every day. To those 146 sappers 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!

FIGHTING AS ENGINEERS

By Captain Matthew Louvet

A contemporary operating environment forces today's leaders to truly be flexible and adaptive and to take initiative in completing all assigned missions. My own experience as a combat engineer company commander in Iraq reinforced the need to be able to adapt—accounting for the enemy, the terrain, and the mission—to the full spectrum of combat requirements. Engineer Soldiers and their leaders, uniquely skilled and equipped, must be prepared to execute combat operations to include "traditional" engineer tasks in an urban environment and, when required, to "put down the shovel and pick up the rifle" and "fight as engineers."

Much of my own experience in Iraq was in fighting as an engineer. Field Manual (FM) 7-8, *Infantry Rifle Platoon and Squad*, served as a solid foundational document during predeployment training and on-the-ground mission preparations. This manual provides the necessary information, laid out in a very comprehensible format that can be adapted to fit almost any situation. Two additional references that are useful are FM 3-06.11, *Combined Arms Operations in Urban Terrain,* and Army Training and Evaluation Program (ARTEP) 71-1-MTP, *Mission Training Plan for the Tank and Mechanized Infantry Company and Company Team*.

Engineer companies must be capable of conducting urban combat operations such as raids and cordon-and-search missions. Both are complex and require dedicated planning and focused mission rehearsals before execution. Enabling tasks for these operations include hasty- and deliberate-planning processes, knowledge and understanding of the rules of engagement (ROE), direct-fire planning tools, distribution of graphics, and communications procedures that feed a common operational picture to enable true situational awareness.

As engineers prepare to conduct these missions, the tasks listed in the table below become required training. Engineer leaders must be ready to conduct these missions either as part of a combined arms team or as a ground-mission commander. They must understand the capabilities and limitations of

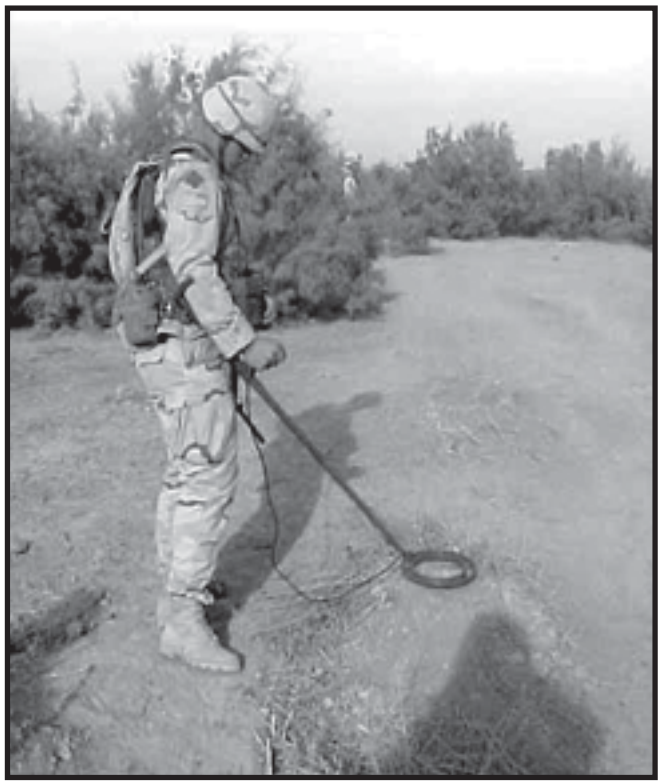
Enabling Tasks for Raids and Cordon-and-Search Operations

Unit Level	Task Number	Task
Company	71-2-0308	Conduct a Raid
Company	71-2-2027	Conduct a Cordon-and-Search Operation
Collective Task	71-2-0320	Infiltrate/Exfiltrate
Collective Task	71-2-0221	Execute Actions on Contact
Collective Task	71-2-0222	Conduct Fire and Movement
Collective Task	71-2-0219	Attack by Fire
Collective Task	71-2-3061	Support by Fire
Collective Task	71-2-0322	Withdraw From Enemy Contact
Collective Task	71-2-2025	Clear a Built-Up Area
Collective Task	71-2-2324	Conduct Roadblock/ Checkpoint Operations
Platoon Task	7-3/4-4113	Knock Out a Bunker
Platoon Task	7-3/4-4114	Clear a Trench Line
Platoon Task	7-3/4-4110	Clear a Building
Leader Task	061-283-6003	Adjust Indirect Fire

Combat engineers work on one of many construction projects.

task-organized units and how to best employ all team members to achieve mission success.

Raids, cordon-and-search operations, and tactical patrols (mounted and dismounted) are typical "fighting engineer" missions requiring detailed planning and using available forces correctly. The engineer commander must task-organize his force based on the target, the objective area, and the capabilities of his units. Required equipment includes building marking materials, detainee binding materials, detainee processing forms, and detailed target folders with pictures. Engineers need training on ROE, stack drills, room and building clearance procedures, and proper search and detainee handling procedures. Leaders must be flexible enough to transition from one mission to another based on enemy contact or the availability of actionable intelligence. For example, there were several occasions when platoons on patrol had to shift their focus and conduct raids. The majority of the raids conducted were hasty with nonorganic units embedded into the patrol. These were "pickup teams" in every sense—enabled by capable leaders and well-known battle drills.



An engineer Soldier uses a handheld mine detector.

Tactical operations that integrate Iraqi security forces are becoming increasingly important for coalition forces. The toughest cordon-and-search operation that my company participated in included elements from a Macedonian special forces unit, the Iraqi civil defense corps, and the battalion headquarters. All inherent differences between these three units had to be worked out during the planning and execution of missions. Fire control, communications, common language and terms, and the integration of diverse units with varying skills and training readiness all had to be addressed to lower the risk. Detailed planning and rehearsals ensured safe and successful mission execution.

Engineer units are tasked to run combat patrols and establish traffic control points (TCP) during patrols. Leaders must brief all aspects of the mission and incorporate rehearsals into the mission timeline. Establishing a TCP is a planned event and requires wire, pickets, interpreters, detainee binding materials, detainee processing forms, phrase cards, and the local area be-on-the-lookout (BOLO) list with pictures. Related training includes establishing and manning checkpoints, conducting individual searches, conducting vehicle searches, and understanding ROE.

Although guard duty is not the most difficult job, it is a common task that must still be accomplished for the security of the unit. Living on a forward operating base (FOB) requires that the unit occupy at least a portion of the guard positions. Tasks that the engineer Soldier must know how to perform include completing range cards, completing a proper sector sketch, and conducting adjacent unit linkup to ensure overlapping fields of fire. Other tools needed include thermal sights, a compass (for reporting visual contact outside the perimeter and correctly filling out the range cards), and some type of communications device.

Manning an entry control point (ECP) on an FOB requires all the tasks and tools that are needed for guard duty plus some others. Part of manning an ECP is guarding it from unauthorized entry. The ROE must be understood at all levels—especially at an ECP with a high volume of traffic (both military and civilian). Language and proper use of an interpreter are

other specific types of training that would benefit Soldiers and leaders at an ECP. Wire is a necessary item if establishing an ECP but—as upgrades continue—HESCO® Bastions and concrete barriers provide additional force protection. Search areas at an ECP require mirrors for searching under vehicles and metal-detecting wands for personal searches. If the ECP is to continue operations during limited visibility, floodlights and flashlights for mirrors also need to be considered.

Combat engineers must be prepared to conduct general engineering tasks. Engineer leaders will routinely be required to conduct force-protection assessments and limited construction projects and have a working knowledge of project management. While most of my assigned construction missions were limited in scale, subordinate leaders needed the necessary skills and tools to be able to draw up a plan for the project, determine the bill of materials, supervise the construction, and conduct quality assurance and quality checks of the project.

Engineers must similarly have a working knowledge of basic environmental infrastructure—sewage, water, electricity, academics, and trash (SWEAT)—and some simple assessment checklists to determine project requirements. Engineers should have a working knowledge of how these systems work or at least the ability to acquire informational references. Leaders should look for what is currently in place, working, broken or missing, and needed to get the system running again to benefit the local area.

Breach and mine-detector teams are two specialty teams that the engineers can provide to both the raid and the cordon-and-search missions. These teams can vary in size, depending on forces available and the mission requirements, but they each require a dedicated security element. The breach teams need to be trained in all manual, mechanical, and dynamic-entry techniques and methods to evaluate structures to determine the suitability of each. In addition to explosives, breach teams need a manual breach kit, including a man-packable, collapsible ladder. The mine-detector teams need to understand their equipment, to include correction operations procedures and system limitations. My company was often a force provider for combined arms missions, sending mine-detector teams with other units to find caches.

Terrain analysis continues to be a necessary and relevant skill for engineers. On numerous occasions, TerraBase, FalconView™, and MrSID® provided us with information on an area for combat operations so that we never went in unprepared. Additionally, these programs allowed us to evaluate our guard locations, ECPs, and guard towers and assess key terrain along lines of communication based on line-of-sight analysis and weapons range fans.

Engineers must always be ready to conduct technical and tactical reconnaissance. Whether assessing route trafficability or conducting bridge-span and load calculations, engineers in my company were regularly reminded of the technical requirements of their craft. Additionally, the requirement for tactical reconnaissance to identify threats to friendly mobility—whether enemy or improvised explosive devices (IEDs)—was an implied task for every movement and an increasingly important component of the unit's troop-to-task analysis.

As the Regiment continues its transformation, the key to success will be its leaders. The Regiment needs competent, confident, and flexible Soldiers and leaders empowered to take the initiative in any scenario. Engineer leaders must be properly skilled in unique, technical capabilities; trained and ready for full-spectrum operations; and equipped for success in traditional engineer tasks. When required—engineer leaders must fight as engineers. The Soldiers and leaders in my own unit, as well as those who fill the ranks of the Engineer Regiment, demonstrate daily that they are up to the task. *Essayons!*

The mighty D9 dozer clears rubble in preparation for a reconstruction mission.

Captain Louvet is the officer in charge of the Scorpion Team at the National Training Center, Fort Irwin, California, serving as a staff engineer trainer. Other assignments include Commander, Charlie Company, 5th Engineer Battalion, during Operation Iraqi Freedom in support of the 4th Infantry Division. He holds a bachelor's in wildlife resource management from West Virginia University and a master's in geology and geophysics from the University of Missouri-Rolla.

Urban Operations Training at the Power Projection Platform "Welcome to Al Wadi"

By Lieutenant Colonel John C. McClellan and Captain Eric M. Noe

Creating challenging, realistic urban-training environments for deploying units requires Army leaders assigned to training support battalions (TSBs) and brigades to adapt and innovate. Early in 2004, 2d Brigade, 91st Division (Training Support) (2-91st TSB), began planning postmobilization training to be conducted at Fort Bliss, Texas, for an Army National Guard brigade combat team (BCT). Accomplishing this goal required some out-of-the-box thinking by the leadership of 1st Battalion, 361st Engineer Regiment (Task Force Redhawk), which is part of 2-91st TSB. This article presents the scenario—and the lessons learned—used to achieve the complex effects of urban terrain and the design and execution of training for a deploying BCT.

Existing Fort Bliss Facilities

Although the Fort Bliss power projection platform (PPP) offered outstanding realism in time-distance factors, desert terrain, and weather, initial reconnaissance of base facilities revealed few that were suitable for patrols, close-quarters combat, or urban-warfare training. The base had range camps that could be converted into forward operating bases (FOBs), but lacked suitable training villages or military operations on urbanized terrain (MOUT) sites. So the observer-controller/trainers (OC/Ts) of the 2-91st TSB began transforming the base into a series of interlinked urban-training sites. These included mock villages, industrial centers, and FOBs capable of supporting squad- or platoon-level patrolling, company and battalion task force cordon-and-search operations, and close-quarters combat operations.

While at Fort Bliss, the 2-91st TSB initially occupied three mobilization base camps that were converted into replicas of the FOBs that deploying forces would occupy in theater. BCT maneuver task forces rotated through FOB Baker, located at Biggs Army Airfield. Two of the five BCT maneuver task forces were housed for 10 days at a time. The 2-91st TSB training concept required Task Force Redhawk to train basic patrolling techniques for the BCT's five maneuver task forces. The training included squad/platoon dismounted security patrols and quick-reaction-force operations and culminated in company raids and battalion task force-sized cordon-and-search operations. A sister training battalion also trained them on mounted patrols and traffic control point operations.

The location of FOB Baker provided a unique opportunity to develop a training plan that would take full advantage of the only urban terrain available in the immediate vicinity—the base itself. In response, Task Force Redhawk created the fictitious province of "Al Wadi"—a combination of villages and urban areas designed to replicate an area of operations located on the outskirts of a large Iraqi city. The Fort Bliss garrison leadership supported the battalion and, for the first time in recent history, training lanes were created directly on Biggs Army Airfield, the adjacent railhead facility, and portions of the main cantonment area of Fort Bliss. Figure 1, page 8, shows the main post areas used for the urban-patrolling operations.

In order to use these main facilities to conduct training, rehearsals, and force-on-force blank-fire combat patrols, a detailed plan was briefed to the PPP and garrison leadership for approval. Several key controls were put into place to ensure the safety of the Blue Force (BLUEFOR) Soldiers, OC/Ts, permanent party Soldiers, and residents and employees of Fort Bliss. A copy of Figure 1 (along with an explanation of the training concept) was given to the garrison commander to provide situational awareness to all on-post agencies on the times and locations of our training patrols. Advance coordination with the provost marshal, airfield commander, Force Protection Office, Public Affairs Office, and various tenant agencies adjacent to the patrolling areas was critical to the plan's success.

The risk assessment for the operating plan included—

- Alerting Fort Bliss garrison agencies of the areas and times of patrol operations.
- Alerting the garrison Security/Force Protection Office and the Provost Marshal Office of the locations of all patrol routes, emplaced training improvised explosive devices (IEDs), mock ambushes, and drive-by shootings.
- Coordinating closely with the Provost Marshal Office throughout operations.

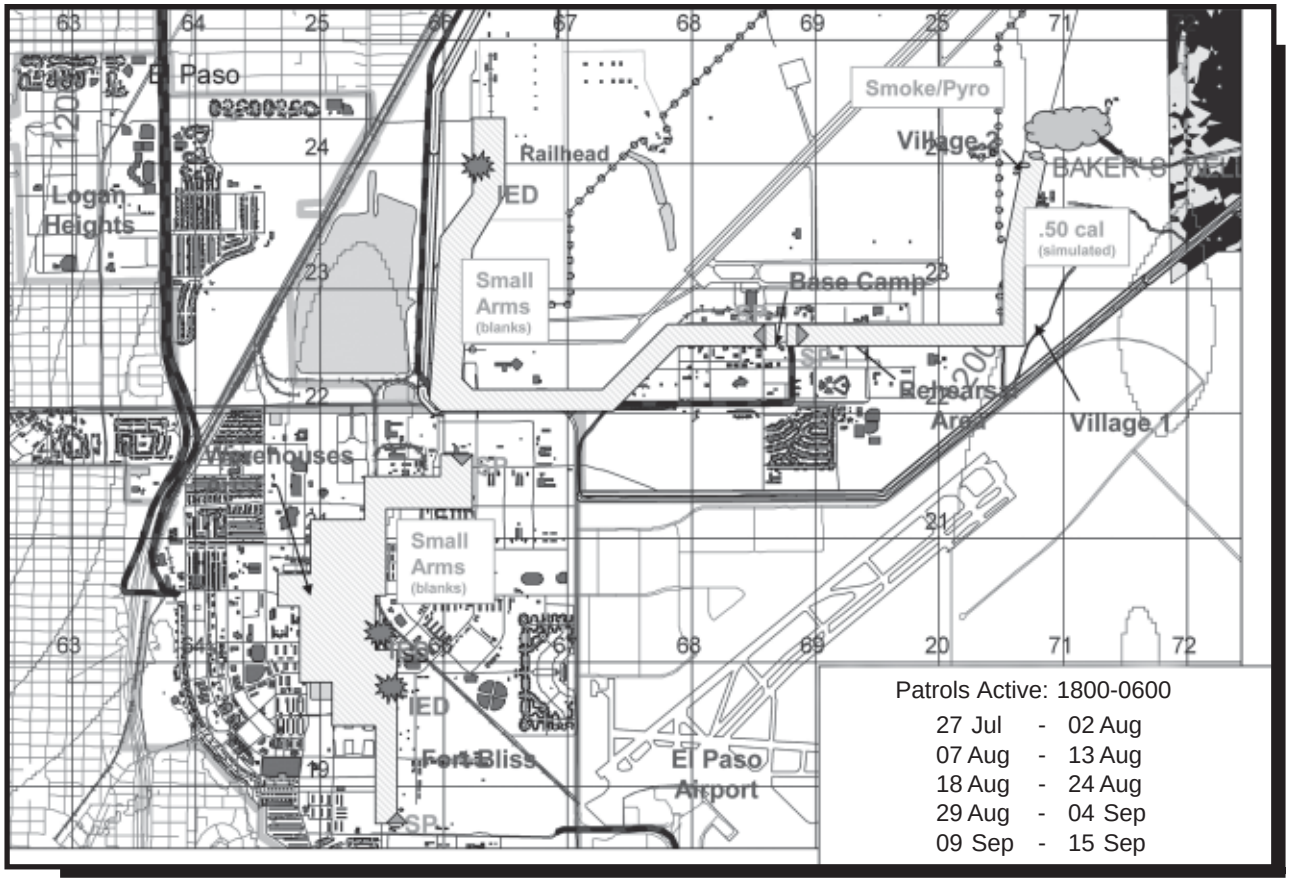


Figure 1. Map of the main post areas used for dismounted patrols

- Positioning OC/Ts in the front and rear of dismounted formations for traffic control.
- Specifying locations where blank-fire weapons, the Multiple Integrated Laser Engagement System (MILES), pyrotechnics, and simulated IEDs would be used.
- Planning routine policing of brass from blanks to prevent hazards to vehicles or pedestrians.
- Training and rehearsing for Opposing Forces (OPFOR) and contracted civilians on the battlefield.
- Adapting exercise rules of engagement to account for military and civilian personnel in the area who were not part of the training (but were a useful backdrop).

In addition, since most of the dismounted patrolling was conducted between 1800 and 0600 hours, limited visibility had to be considered and mitigated.

Creating Al Wadi

Within the Al Wadi area of operations, two major considerations drove the details of the intelligence scenario created to frame the insurgent activity that would operate there. The first was the close proximity of Biggs Army Airfield and the El Paso International Airport, and the second revolved around the Fort Bliss warehouse district and railhead.

Biggs and El Paso Airports

The training scenario presented a growing insurgent threat to coalition air operations at the two airfields that included anti-Iraqi force surveillance and fence line breaches, IEDs on coalition supply routes within the sector, and rocket/mortar attacks aimed at the FOB and the airfields. These activities disrupted coalition air operations and delayed the reopening of civilian air traffic (an interim government priority) at the "Al Wadi International Airport," still under coalition military control since the initial seizure. Thus, task force elements would need to patrol these areas, check fence lines, develop pattern analysis, conduct crater analysis, and locate insurgent firing positions in order to defeat the IED threat and rocket/mortar attacks and restore stability. BLUEFOR dismounted patrolling operations from the FOB included mounted quick-reaction force missions to reinforce dismounted security patrols, react to local demonstrations, or conduct downed aircraft rescue missions in the open desert military training areas east of the airfields.

To support the airfield threat scenario, Task Force Redhawk identified the need for outlying urban settings from which the insurgents could recruit and operate. The task force constructed two small Iraqi villages with basic structures that included centrally located homes and businesses, a school, a police station, and a cafe. The villages were built by the OC/Ts out of pressure-treated lumber and plywood purchased by the brigade through the Fort Bliss Directorate of Public Works and Logistics. While many of the buildings were simple

Figure 2. Village of Al Mattr, main street

one- or two-room structures with a single entry, each village had some complex floor plans and a two-story mosque. Later, several old storage buildings were added that the garrison commander made available. A contract provided soil stabilization of the roads, which started out as off-road tire tracks in the Fort Bliss sand. The northern village of "Akbar-Kristalad" consisted of 41 tightly grouped structures, and the southern village of "Al Mattr" consisted of 63 structures dispersed over a wider area (see Figure 2). The sizes and geography of the two villages allowed different tactical challenges for the commander to consider, including security patrols, raids, or cordon-and-search operations. The construction of the two villages took approximately 6 weeks and cost about $300,000.

Sand-colored paint, courtyards (formed with concrete barriers), junked cars, operational streetlights, and realistic Arabic signage on structures used by role players enhanced the basic plywood construction of the village. Key structures—a mosque, police station, town square, coffee house, and schoolhouse—were treated like the sets of a stage play. A few carefully placed items—Arabic inscriptions and prayer rugs in the mosque, a desk and a bulletin board with police patrol routes in the police chief's office, and a few desks and a map of the Middle East in the school—made these structures complete. Our contracted civilians on the battlefield spent considerable time there and were encouraged to add anything that would make the villages more real. Some of the civilians brought additional furniture, desert plants, and framed artwork, and one industrious El Paso woman made two authentic Iraqi flags! They also cooked food over open fires and played indigenous music. The addition of these features not only maintained the morale of the civilian workforce but made the task of searching rooms and buildings more difficult. Weapons caches were dug into the sand, then they were covered with a carpet and a desk. Maps, photographs, and computer disks were stashed behind pictures.

Task Force Redhawk also inherited the use of a previously constructed "terrorist training camp" that was ideally situated near the two villages (see Figure 3). This complex was surrounded by a 4x2 double-apron barbed wire fence and included a tower, bunkers, an abandoned bus, and a mock building. The complex—dubbed "Camp Al Qaeda" by the OC/Ts—replicated an insurgent staging area and was an ideal target for platoon or company raids, frequently containing a weapons cache or other intelligence indicators for the patrols to discover, search, confiscate, or destroy.

Fort Bliss Warehouse District and Railhead

The Fort Bliss warehouse district and railhead, the second major factor in the scenario for Al Wadi, replicated the northern edge of the city. Several square blocks of large storage warehouses became the local storage and distribution center for humanitarian relief supplies by various nongovernmental organizations. Operating among the legitimate organizations, the task force inserted the "Islamic Children's Relief" agency, an insurgent front whose primary purpose was smuggling weapons and explosives to support attacks on coalition main supply routes and the airfields. The training task forces therefore patrolled the warehouses, checked local (armed) Iraqi security forces posted there, and attempted to uncover evidence of insurgent infiltration and covert weapons smuggling.

From the FOB, patrols moved either east (parallel to the Biggs Army Airfield and the north) in and around two new MOUT villages, or west and then north to the Fort Bliss railhead area. The southern patrolling area encompassed portions of the Fort Bliss main post, including a warehouse district that was ideal for the operational scenario. Through coordination with the garrison, Task Force Redhawk gained access to the warehouse grounds and the interior of selected buildings to portray insurgent operations in this area, eventually leading up to raids or cordon-and-search operations at the company or task force level.

The tactical challenges of the "Al Wadi warehouse district" were the centerpiece of the training. Complex urban features included multistory buildings, deep box-culvert drainage ditches, 90-degree blind corners, loading docks, fenced compounds, streetlights, and dumpsters. Since Fort Bliss is an active military base, real-world traffic added realism to the

Figure 3. Mock terrorist training camp at Biggs Army Airfield

environment. OC/Ts ensured that traffic was unimpeded by the training operation, although the confusion and gawking from post personnel and families as they drove past the training site effectively simulated some of the same conditions found in Iraq.

Patrol routes (5 to 7 miles in length) were controlled by mandating designated checkpoints. These checkpoints, typically power or water substations, required security checks because they provided essential services to the local villages and were routinely sabotaged by insurgents to discredit coalition efforts. Units on patrol would encounter sniper fire, drive-by shootings, informants, rock-throwing crowds, and eventually firefights with armed insurgents found caching weapons inside one of the warehouses.

For the OC/Ts, the checkpoints served to keep multiple, simultaneous patrols "on time, on target" with the established master event list in order to accomplish the training objectives each night. Several squads and platoons could be on patrol at the same or nearby routes, offset only by a later start time. OC/Ts used internal communications to maintain situational awareness and patrol intervals. Squads and platoons were chosen from separate companies to minimize radio collaboration while on a patrol designed to train squad leader and platoon leader instincts.

Using this combination of varying urban terrain and the supporting threat scenario gave the task force the opportunity to interact with friendly villagers and enemy insurgents, apply rules of engagement, hone their patrolling skills, and practice the battle drills they would need to survive these situations in theater. Junior leaders quickly developed decentralized thinking since communications were challenging in their operating environment. At the same time, company command posts and task force tactical operations centers were able to refine tactics, techniques, and procedures; develop link diagrams, pattern analysis, and graduated response matrices; and track the location and status of their small units while outside the FOB wire.

Lessons Learned

Urban terrain available for training with battlefield effects is limited at most Army bases. The 2-91st TSB constructed its own and convinced post leadership to allow it to fire blanks and use pyrotechnics in what was essentially the cantonment area of Fort Bliss. The combination of the railhead, warehouses, airfields, and mock villages became a highly effective patrolling environment once occupied by interactors tied together with a realistic provincial intelligence backdrop.

Traditional Army MOUT sites can be highly effective training for some small-unit tactics, patrolling, and close-quarters combat with simulations or blanks, but full-up "shoothouses" of the type the 2-91st TSB constructed at Fort Bliss are needed to advance training squads and platoons all the way through live-fire close-combat clearing rooms and buildings. What most Army MOUT facilities lack is suitable size; variety of interior layouts; and actual basements, sewers, streetlights, and other features that are found in a real city.

Existing or abandoned urban settings, such as multiblock warehouse districts or housing areas, are extremely effective for large-scale urban-operations training such as company- and battalion task force-sized cordon-and-search operations. A consideration for the Army in this next round of base realignments and closures might be to hold onto one or more suitable areas for this kind of training.

The Army needs an urban warfare center, on the scale of the existing combat training centers, suitable for audiences up to battalion task force level and manned by a dedicated team of observer-controllers and OPFOR who are experts in close-quarters combat and insurgent tactics. An urban operations and counterinsurgency school of thought for mid- to senior-level staff officers and commanders could also be added. In addition, an urban warfare school could be established on par with the Northern Warfare or Jungle Warfare Schools, along with potentially changing a phase of the Ranger School to accommodate an urban-center rotation.

Summary

As 75 percent of the world's population moves to urban areas within the next 10 to 20 years, urban combat will become more prevalent and will increase our Army's need to properly train for it. The province of Al Wadi developed into a highly effective urban and complex terrain training area for a task force in a BCT. The Al Wadi villages have now been relocated; however, before they were moved, elements of this scenario were used again for a second deploying BCT and several separate companies. And United States Army Training and Doctrine Command (TRADOC) and United States Army Forces Command (FORSCOM) tenant units and a number of government, joint, or international organizations also used the villages to support training on numerous occasions.

Sharpen the Edge!

Lieutenant Colonel McClellan served with the 2-91st TSB for eight months as the brigade executive officer before assuming command of the 1st Battalion, 361st Engineer Regiment, in June 2004. Previous assignments include platoon leader, company commander, and battalion S-3. He has served combat tours in Desert Shield, Desert Storm, and Operation Iraqi Freedom and has had extensive overseas experience in Europe, the Balkans, Korea, and Central America.

Captain Noe served as an observer-controller/trainer detachment commander for Bravo Company, 1st Battalion, 361st Engineer Regiment, for two years following his deployment to Iraq. Previous assignments include company commander, battalion S-1, aide-de-camp, battalion S-2, task force engineer, and platoon leader. He has served in Operation Iraqi Freedom, Joint Guardian II, Allied Force, and Able Sentry and was recently assigned to instruct tactics as the U.S. Exchange Officer to the Canadian Forces School of Military Engineering.

Photo by Lieutenant Colonel David E. Chesser

The Combat Corps Wheeled Battalion in the Divisional Warfight

Combat Engineering in an Urban Environment

By Lieutenant Colonel David E. Chesser and Major Adam S. Roth

Imagine a unit being transformed from Code 4 (C4) (not combat ready) to Code 1 (C1) (fully combat ready) in only 152 days and then successfully executing more than 1,400 combat engineer missions in an urban environment in the span of a one-year deployment. A unit engaged by insurgent forces more than 50 times, yet never wavering in the face of the inherent dangers of combat. A unit whose Soldiers were awarded 42 Bronze Stars, 22 Purple Hearts, and 12 Army Commendation Medals for Valor and nominated for the Meritorious Unit Citation. Sounds like Audie Murphy's unit in World War II, doesn't it? Well, it isn't. This is the story of the 458th Engineer Battalion (Corps) (Wheeled), United States Army Reserve, and how its Citizen-Soldiers provided full-spectrum engineer support to the 1st Cavalry Division in the urban environment of Baghdad, Iraq, during Operation Iraqi Freedom. The purpose of this article is to share information with the Engineer Regiment to help guide other engineer units in their preparations for conducting operations in an urban environment in support of the Global War on Terrorism.

Mission Analysis and METL

The corps wheeled engineer battalion is comprised of a headquarters and headquarters company and three line companies. Each line company is comprised of a headquarters element, three sapper platoons, and an equipment and obstacle section (commonly referred to as the support platoon). The three maintenance teams (nuclear, biological, and chemical [NBC] specialists; communications specialists; and medics assigned to the headquarters company) were attached to the line companies during the deployment, which increased their assigned strength. This personnel structure, along with the battalion's organic equipment, was ideal for stability and reconstruction operations in an urban environment.

According to the modified table of organization and equipment (MTOE), the mission of the combat corps wheeled battalion is *"to increase the combat effectiveness of the corps by accomplishing mobility, countermobility, survivability, and sustainment engineering tasks."* Upon mobilization in November 2003, the 458th Engineer Battalion was told by the Engineer Brigade, 1st Cavalry Division, to provide direct support to the division. We only had to look at our secondary mission *"to reinforce divisional engineer units when required,"* to know that we were operating within doctrine. We were being pushed forward from the corps rear into the division fight on an asymmetric battlefield and immediately recognized the need to conduct a thorough mission analysis and revise our mission-essential task list (METL) for combat engineering in an urban environment. The revised METL proved invaluable in guiding the battalion to combat readiness in a minimum amount of time during postmobilization training.

During the home station phase of mobilization, the military decision-making process (MDMP) was used to refine the battalion's METL. The battalion's previous war trace alignment

was to another major theater of operations and was geared for high-intensity conflict. After being alerted for mobilization, the battalion's senior leadership conducted a detailed mission analysis for stability and reconstruction operations. The analysis was that the battalion would not be required to perform many doctrinal engineer missions (such as emplacing or breaching minefields or supporting river-crossing operations), but would be tasked to execute several nondoctrinal missions (such as heavy rescue and route clearance with prototypal equipment). Our refined mission statement became—

"The 458th Engineer Battalion provides mobility, countermobility, survivability, and general engineering to the 1st Cavalry Division in Multinational Division (MND)-Central Baghdad in support of stability operations and support operations in order to set the conditions for coalition forces and enable them to support the progressive transfer of authority to the Iraqi people, their institutions, and a legitimate Iraqi national government."

The battalion METL was then revised, based on the new mission statement and the doctrine of Field Manual 7-1, *Battle Focused Training*.

Training

Based on a training readiness assessment of the stability and reconstruction operations METL, the battalion commander and operations staff officer (S-3) developed a training strategy that ensured combat readiness at the conclusion of the reception, staging, onward movement, and integration (RSOI) process. Because 52 percent of assigned personnel strength was cross-leveled into the battalion within 30 days of mobilization, the strategy initially focused on individual Soldier survivability skills.

While squad leaders and platoon sergeants were executing this training and building cohesive teams, the senior leadership was developing training plans to achieve combat readiness for stability and reconstruction operations. The unit then mapped out a plan to train the additional requirements during a 25-day period of mobilization-station training to attain (METL) proficiency for deployment. This training included multiechelon training in military operations on urbanized terrain (MOUT), basic and advanced demolitions, urban search and rescue (heavy rescue), and counter-improvised explosive device (IED) operations. Our partner throughout the training process was the 3d Battalion, 315th Regiment (Training Support) (3/315th) which assumed the role of unit assistor during the mobilization process. The 458th had previously attended annual training with the 3/315th, who helped plan and execute a training strategy.

Full-Spectrum Operations

The 458th conducted a relief-in-place/transfer of authority, initially supporting the 1st Armored Division on 27 March 2004 and then the 1st Cavalry Division

Photo by Lieutenant Colonel David E. Chesser

Combat engineers emplace prefabricated concrete barriers in support of force protection engineering operations.

30 days later. Our expectation was that stability and reconstruction operations would evolve into nation building, and we would be heavily engaged in general engineering in support of civil-military operations. We were wrong. By the middle of April, Mahdi's army declared war on coalition forces and the insurgency was in full swing. Stability and reconstruction operations turned into full-spectrum operations for the division. The 458th was directed to reorganize a platoon to fight as infantry. And the battalion's mission evolved into route clearance (becoming our bread-and-butter mission), force protection engineering, and heavy rescue and consequence management (taking on a greater sense of urgency due to the use of vehicle-borne improvides explosive devices [VBIEDs]).

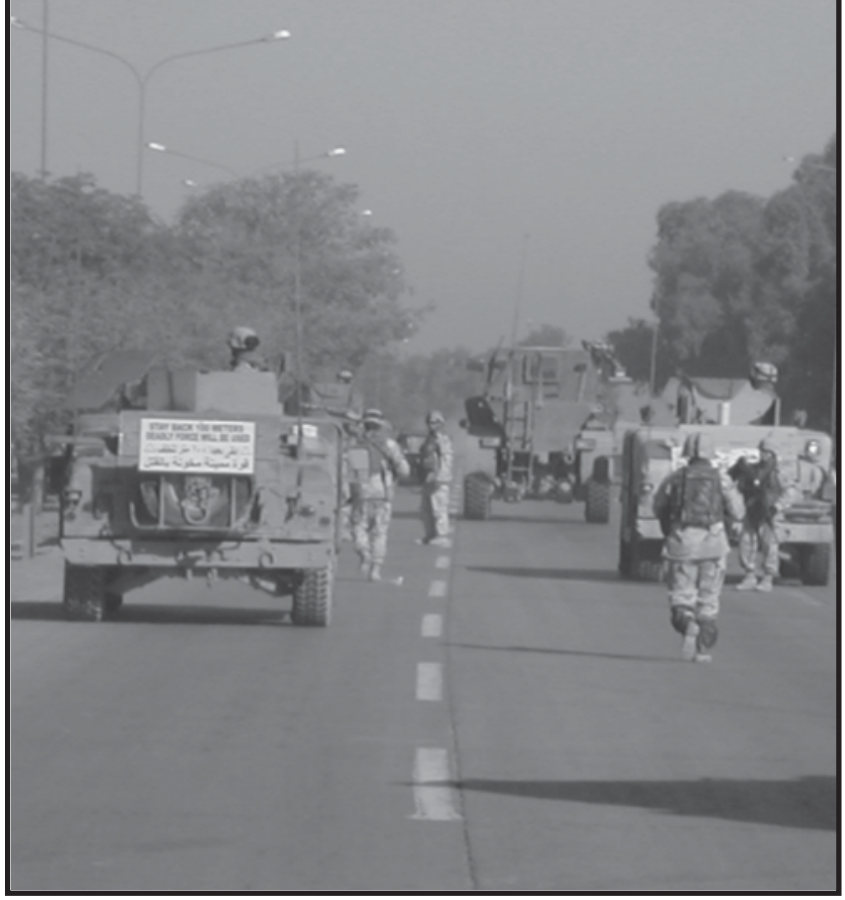


Photo by Lieutenant Colonel David E. Chesser

Soldiers from Task Force Iron Claw perform route clearance operations.

Fight as Infantry

In May 2004, the 458th was tasked by the division Engineer Brigade to reorganize a platoon to fight as infantry and attach it to the 91st Engineer Battalion to help secure a sector of West Baghdad for 9 months. During that period, the platoon executed patrols, raids, cordon-and-search operations, IED clearance, and quick-reaction force missions as mounted and dismounted infantry. The Soldiers executed 450 combat patrols, engaging insurgents on multiple occasions, without a single serious injury. The ability of this platoon to rapidly reorganize and train and successfully execute infantry missions in a tough urban environment is a testament to the platoon's leadership and the rugged training that the corps wheeled battalion habitually executes in peacetime to be able to fight as infantry in wartime.

Route Clearance Operations

Probably the single most important engineering mission executed by the 458th Engineer Battalion was that of conducting counter-IED operations. Known as *Task Force Iron Claw*, the operation assured mobility within the division battlespace by finding IEDs along main and alternate supply routes and coordinating with supporting explosive ordnance teams for destruction or retrieval of the IEDs. Using prototypal equipment known as the Interim Vehicle-Mounted Mine Detection System (IVMMDS), the line platoons executed Task Force Iron Claw operations. The tactics, techniques, and procedures were continuously altered to enhance the task force's capability and survivability in an environment where 93 percent of all IEDs emplaced within Iraq were found. The primary combat system used by the task force was the mine-protected clearance vehicle (MPCV) commonly referred to as the Buffalo. The ability of the Buffalo to "interrogate" potential IEDs with its articulating arm, while the crew remained protected inside the vehicle, made it invaluable. During 12 months of combat operations, Task Force Iron Claw completed 575 missions, clearing 171 IEDs over 34,000 kilometers of roadway. The task force's ability to locate and neutralize IEDs preserved combat power and assured mobility for coalition forces.

Insurgents were using the rural roads outside of Baghdad's population centers to ferry arms and forces from outlying weapons caches into the city. The routes they used were known as "rat lines." Soldiers of the 458th provided the brigade combat teams with no-notice barrier emplacement support for snap traffic control points on many occasions to interdict these rat lines. The battalion also participated in a more unconventional approach to interdicting the rat lines by using mine-clearing line charges (MICLICs). The end result was the denial of insurgent lateral maneuver.

Force Protection Engineering

Many of the forward operating bases (FOBs) constructed during Operation Iraqi Freedom had limited force protection due to the availability of barrier materials or engineers to complete force protection projects. The heavy equipment available to the battalion, coupled with the abundance of military occupational specialty 21B combat engineer Soldiers, made this mission a perfect fit. The battalion was continually employed in the heightening of force protection at FOBs and Iraqi facilities within the Task Force Baghdad area of responsibility. Anything from erecting precast concrete barriers around key facilities, filling HESCO® Bastions, constructing

berms around FOBs, and erecting concertina fence were all missions that the 458th Engineer Battalion performed on a daily basis. In support of force protection operations, the battalion constructed more than 19 kilometers of earthen berms and 11 kilometers of concertina fencing, emplaced 1,523 mortar bunkers and 34,071 precast concrete barriers, and filled 23,690 HESCO Bastions at 11 FOBs and numerous Iraqi government facilities to harden them against insurgent attack.

Heavy Rescue Operations

Before deploying, the 458th received the mission to provide a consequence management and heavy rescue capability as a result of weapons of mass destruction incidents within Baghdad. A heavy rescue unit was trained and equipped at the Fort McCoy Mobilization Station in Wisconsin and provided urban search and rescue and confined-space rescue on numerous occasions within the Task Force Baghdad area. (A description of this unit and its training can be found in the January-March 2005 issue of *Engineer*, page 37.)

The pinnacle achievement of the heavy rescue unit, known as R*escue One*, was its actions in response to an anti-Iraqi forces bombing in the Ghazaliyah section of Baghdad on 29 December 2004. An Iraqi family was held hostage inside a three-story structure that was wired with 1,800 pounds of explosives. Once the Iraqi police arrived and opened the door to the residence, the blast devastated the entire neighborhood. Members of Rescue One, working hand-in-hand with the Iraqi first responders, saved the life of a 22-year-old Iraqi woman through a 3-hour, confined-space rescue and recovered all four of her children using confined-space rescue and heavy-equipment recovery techniques.

Support of Fallujah Offensive

In November 2004, the 458th Engineer Battalion received the mission to provide horizontal engineering support to the 2d Brigade Combat Team and the United States Marine Corps during the Fallujah Offensive. The battalion staff performed the MDMP (as it had for every mission the battalion received) and tailored a platoon-sized task force of horizontal construction assets with embedded 21B Soldiers for security. During a 2-week period, the task force constructed earthen berms around FOBs, emplaced HESCO Bastions around command and control nodes, dug in the brigade artillery battery, and constructed multiple traffic-control points.

Civic Action Projects/Humanitarian Assistance

Due to the intensity of the insurgency, the brigade combat teams frequently conducted kinetic (offensive) operations to establish control in sectors. The goal of the division commander was to eventually conduct nation-building operations. His intent was to take the AK-47s out of the hands of the insurgents and replace them with shovels, employing the insurgents in projects that would help to rebuild their nation. The negative aspect of kinetic operations was the collateral damage that resulted, creating a need to quickly show the coalition's commitment to "making it right." The 458th Engineer Battalion's Headquarters Company was tasked to support what became known as *Operation Rhode*, and served to get the Iraqis back on their feet after kinetic operations. The headquarters company transportation section purchased, stored, and delivered "Rhode Packages" to brigade combat teams after combat operations in their sectors.

- **Sustenance packages** consisted of items for meeting basic nutritional needs (including rice, flour, and canned goods).
- **Construction packages** consisted of basic construction materials required to make repairs to damaged homes (such as lumber, nails, roofing materials, and plywood).
- **Neighborhood area council packages** consisted of items to help reestablish government at the local level (such as computers, office automation equipment, and basic office furniture).

This form of nation building provided coalition forces with a method of demonstrating commitment to the rebuilding of Iraq.

Summary

The 458th Engineer Battalion served with distinction during Operation Iraqi Freedom in the tough urban environment of Baghdad. The broad spectrum of missions the battalion accomplished reflects its adaptation of engineering doctrine to the contemporary operating environment, coupled with effective training and sound leadership. The flexibility of the corps wheeled structure, when combined with the versatility of the Army Reserve's Citizen-Soldiers, makes it an ideal organization for supporting divisional operations across the continuum of conflict.

Lieutenant Colonel Chesser is the commander of the 458th Engineer Battalion. He commanded a combat corps wheeled engineer company in Germany and has served in numerous staff and leadership positions. He is a graduate of the Command and General Staff College and the Sustaining Base Leadership Management Course.

Major Roth is the executive officer of the 458th Engineer Battalion and has commanded a combat heavy engineer company. He is a graduate of the Command and General Staff College and holds a master's in mechanical engineering from Boston University.

Effecting a Major Road Repair in Baghdad

By Lieutenant Colonel Keith A. Landry, Major Glen T. Adams, and Captain Steven M. Brown

Just days after completing a relief-in-place/transfer of authority with its predecessor, Task Force Black Diamonds deployed engineer assets off a secure base camp for the first time in support of Multinational Division–Baghdad. The task force was formed around the 92d Engineer Battalion (Combat) (Heavy) as part of the 36th Engineer Group (Combat). The task force consists of a headquarters and support company, two combat heavy engineer line companies, a United States Army Reserve combat heavy engineer line company, a chemical company, and an Army National Guard utilities detachment. The mission was to repair three road craters on a corps main supply route. Using some form of improvised explosives placed deep inside existing culverts, anti-Iraqi forces had created the craters along a three-lane road, which closed the westbound lanes to civilian traffic.

Engineer Reconnaissance

An engineer reconnaissance revealed that the craters averaged more than 40 feet in diameter and 8 feet in depth. Key leaders gathered to disseminate the results of the reconnaissance and receive the battalion commander's initial guidance before developing courses of action. The intelligence staff officer's (S-2's) engineer preparation of the battlefield revealed a pattern of anti-Iraqi force activity in the area where engineers would be traveling and working. Terrain analysis at all three crater locations showed that an eastbound three-lane road, set apart by a 10-meter-wide dirt median, paralleled the three westbound lanes. Because the westbound lanes were closed, there was significant civilian traffic on the eastbound lanes in both directions except during nightly curfews. At times, civilian vehicles also traveled on a one-lane dirt road that paralleled the damaged road to the north. An extended area of one- to three-story buildings flanked the eastbound lanes. The area to the west of the craters was an open field, dominated by a high earthen berm near the road. The security plan would have to address these concerns while on-site as well as while moving to and from the crater locations.

Course of Action

Photographs and measurements of each crater were used to develop a course of action. Labeling the craters from west to east, Crater A was 1.5 kilometers west of Craters B and C, which were just 50 meters apart. Concept sketches were developed to repair all three craters simultaneously or in groups. The battalion commander's guidance was to repair Crater A first, then repair Craters B and C simultaneously. This would potentially increase the total time spent on-site, but by using maneuver and aviation assets for security, the risk would be mitigated and the engineer footprint would be relatively small. The engineer assets task-organized for the mission included elements from the Reserve line company's horizontal construction platoon and one of its vertical construction

platoons, along with haul assets from the headquarters and support company's heavy equipment platoon.

Crater A

Final refinement of the plan further delineated each crater repair into three distinct phases:

- **Phase I** consisted of mobilizing and deploying horizontal engineer assets to clear blast debris from the crater and repair the road base (see photo on page 15). Required equipment included a vibratory roller, a front-end loader, a hydraulic excavator (HYEX), a bulldozer, a Bobcat®, two M916 tractors with M870 trailers carrying Texas "T" concrete barriers (which served as vehicle-borne improvised explosive device [VBIED] blast shields), and five 20-ton dump trucks. Two of the trucks were loaded with fill, while the remaining trucks carried crushed limestone. To minimize the fill required to repair the subbase, blast debris from the craters was used for backfill. Clean fill was deposited on top of the blast debris in layers and compacted. An 8-inch lift of crushed limestone was used as the base for the 10-inch-thick reinforced concrete wearing surface.
- **Phase II** began once the roller started to compact the layer of limestone. Engineers from the vertical construction section prepared the required formwork and placed the reinforcing steel. The section consisted of a squad, a trailer-mounted 250- cubic-feet-per-minute (CFM) air compressor, a 5-ton dump truck, and several masonry kits. The dump truck's bed was raised and used to drop the prefabricated forms and rebar mats onto the road surface. The forms were used where the crater had breached the road shoulder. The bars of the rebar mats were tack-welded to reduce fabrication time, allow rougher handling in transit, and increase the speed of emplacement.
- **Phase III** consisted of the actual concrete placement. A local contractor provided the concrete for the pour. The vertical section Soldiers were the only ones on the ground to work the concrete into the form, and the engineer Soldiers provided local security. For Crater A, Phases I and II took place on Day 1 of the mission. Phase III, which required five truckloads of concrete (approximately 40 cubic yards), took place on Day 2. Since five concrete trucks were never available at one time, engineer Soldiers had to wait while the trucks returned to the batch plant to be reloaded. Turnaround times for this mission ranged from 45 minutes to 3 hours depending on traffic, route conditions, and camp gate access. Using a concrete additive decreased its curing time, allowing the crater repairs to be completed and the road available for traffic much sooner.

Craters B and C

Plans for repairing Craters B and C were refined using lessons learned while repairing Crater A. During initial movement to the location of Craters B and C, the engineer lieutenant in charge staged a heavy, expanded-mobility tactical truck (HEMTT) wrecker, the 20-ton dump trucks, and the vertical section's equipment in preparation for Phases II and III on Craters B and C. Engineer assets would be called forward from the rally point as required to minimize the size of the engineer footprint on-site. During the military decision-making process (MDMP), it was difficult to determine how much usable fill material was in each crater. By using the asphalt and

A local contractor provided the concrete that Task Force Black Diamonds placed to repair Crater B.

A Task Force Black Diamonds Soldier uses a float to finish the repair of a crater after the vibrating and screeding process.

blast debris from Crater A to repair the subbase—and removing the large, unwieldy pieces—the horizontal construction section only had to bring in fill equal to roughly 25 percent of the crater volume. Craters B and C were so close to each other that the engineers determined that the horizontal section could start Phase I on Crater C while the vertical section executed Phase II on Crater B without increasing the number of 20-ton dump trucks required. On Days 3, 4, and 5, engineers hauled and placed one 20-ton load of blast debris taken from Crater A, two loads of fill, and four loads of crushed limestone per day. On Day 4, they placed 40 yards of concrete and repaired Crater B. On Day 5, they placed 64 yards of concrete and repaired Crater C.

Lessons Learned

There are several key lessons learned from this repair mission:

- Troop-leading procedures and the MDMP are vital to the preparation of executable plans and must be fully understood at all levels of command.
- Engineers must proactively develop a security plan that integrates maneuver units with engineers in an urban environment to take advantage of the maneuver units' ability to observe larger areas at greater distances than the engineers.
- Planning rally points near project sites allows equipment to be staged off-site and reduces the number of vehicles exposed to anti-Iraqi force attacks.
- Prefabrication of rebar mats and forms limits the time Soldiers are exposed on-site.
- Control measures during the MDMP must be incorporated into the security plan to mitigate the stress on site security caused by civilians on the battlefield.

Conclusion

During the repair of the three road craters, Task Force Black Diamonds placed 144 cubic yards of concrete over a five-day period. The concrete was given three days to cure before the route was reopened to military and civilian traffic. It has remained open ever since without needing repairs, despite being struck by additional mortar rounds. The task force continues to provide construction engineering and chemical force protection to Iraqi army, Iraqi police, and U.S. Army units within the supported area of responsibility in both complex urban terrain and more rural locations.

Black Diamonds—With Pride!

For additional information, or to get a copy of this article that discusses in more detail the specific tactics, techniques, and procedures used by the task force, contact the battalion via Secret Internet Protocol Router Network (SIPRNET) or contact <*James.L.Moore@us.army.smil.mil*>.

Lieutenant Colonel Landry is the commander of the 92d Engineer Battalion (Combat) (Heavy). He holds a doctorate in civil engineering from Rensselaer Polytechnic Institute, Troy, New York, and is a professional engineer in Virginia.

Major Adams is the battalion operations officer of the 92d Engineer Battalion (Combat) (Heavy). He holds a degree in general studies and psychology from Washington State University, Pullman, Washington.

Captain Brown is the commander of Charlie Company, 365th Engineer Battalion (Combat) (Heavy). He holds a bachelor's in agricultural and biological engineering from Pennsylvania State University, University Park, Pennsylvania, and is currently working on a master's in environmental engineering at his alma mater.

National Training Center (NTC)

SWEAT

By Lieutenant Colonel Thomas H. Magness and Major James Ahearn

The status of infrastructure, and the ability to show improvement, is critical to the success of the mission in Iraq and Afghanistan. NTC is addressing this issue by preparing units to assess infrastructural deficiencies and develop plans to remedy critical shortfalls. By aggressively seeking to determine the current state of infrastructure through assessment and interaction with local leaders—and then using all available assets to design and implement solutions—units will be successful in achieving their intended effects and reaching overall strategic goals.

SWEAT Assessment

Although there are variations among units, NTC defines "SWEAT" as the status of sewage, water, electricity, academics, and trash. The SWEAT assessment simply provides a format for assessing these conditions. During reception, staging, onward movement, and integration (RSOI), rotational units are given the task of performing an assessment of actual facilities on Fort Irwin, such as the sewage treatment facility and the electrical distribution system. As the rotation progresses, units should continue this process by conducting an assessment of each town in the area of operations.

Many Soldiers are daunted by the task of performing an evaluation of something such as a power plant, but there are tools available to help. One such product is the SWEAT Smart Book, a tool produced by the Sidewinder team in collaboration with the United States Military Academy faculty, the United States Army Engineer School, and the United States Army Corps of Engineers® (USACE). The Smart Book is an easy-to-use guide that identifies the basics of facility operations and provides checklists of information required for further analysis. The SWEAT Smart Book and other associated infrastructure assessment tools are available for distribution through the Sidewinder Team at NTC or online at the Sidewinder home page <*http://www.irwin.army.mil/Units/Operations+Group/Sidewinder*>. (Select "Resources" from the menu.)

In addition to assessments conducted by the unit, a great deal of information is available through local leaders and public officials. This information is also helpful because it indicates the most pressing needs as seen by those who are the end users of each system. By addressing critical needs first, coalition forces are able to demonstrate their resolve to improve the living conditions of the average citizen. Doing so eventually robs the insurgency of its legitimacy. Training units are able to conduct assessments, develop plans and specifications, and project scopes of work and initiate contracting measures for proposed infrastructure projects.

Professional Assistance

NTC and USACE have recently teamed up to provide even more realistic training by deploying a Forward Engineer Support Team (FEST) during rotations. This team, comprised of USACE military and civilian personnel, works in support of the brigade. The team's professional background provides the ability to produce comprehensive design work, to include identification of resources required for each project. In addition, the FEST brings with it a Tele-Engineering Kit, which enables the team to simultaneously interact with research and design facilities worldwide, bringing the full weight of USACE to the fight.

A recent addition to the NTC rotation is Soldiers from the engineer prime power battalion. Working in conjunction with the FEST, the battalion is trained and ready to enable the brigade combat team (BCT) to assess and improve electrical infrastructure in the forward operating bases (FOBs) and the supported town populations.

A USACE FEST conducts an assessment in Medina Wasl, a mock Iraqi training village at NTC.

Project Management

BCTs are often challenged to fully leverage the engineer capabilities within their ranks and to make any meaningful progress with regard to infrastructure and project delivery during a 14-day rotation. While the BCT includes a variety of units with the requisite skills and tools (SWEAT Smart Books, FESTs, and prime power members; trained combat and construction engineers; and civil affairs specialists), they are generally best served by a dedicated organization with the leadership and staff support to meet the monumental tasks associated with reconstruction.

As trainers for the special troops battalions (STBs)—or brigade troops battalions (BTBs) in our current doctrine—within the BCT, the Sidewinders continue to take observations from the theater and apply them to the training scenario and with NTC rotational units. Currently, deployed BTBs often have the lead role for reconstruction within their supported BCTs, leveraging the capabilities of its staff and leaders for what is among the top operational priorities for our forces. Deployed units have determined the magnitude of a reconstruction program with hundreds of individual projects valued in the tens or hundreds of millions of dollars. Requirements for work inspections, pay agent duties, and military and civilian liaison responsibilities across the brigade's area of responsibility are worthy of focused (command) oversight. As the doctrinal command and control node for attached units such as FESTs, prime power, civil affairs, and engineers, STBs/BTBs are often in the best position to build and lead the team to address the infrastructure needs, in coordination with the Iraqi government leadership. The Sidewinders have developed a suite of tools to assist those units that are assigned the reconstruction/project management mission, to include staff products and project management tools.

Summary

As units aggressively seek to employ all available skills and tools in the collection and analysis of relevant information—and then develop coherent, achievable goals—they find themselves postured for success in the battle for the hearts and minds of the local population. By showing tangible progress in the daily life of average citizens through steady, meaningful improvements to critical infrastructure, coalition forces will earn their trust and respect, denying the enemy the same. This is just as important to success at NTC as it is in Iraq and Afghanistan.

Lieutenant Colonel Magness is the Senior Maneuver Support Trainer, Sidewinder 07, at the National Training Center, Fort Irwin, California. He previously served as the District Commander for the Detroit District, United States Army Corps of Engineers. He is a graduate of the United States Military Academy and holds a master's in civil engineering from the University of Texas.

Major Ahearn was the Assistant Brigade Engineer Trainer, Sidewinder 03B, from 2000 to 2005. He was recently selected for the civil affairs branch and began his new functional area training at Fort Bragg, North Carolina, in June 2005. He received his commission through Officer Candidate School at Fort Benning, Georgia.

The Army's Top Firefighter

By Ms. Cheryl Green

Sergeant First Class (SFC) Wayne J. Reinhardt was recently chosen as the Military Fire Officer of the Year by the Department of the Army. SFC Reinhardt, recognized for his dedication to mission accomplishment, was nominated by his supervisor. He first won the Northwest Region Military Fire Officer title, then was nominated for and won the Army Military Fire Officer title, and finally was nominated for the Department of Defense Military Fire Officer of the Year award.

SFC Reinhardt was officially presented the Northwest Region Military Fire Officer of the Year award at the Department of Defense Fire and Emergency Services Training Conference held from 11-16 August 2005.

Photo by Cheryl Green

Sergeant First Class Wayne J. Reinhardt, Army Military Fire Officer of the Year

As a senior training developer and writer for the Army's firefighters at the United States Army Engineer School, Fort Leonard Wood, Missouri, SFC Reinhart ensures that all firefighting equipment and training manuals are first-rate for Army firefighters. He has managed and developed multiple training products to support the Army's training efforts for both individual firefighters and firefighting units, to include producing two manuals six months ahead of schedule without compromising quality. He serves as the voice for Active Army military firefighters, bringing current firefighting issues to the International Association of Fire Chiefs working group sessions. Selected to review new equipment training for future firefighters on the newly developed Tactical Fire Fighting Truck (TFFT) and verify the training materials, SFC Reinhardt provided significant input during this process.

SFC Reinhardt was recognized for many outstanding achievements in several of the positions he has held, including United States Army Engineer School Liaison for all Active Army, United States Army Reserve, and Army National Guard firefighters; shift supervisor at the Louis F. Garland Fire Academy, Goodfellow Air Force Base, Texas; Active Duty Unit Advisor to 15 Ohio Army National Guard and Reserve units activated during Operation Iraqi Freedom; Chief Fire Inspector at Camp Doha, Kuwait; and Senior Firefighter on the Flatiron Air Ambulance teams at Fort Rucker, Alabama.

SFC Reinhardt has served more than 18 years as an Army firefighter and has volunteered at local fire departments. He currently volunteers at the Duke Fire Protection District, where he trains local volunteer fire district members to National Fire Protection Association (NFPA) and Missouri standards. In addition, he volunteered as a firefighter for five years at the Barker Volunteer Fire Department, Barker, New York.

SFC Reinhardt has also volunteered for the *Christmas in April* program in San Angelo, Texas, and has rebuilt and repaired homes for the *Habitat for Humanity* program, where he helped organize two teams to repair two homes in two days.

SFC Reinhardt is a certified Master Army Instructor and Master Air Force Instructor, who has shared valuable knowledge with his students over the years. He is a highly skilled and competent fire officer who continuously pursues knowledge in the firefighting field.

Ms. Green is a contributing editor for Engineer. She also edits training and doctrine publications for the Directorate of Training and Leader Development, United States Army Engineer School, Fort Leonard Wood, Missouri. She holds a bachelor's in computer information systems from Northwestern State University, Natchitoches, Louisiana.

New Tactical Fire Fighting Truck

By Specialist Judith D. DaCosta

Representatives from Pierce® Manufacturing, Incorporated, and the Department of the Army, including the Commanding General of the 89th Regional Readiness Command, presented the 406th Engineer Fire Fighting Detachment with a new M1142 Tactical Fire Fighting Truck (TFFT) on 29 January 2005, at the Army Reserve Center in Salina, Kansas. The TFFT is engineered like no other vehicle in use by the military today. It combines the superior mobility of the Army heavy expanded-mobility tactical truck (HEMTT) with the advanced firefighting capabilities of Pierce fire apparatus. The result is a multifunctional vehicle that is ready to deploy in almost any terrain and combat five types of fires/hazards: wildland; structural (limited to two stories or less); petroleum, oils, and lubricants (POL) and hazardous materials (HAZMAT); tactical vehicle; and aircraft crashes.[1]

The M1142 Tactical Fire Fighting Truck in action

The development of the TFFT adds another dimension to what Pierce offers to the fire service and the U.S. military. Pierce technology demonstrates how this firefighting apparatus can help first responders in domestic communities as well as worldwide. Many Reservists are full-time civilian firefighters who use Pierce equipment in their hometown fire departments and—now—on deployment. This is a unique feature that no other company can say about its equipment.

The new TFFT, which was on display during the presentation, was referred to as a product of dedication and of great benefit to the military. More than 7,000 employees of Pierce Manufacturing and Oshkosh® Truck Corporation have taken great care and pride in providing Reservists with the finest firefighting truck in the world.

In addition to the presentation of the new TFFT, the ceremony highlighted the achievements of the 323d Engineer Fire Fighting Detachment, whose members were recognized in November 2004 for rescuing injured Soldiers from a downed Chinook helicopter in Al Fallujah, Iraq. The 323d unit members were also recognized for the completion of a week-long TFFT training course.

Specialist DaCosta is the unit administrator of the 203d Mobile Public Affairs Detachment. She has completed the journalism course at the Defense Information School in Maryland and is majoring in English at Wichita State University.

Endnote

[1] Major Mollie Pearson and Mr. Mike Bonomolo, "The Future Army Tactical Fire Fighting Truck," *Engineer,* January-March 2005, pp 59-61.

A HORSE OF A DIFFERENT COLOR

THE MANEUVER ENHANCEMENT BRIGADE

By Colonel Christopher J. Toomey

As our Army becomes a more modular force, it will no longer be tied to a divisional structure and can assemble a force based on the situation. Indeed, it is clear that the Army is moving rapidly to transform the existing divisional brigade combat teams (BCTs) into the new structures and creating new ones such as the "4th BCT" in several divisions. The current main effort is on developing units of action (UAs)—heavy, infantry, and Stryker BCTs that are stand-alone organizations purportedly tailored to the way they fight—with a nod toward the flexible two- and three-star-level units of employment (UEx) that will serve as the primary warfighting headquarters.

Across the rest of the Army, elements are also transforming to support this more modular approach by creating support brigades that are essential to the success of the force. What was formerly their division or corps predecessors are rapidly becoming sustainment brigades (division support commands/corps support groups), fire brigades (division/corps artillery brigades) or aviation brigades (division/corps aviation brigades). These support brigades—though more flexible and modernized and equipped with more robust command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR)—are in character the same as their ancestor units.

There is one support UA, however, that is truly groundbreaking. It not only has no formal antecedent—it really is a horse of a different color—but it looks to bring to the forefront the application of freedom of action and force protection as disciplines that not only have a unique jurisdiction demanding a unique expertise but clearly recognize the evolving nature of warfare as we move from an Army based on a linear model to one adept at working in a nonlinear, noncontiguous environment that also includes the simultaneous conduct of decisive, stability, and support operations. The maneuver enhancement brigade (MEB)—currently being developed in concept by the United States Army Maneuver Support Center, Fort Leonard Wood, Missouri, and on the ground at Fort Lewis, Washington with the provisional 555th Maneuver Enhancement Brigade (formerly the 555th Combat Engineer Group)—will provide the UEx, joint force, or muli-national commander with a tailored, flexible, versatile force that is adept at fusing the elements of freedom of action and force protection, thus minimizing seams arising through stove pipe approaches and providing a linkage to the emerging Protection Joint Functional Concept. Additionally, it can fill a role as a force provider for nuclear, biological, and chemical (NBC); air defense; military police; and engineer assets, as well as a rear area command when properly augmented.

Characteristics

The MEB is a *tailored, combined arms force*. Aside from its headquarters element and the organic communications and logistics elements that form the basis for commanding, controlling, and supporting the brigade, the MEB is a mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC)–dependent organization. It leverages emerging modular principles and the "plug-and-play" nature of developing forces to apply the right force for the mission. Typically, but not exclusively, the MEB is composed of engineer, military police, chemical, air defense, civil affairs, and other units that routinely function together during protection, stability, and support operations. As necessary, the situation may dictate the assignment of maneuver or other types of units to the MEB. These forces may or may not be part of the MEB at home station, but will be assigned as necessary. For example, at Fort Lewis, the 555th includes a chemical decontamination battalion, a corps wheeled combat engineer battalion, and a combat heavy engineer battalion, as well as potentially some other units, to include an air defense artillery battalion. This presents some challenges since the cohesiveness found in the more fixed BCT organizations is not currently inherent in the MEB; the MEB will need to develop the procedures to rapidly and effectively integrate units from across all Army components.

The MEB is a *networked force*. Expected to operate over long distances and throughout an expanded battlespace, the MEB will have robust C4ISR in order to ensure seamless horizontal

and vertical integration and full situational understanding.

The MEB is *joint* in nature. The MEB fills a void that is not unique to Army forces and represents an exclusive joint capability that is not found among the other services that are oriented along more functional lines. Clearly, the MEB can operate within a joint task force and is ideal in the event of stability and support operations.

Forming the Provisional MEB

The 555th and Fort Lewis were a logical choice for the initial MEB. Clearly, Fort Lewis is an installation that is developing a culture of transformation. With two Stryker BCTs already formed and the Stryker-based 2d Cavalry Regiment in transition, the community at Fort Lewis is emerging as a place with well-defined business practices to manage change. This includes exigent facilities such as the Mission Support Training Facility, a great resource for training and supporting staffs and units. Recently redeployed from Operation Iraqi Freedom, the 555th task organization represented a mix of engineer and chemical units that was inherently geared toward maneuver enhancement. Indeed, while operating with the 4th Infantry Division during Operation Iraqi Freedom, the 555th provided maneuver support and force protection for the division and operated along many of the same lines expected of an MEB. Additionally, the great diversity of echelon-above-division units at Fort Lewis provided a pool of units to draw from in developing the MEB.

Granted provisional status in October 2004, the 555th is evolving its missions and mission-essential task list (METL) to reflect expected battlefield tasks and has embarked on a rigorous training program to develop its expertise in command and control to provide freedom of action and force protection. All along, the unit is staying linked with the United States Army Training and Doctrine Command (TRADOC) proponent—the Maneuver Support Center—to provide feedback and lessons learned. Additionally, the 555th is fully cognizant that its subordinate units may be individually committed to current operations. This is validated since one of its battalions is already deployed to Afghanistan. Currently, the 555th consists of a diverse mix of engineer and chemical forces and is expecting the assignment of air defense artillery units as they relocate to Fort Lewis.

To focus its efforts, the 555th is concentrating on providing freedom of action through line-of-communication clearance and security, construction and maintenance, and movement control. In the area of force protection, it is examining securing critical facilities and infrastructure, NBC defense and mitigation, and command and control for internment facilities. Additionally, it is exploring the MEB's role in civil-military operations, as well as limited offensive and defensive operations. Working through a series of exercises virtually supported at Fort Lewis, the 555th is gaining insight into the desired composition of the end-state MEB, while learning how to operate as an MEB with the forces in hand.

The MEB concept was recently explored during Exercise Eagle Talon, a command post exercise held at Fort Campbell, Kentucky. The 555th served as an MEB as part of a UEx operating with various UAs. Charged with command and control of force protection across the UEx and area of operation-wide freedom of action, the MEB demonstrated that it could control a wide variety of forces as it provided the required level of freedom of action and force protection across the area of operation.

Additional Challenges

In managing any change, there are challenges that require attention. The continued development of the MEB as an effective force is no different. The MEB concept has a harmonizing effect across multiple branches. Yet, it goes against a tradition of having pure functional brigades—such as engineer, military police, chemical, and air defense artillery—that typically maintained resident expertise at the corps and division levels. The MEB does not take the place of the functional brigades nor their expertise that is applied at the broader units of employment-operational (UEy) level and can be applied at the UEx level if the situation dictates. All branches that are prime candidates for inclusion in the MEB need to look at how they can best evolve their forces to work as part of the MEB.

Another challenge is developing leadership. The MEB will require leaders who are broad-based and can operate across heretofore branch-specific functional lines. Developing these leaders from typically stove-piped career paths is a challenge that must be addressed as the MEB concept progresses. No single functional branch has supremacy; rather, it is essential that the best leaders be selected for key assignments.

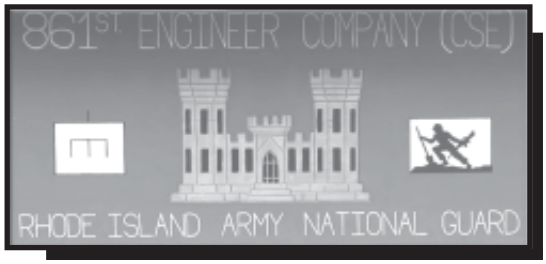
Toward the Future

The development and establishment of MEBs will provide commanders with a versatile combat force that can be tailored to a wide spectrum of operations. Ideally suited to meet requirements in the contemporary operating environment, the MEB is a key supporting UA that will enhance the ability of both maneuver BCTs and the other support brigades and ensure that our Army is successful in current and future operations.

Colonel Toomey commanded the 555th Combat Engineer Group and 555th Maneuver Enhancement Brigade (Provisional) from 2003 to 2005. He currently commands the Afghanistan Engineer District in Kabul.

Attention Units!

Many post offices will not deliver mail without a street address. Please contact us to update your mailing address if the one we are using for you does not include a street address. Include the old address and your telephone number, as well as the corrected address, and e-mail to <*engineer@wood.army.mil*>.



THE 861ST ENGINEER COMPANY PREPARES FOR DEPLOYMENT

By Sergeant John Cervone

Early this year, Soldiers of the Army National Guard's 861st Engineer Company trained at Camp Shelby, in Mississippi, for their company's deployment to Iraq. The unit's mission there would be new and dangerous. These engineers are normally heavy-equipment operators and mechanics and are trained to build bridges and airfields, maintain sewer and water systems, and restore electricity. But in Iraq, many military operations require combat engineers. They find explosive devices and remove and safely detonate them as part of an effort to clear roadways. In addition, they impede enemy movement by using explosives to create obstacles.

The training the Soldiers received included clearing terrain obstacles, opening routes for armored fighting vehicles, and clearing minefields. Due to the explosive hazards facing our troops in Southwest Asia, extensive training was given on safely disposing of unexploded ordnance (UXO) and detonating booby traps. Defense against nuclear, biological, and chemical (NBC) weapon threats was also included in the training schedule. To make the training at Camp Shelby as realistic as possible, simulated Iraqi villages were carved into the lush fields in a section of the training site. Trained role players acted as villagers, milling about and speaking Arabic. Adding to the sense of reality, the women covered their heads with scarves while some men toted AK-47s.

For additional training, the entire unit went to the National Training Center (NTC) at Fort Irwin, California, to prepare for its upcoming mission in Iraq. NTC is the only instrumented training facility in the world that is suitable for force-on-force and live-fire training. This training helped ensure that Soldiers were adequately prepared to deploy into a combat theater. The training received simulated the tempo, range, and intensity of current and future conflicts. The depth and width of the battlespace gave the 861st the unique opportunity to exercise all of its elements in a realistic environment. The unit's training included the requirement to communicate over extended distances, exercise casualty evacuation, and navigate in difficult terrain with few distinguishable roads. Other environmental conditions, such as a daily temperature range of 40 to 50 degrees, winds over 45 knots, and constant exposure to the sun helped prepare the Soldiers of the 861st for what to expect upon arriving in Iraq.

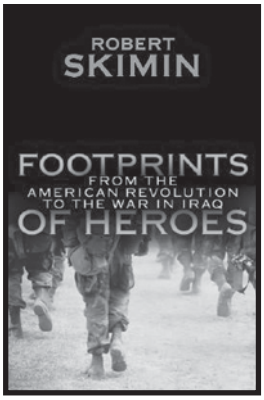
Soldiers of the 861st Engineer Company train to locate and destroy landmines and other explosive devices.

The training at Camp Shelby helped the 861st Engineer Company unit go from working behind the lines to the front lines, clearing the way for the rest. And the training at NTC stressed every system and each Soldier to their limit, allowing the Soldiers to assess their endurance level and how prepared they were—physically and mentally—to go into combat.

Sergeant Cervone is a public affairs specialist with the Rhode Island National Guard.

Book Review

By Mrs. Susan Groth



Footprints of Heroes: From the American Revolution to the War in Iraq by Robert Skimin. Prometheus Books, Amherst, New York, 2005, 328 pages, ISBN 1-59102-281-9, list $26 (hardcover).

"The word hero became practically a dirty word during and after the Vietnam conflict. The same was true for patriotism. Together the words were castigated and nearly removed from popular lexicon. Athletes and rock stars were presented as heroes, even if the most heroic act they ever performed was staying out of jail, maligning the true meaning of the word for our young."[1]

We live in a society that is inundated by the media and popular culture and—as a result—influence our personal, political, religious, and ethical beliefs. As Robert Skimin asserts in the above quote from his book *Footprints of Heroes: From the American Revolution to the War in Iraq*, they have also influenced society's image of the hero. Too often, the word *hero* comes with an image of cultural idols. For many of our youth, heroes are measured by the number of albums sold or the number of sports records broken, not by the true measures of heroism—courage, honor, pride, responsibility, and most importantly, self-sacrifice. It took an infamous act—11 September 2001—to remind America that freedom is a gift that must be earned and appreciated, and with this reminder the image of the hero resurged. We were reminded that those who sacrifice themselves for our freedom every day, and who too often are forgotten or taken for granted, are the true heroes of our society—our firefighters, our policemen, and of course, our military heroes.

In his book, Skimin takes a unique look at military heroes throughout history, many of whom are unknown to most people. Through anecdotes and vignettes, Skimin tells the stories of the heroic acts of these military men and women. Skimin revisits the lives of our well-known heroes, such as George Washington, Ulysses S. Grant, Theodore Roosevelt, George S. Patton, Douglas MacArthur, Audie Murphy, and John McCain, just to name a few. And while it is important to know and be reminded of their accomplishments, the stories that stand out and overpower this book are the stories of the men and women whose names are not remembered or recognized for their heroic acts, such as the average Soldier of the Revolutionary War, the farmer who put aside his responsibilities at home to take up arms for freedom, the drummer boys who beat cadence and orders in the Union Army, and the nurses who worked on the battlefields. Even Bob Hope, who brought laughter to American troops through every conflict from World War II to Desert Storm, is paid tribute to in this book. Throughout military history, there have been thousands of unknown heroes who put aside their personal needs in order to provide us with the freedom that we enjoy today—people without whom our well-known heroes and leaders would not be known. For in the words of General Norman Schwarzkopf, "It doesn't take a hero to order men into battle. It takes a hero to be one of those men who goes into battle." [2]

And who could forget our engineer heroes. The paths cleared by the Army engineers throughout history brought victory and made heroes out of average men and women. Engineers have played an integral part in the fight for freedom. Engineers like those who took a struggling South Vietnam and constructed the ports of Cam Ranh Bay, Nha Trang, Qui Nhon, Vung Tau, and Vung Ro. Engineers who constructed millions of storage facilities, miles of roads, millions of square yards of airfields and heliports, and numerous base camps during conflicts. And certainly Skimin did not neglect to pay tribute to Sergeant First Class Paul R. Smith of Bravo Company, 11th Engineer Battalion, whose actions killed 20 to 50 enemy soldiers, allowing our wounded Soldiers to be evacuated and saving surrounding elements and possibly 100 American lives. His heroic actions were recognized on 4 April 2005, when he became the first service person in Operation Iraqi Freedom to be awarded the Medal of Honor—*Lead the Way*.

If there ever was any question as to what defines a hero, *Footprints of Heroes* answers that question. Skimin—a former paratrooper, Army aviator, and artillery officer—presents American military history through the lives of its heroes. Although his story does not overlook the famous, it is mostly about the ambiguous, unknown fighting men and women of yesterday and today. It is a tribute to those who sacrificed for us, and it serves as a source of inspiration for us and for future generations of heroes.

Endnotes

[1]Robert Skimin. *Footprints of Heroes: From the American Revolution to the War in Iraq*. Prometheus Books, 2005.

[2] H. Norman Schwarzkopf, Peter Petre, editor. *It Doesn't Take a Hero: The Autobiography of General H. Norman Schwarzkopf*. Bantam, 1993.

Mrs. Groth is an instructional design specialist Department of the Army intern, working with the Directorate of Common Leader Training, United States Army Maneuver Support Center, Fort Leonard Wood, Missouri. A former contributing editor for Engineer, she holds a bachelor's and master's in English from Cameron University and is currently working on a master's in learning systems design and development from the University of Missouri-Columbia.

Photo by Sergeant First Class Pete Quinton

A Bridge Recovery Mission in Iraq

By Sergeant First Class Pete Quinton and Second Lieutenant Maureen Wells

The 1438th Engineer Company (Multirole Bridge), Missouri Army National Guard, recently was tasked to recover (delaunch) a Mabey-Johnson Compact 200 Bridge System spanning a canal on an alternate supply route in Iraq. This was the unit's first recovery mission of this magnitude. The 1438th was introduced to this bridge system while on mobilization training at Fort Leonard Wood, Missouri, and gained additional technical training from members of the Marine company it replaced in Iraq.

The recovery mission was based entirely on the unit's knowledge of construction. Army National Guard Soldiers are unique in that they possess civilian skills and expertise in a myriad of fields. The applicability of these skills has played an integral role in the success of this unit. The crew chiefs were instrumental in the evolving technical development of the recovery plan, along with the other senior leadership, who led the unit's technical development by analyzing construction methods to accomplish the recovery successfully.

Effective tool designs and skills in machining and welding proved to be the most valuable assets in the endeavor. The unit developed a push-pull bar assembly that attaches to the transom of the tail bay and connects to a piece of heavy equipment—an excavator, a dozer, or a common bridge transporter—which is used to push or pull steel over a gap. The members of the support platoon not only provide heavy equipment and maintenance support but also welding and machinist skills while on-site. These are all essential skills to any bridge mission.

As the unit arrived on-site, its first task was to establish force protection. Simultaneously, the noncommissioned officer in charge (NCOIC) and platoon sergeant began directing and staging equipment and assigning details in order to occupy the area of operation. The work began immediately with teams preparing for 24-hour operations.

Photo by Sergeant First Class Pete Quinton

A soldier from the 1438th Engineer Company cuts stubborn bolts with a cutting torch.

Photo by Sergeant First Class Pete Quinton

After successfully pulling the bridge across the canal, it is now ready to dismantle and load.

Members performed earthwork and prepared to dismantle the bridge—removing deck bolts, staging cribbing and rollers, placing jacks to lift the bridge off its bearings, and preparing construction of the launching nose. The entire mission was accomplished in less than 72 hours.

The bridge crews worked long shifts, and the work was very physically demanding. Teamwork, unity, and a common objective were essential in a mission of this magnitude. But successfully accomplishing the mission instilled a sense of pride, which is the essence of this bridge unit.

Sergeant First Class Quinton is assigned to the 194th Engineer Brigade Public Affairs Office.

Second Lieutenant Wells, the leader of 2d Platoon, 1438th Engineer Company, was in charge of the bridge recovery mission, which was performed from 7-14 March 2005 .

Photo by Sergeant First Class Pete Quinton

Soldiers stack decking from the dismantled bridge on a truck.

Unit of Action Reconnaissance Sergeant

By Staff Sergeant Andrew J. Way

My assignment as a reconnaissance sergeant to the 10th Mountain Division is the first time the unit has had a combat engineer assigned organically to the staff as part of the S-3 section. Because of this, I have been given the freedom to write and define my own job and have set the groundwork for future combat engineers to step in and fill the reconnaissance sergeant position. This article is an overview of my duties and responsibilities and the lessons I have learned while assigned to this position.

Since I am organic to the battalion, the staff has relied on me to plan their engineer support operations. This makes it very convenient for the S-3 and assistant S-3 to get answers quickly and to better include engineers in the scheme of maneuver. Previously, the platoon leader, acting as the task force engineer, was the main component for answering the task force's questions and assisting in planning. In this sense, I've become the deputy task force engineer. A primary concern I have had with this is that the infantry does not prioritize tasks the same as engineers. My unit, the 87th Infantry Battalion, is very responsive to my input concerning engineer system incorporation and operational needs. This must be communicated in a clear and concise manner, which is something that we as staff engineers need to master. It is important that competent staff sergeants are placed in this position in order for the infantry to develop a positive attitude toward engineers as a force multiplier.

During the military decision-making process (MDMP), my primary job is to assist the S-2 in his analysis. In addition, depending on the availability of the task force engineer, terrain analysis is one of my areas of responsibility. I also assist with or write the Engineer Annex to the operations order.

During operations, I'm responsible for tracking route status, improvised explosive devices (IEDs) found or detonated, engineer assets on the battlefield, implementation of engineer assets, force protection, and reverse Battlefield Operating Systems (BOSs). Another area that leads to success is knowing things that the average combat engineer might not be familiar with. These include the rise and fall of low-water crossings, the amount of power required to run a forward operating base (FOB) or a local village, the amount of spoil required to fill HESCO® Bastions, and the number of HESCO Bastions required to build fortifications or walls. Additionally, it is beneficial to be familiar with the newest digital Army systems.

In this job, you must display the professionalism and expertise associated with the Engineer Regiment daily. You must also be able to think on your feet. For example, when the task force S-3 asks you how to reduce the blast radius of a simulated IED, you must have an answer for him. In this particular instance, I have developed a system that has now become the division standard for simulated IED strikes.

While deployed to the Joint Readiness Training Center, Fort Polk, Louisiana, where we implemented the newest unit of action (UA) system with all the pieces together for the first time, I learned several lessons. The first lesson is that you're not guaranteed an engineer platoon leader since the engineers belong to the brigade and not directly to the task force. Therefore, you need to automatically plan on being the engineer who will be on the ground with the task force. What you need should be planned and resourced before you depart for training or combat. Ensure that you have an assigned area to work in the tactical operations center (TOC). You should also include your job description and duties in the tactical operations center standing operating procedures (TOCSOP). I recommend adding the following to the TOCSOP:

Reconnaissance Sergeant

- Advise the commander.
- Track the status of all routes.
- Coordinate, track, and make recommendations on force protection measures.
- Assist the S-2.
- Oversee the cache collection point.
- Track enemy IED activity.

Within the TOC, I was required to track current operations, plan for future operations, and provide technical expertise and assistance with force protection on the FOB. Within the FOB, there will be a cache collection point for captured enemy supplies and equipment. Various ideas have been expressed about the responsibility of the engineer on the ground and the requirements for this storage area. As a force protection measure, it is in the best interest of the task force to ensure that an engineer or explosive ordnance disposal (EOD) technician routinely checks the storage of items and—prior to implementation of the site—inspects it to ensure proper storage. All items need to be treated with the same care as is given to friendly munitions. An inventory should be kept and continuously updated. Prior to execution, a plan should be put in place that details individual responsibilities. I am currently writing an SOP for my unit for this operation.

As an engineer assigned to this position, it is vital that you are not assigned to fill one of the previous roles established in the S-3 shop. I have seen other battalions use their engineer as the land and ammunitions noncommissioned officer (NCO). This doesn't allow that individual to assist the battalion and task force engineer with the MDMP. His expertise as an engineer is not being implemented. The position and title on the modified table of organization and equipment (MTOE) is *reconnaissance sergeant*. I always try to keep that in mind when I accept a new responsibility. In order to keep my job separate, I have had to be very selective in my acceptance of responsibilities. I work for the S-3 and the S-3 noncommissioned officer in charge (NCOIC)—not for the engineer company. Otherwise, I have been given lots of freedom to develop the duties and responsibilities of the reconnaissance sergeant position.

I hope that this information will help fellow engineers who fill this position. I look forward to hearing from other engineer reconnaissance sergeants who may have developed additional tactics, techniques, and procedures. They may have better ideas or better ways to implement the engineer into the battalion operations cell. When I hand this job off to the next NCO, I want him to know his duties and responsibilities and be able to succeed in the position.

Staff Sergeant Way is the reconnaissance sergeant for 1-87th Infantry Battalion, Fort Drum, New York. He has served as a squad leader and team leader in the 41st Engineer Battalion, Fort Drum; and squad leader and assault section sergeant, 40th Engineer Battalion, 1st Armored Division, Baumholder, Germany. He has deployed to both Kosovo and Iraq. A graduate of the Primary Leadership Development Course, Basic Noncommissioned Officer Course, and Sapper Leader Course, he is working on a degree in business management.

The New Cavalry Leader's Course

By Major Matthew A. Dooley

The challenges of the U.S. Army's force modular redesign are upon us, and we are addressing the necessary changes with the grim, professional determination of an Army at war. Our efforts to make units of action (UAs) a reality have demanded some fundamental shifts in our thinking about how brigade combat teams (BCTs) are organized and how they are expected to fight. The role of cavalry has not been spared this reexamination. One of the latest efforts to ensure that the Officer Education System at Fort Knox, Kentucky, remains current and relevant is the Armor School's recent redesign of the Cavalry Leaders Course (CLC).

As we change our force structure, so must we also reconfigure our assumptions about who should attend the CLC. The combined arms philosophy that underpins the logic behind creating UAs demands that all officers, regardless of branch, who are assigned to the BCT (UA) planning staffs or to the reconnaissance squadrons within these brigades, understand reconnaissance and security operations. Leaders who attend the CLC are provided with the in-depth knowledge of reconnaissance and security, as applied to the new reconnaissance squadrons found in the heavy brigade combat teams (HBCTs), infantry brigade combat teams (IBCTs), and Stryker brigade combat teams (SBCTs). The CLC accomplishes its learning objectives through challenging practical exercises that test and hone the students' understanding of doctrine; tactics, techniques, and procedures; organizations; missions; capabilities; and limitations of reconnaissance, surveillance, and target acquisition (RSTA) and reconnaissance squadrons.

The Armor School encourages CLC enrollment for all Armor officers and extends an invitation to leaders in Infantry, Field Artillery, Engineer, Aviation, Military Intelligence, and Signal Corps Branches who are assigned as planners or commanders of RSTA/cavalry organizations in the UAs. Attendance at CLC is open to graduates of any officer career course in the grades of first lieutenant (P) through major. Enrollment is available through the Army Training Requirements and Resources System (ATRRS).

The Web site for the course is at <*http://www.knox.army.mil/school/16cav/octeam.asp*>. Once you are there, click on "Student Info," then "Cav Leader (CLC)." The point of contact is Major James Turley. He can be reached at <*james.turley@knox.army.mil*> or (502) 624-1324 or DSN 464-1324.

Major Dooley is a former Cavalry Leader's Course instructor/officer in charge.

Engineer Mobile Training Team

Standing Up the Afghan National Army Engineering School

By Captain Eric G. Nichols

An engineer mobile training team (MTT) comprised of United States Army Reserve Soldiers was deployed in support of Operation Enduring Freedom, with a mission of building the new Engineering Corps of the Afghan National Army (ANA). The primary objective of the MTT was to train the ANA soldiers in basic combat engineer skills during a six-week advanced individual training (AIT) and to provide refresher training to the previous American-trained engineering support companies of the ANA. The secondary objective was to train the trainers by mentoring and guiding the ANA instructors with a modified program of instruction (POI) from the United States Army Engineer School (located at Fort Leonard Wood, Missouri).

Coalition activities on a Romanian qualification range

This POI was custom-tailored to meet the needs of the ANA with an emphasis on mine warfare, basic demolitions, and combat construction (focused on wire obstacles and survivability positions). This MTT directly assisted in establishing the first ANA Engineering School (based on the United States Army Engineer School). At the time this article was written, ANA instructors were conducting all student instruction, which is a positive sign that soon the new school will be able to operate without U.S. support.

Mission Preparation

The MTT began the mission by conducting Soldier readiness processing for two weeks at the continental United States (CONUS) Replacement Center, Fort Benning, Georgia. Upon completion, the MTT visited the United States Army Engineer School for two weeks where the team had an opportunity to meet with former MTT members. These Soldiers did an outstanding job of preparing the team for what to expect from the ANA.

The team then returned to Fort Benning for final preparations and deployed on 8 November 2004. They arrived at Bagram Airfield in Afghanistan during the predawn hours of 10 November. While waiting for transportation, the team could hear explosions in the distance and became fully aware that they had indeed arrived in a hostile-fire area. Loading into the back of a 5-ton cargo truck, they began the trip to the training destination.

As the team left the airfield, they saw the first of many minefields along the side of the road. Scattered among the minefields were derelict T-62 tanks, remnants of past conflicts. Traveling through the outer gate of the airfield, the team entered a village that consisted of mud and stone buildings that bear the scars of decades of war. The landscape was desolate and barren and marked with hull defilade armor fighting positions and troop trenches. It was clear that warfare had been a way of life for the Afghan people for many years.

The remains of a maintenance shop in a former Taliban headquarters

The MTT spent the first month setting up quarters (general purpose [GP], medium, tents) at the camp where they were assigned. They inventoried training sets and prepared to instruct the first ANA class.

Training

The first training mission was at an ANA garrison, where the MTT conducted refresher training for two ANA engineering companies. From 11 December 2004 to 8 January 2005, the students (officers and noncommissioned officers [NCOs]) were very attentive and eager to learn. Classroom discipline was maintained by the leadership of each company, creating a positive learning environment. When outside training was conducted, the ANA students marched with great pride to their respective training areas. To bring additional honor to both units, a few were selected by the ANA leadership and the MTT to become student instructors. These students had the distinct privilege of training their fellow classmates, thus making the ANA more self-reliant.

During the two weeks prior to the next refresher training, which began on 24 January 2005, the team met its new ANA counterparts and integrated them with the engineer POIs. From the first day of class, ANA members served as assistant instructors for every class.

Due to the large volume of students, the company was divided into two groups, and a rotational class schedule was established. On the first day of the cycle, U.S. Soldiers served as primary instructors while ANA instructors took notes. On the second day, the ANA instructor became the primary instructor. At the end of each class, the U.S. instructors conducted a review to ensure that the ANA students understood the lesson that had been taught.

The refresher training program gradually evolved to where an ANA instructor taught with a U.S. instructor present, while another ANA instructor rehearsed for the next day's class with another U.S. instructor. By the midpoint of the training, additional instructors had joined the training cycle. And by the end of the refresher training, the ANA was spending more time instructing than their U.S. counterparts. The earlier policy of selecting exceptional students from the class to become student instructors continued.

While instruction to the ANA engineering support companies was being conducted, a U.S. instructor began writing the training support packages (TSPs) for the military occupational specialty 21B combat engineer course. He wrote 32 TSPs, of which 17 required a visual-guided training package for support. The entire course was completed electronically on 2 February 2005. Once the TSPs were completed, the instructor supervised the interpreters in the translation from English to the Dari language.

On 26 February 2005, the MTT began teaching the first 21B AIT course. The refresher training gave the ANA instructors an opportunity to see and use the course material; they were now ready to conduct training with minimal assistance. Because the AIT POI contained some new and previously untaught material, the U.S. instructors continued with the rotational cycle, leaving time for instructor rehearsals of the

An old Soviet T-34 tank along the training center range road

new material. During AIT, the ANA instructors always served as the primary instructors. The ANA instructor corps continued to grow, and on 30 March 2005, they single-handedly conducted the graduation ceremony.

Final Phase

After the AIT graduation, the MTT began preparations for disengagement. During the first week of April, the team conducted a Total Army Instructor Training Course (TAITC) for the ANA instructors. The purpose of the TAITC was to ensure that the ANA instructors were teaching from the TSPs that had been prepared for them in February. The class also introduced the ANA instructors to new techniques for improving future classroom instruction. At the end of the course, all the new instructors had shown remarkable improvement.

During the second week of April, the MTT and ANA instructors conducted an inventory of the classrooms, training-aid containers express (CONEXs), and the office space. By the third week of April, the MTT had completed a handover to the ANA. The ANA team leader now had full accountability for the entire ANA Engineering School.

Conclusion

The MTT was blessed and fortunate enough to stay out of harm's way. Though not making the media headlines as often as Iraq, Afghanistan still presents a great deal of danger for our Soldiers. During the team's six-month stay in Afghanistan, reports were heard of improvised explosive devices (IEDs) exploding on the road that the team traveled every day, and once they convoyed past several IEDs fashioned from old mortar rounds. Team members observed local nationals burying mines in the roadway, resulting in the marking-off and securing of the area.

While the MTT was fortunate, the camp where they were located experienced the devastating loss of four Soldiers who were conducting a range reconnaissance. These Soldiers lost their lives after their vehicle ran over an old Soviet antitank mine. The mines and unexploded ordnance (UXO) left behind by the Soviet occupation are unbelievable. Every time a major rainfall occurs, more mines are revealed. During the freeze-and-thaw cycles of winter, the frost heaves push up new dangers. Two ANA personnel lost their feet after stepping on antipersonnel mines in their "cleared" training area. To help alleviate the problem, the MTT expanded its mission into explosive ordnance disposal and disposed of 13 UXO, 100 badly decayed claymore-type mines, and about 30 pounds of old Soviet-style composition cyclotrimethylenetrinitramine-4 (C-4) and trinitrotoluene (TNT).

In final review, this engineer MTT –

- Trained ANA personnel to become engineers or to improve their engineering skills.
- Trained and mentored ANA instructors (officers and NCOs).
- Established the first "post-Taliban" ANA Engineering School.

The MTT played an active role in Operation Enduring Freedom by helping to ensure that the ANA can bring safety and security to their own country by keeping insurgents and terrorists from finding safe harbor in Afghanistan.

Captain Nichols serves as the executive officer and S-3 of the 1st Battalion, 3d Brigade, 80th Training Division, Regional Training Site-Engineer (RTS-E), Camp Dawson, West Virginia.

Iraq and the Scoop on Sandbags

By Ms. Dana L. Finney

For shoring up a river bank to stem flood waters, the idea is to use sandbags that will eventually disintegrate so they won't have to be retrieved. But when sandbags are going to be used to fortify a base camp in Iraq, they need to stay intact as long as possible. Sandbag materials differ in their resistance to the elements—especially ultraviolet radiation. In response to reports that sandbag fortifications have failed under the intense sunlight in Iraq, the United States Army Engineer Research and Development Center (ERDC) conducted a study to identify which materials maintain tensile strength the longest under ultraviolet radiation exposure. Tensile strength is the property most closely associated with the material's integrity and—when weakened—allows the bags to break, and sand spills out.

In a simulated desert climate, ERDC's Construction Engineering Research Laboratory (CERL) found (through independent, certified laboratory testing) that cotton duck material performs best. Acrylic sandbags also performed well in the study. The complete report with test data is available at <*http://www.cecer.army.mil*>. For more information, contact Alfred Beitelman or Charles Marsh at CERL, 800-USA-CERL.

Ms. Finney is a public affairs officer for the United States Army Engineer Research and Development Center, Construction Engineering Research Laboratory, Champaign, Illinois.

These sandbags, used for fortification in Iraq, failed due to extreme exposure to ultraviolet radiation.

Coyote Engineers Support CJTF-76

By Colonel Nancy J. Wetherill

When U.S. forces entered Afghanistan to strike Al Qaeda training camps and Taliban military installations in early October 2001, the world witnessed unconventional applications of military force. Well-trained troops operating complex weaponry—supported by the latest technology—hammered deadly blows against a tough and elusive enemy. Yet, intermingled with the sophisticated gear and tactics were American Soldiers riding horses onto the battlefield.

Contradiction? No, that mixture of new and old remains a reality for U.S.-led coalition tactical forces as they continue to neutralize terrorist organizations and help Afghan citizens rebuild their Texas-sized nation—a landlocked and resource-poor country that has endured an unfair share of misery. Likewise, military engineers involved throughout Operation Enduring Freedom tackle demanding missions with their own versions of new and old.

Survey instruments guide airfield-design teams to mark the corners of runway concrete forms and roadway grade stake locations with put-it-right-there precision. Hundreds of miles away at a forward operating base (FOB), one or two Soldiers rely on common sense and instinct to lay out a leach field for a shower facility by trusting timeless laws of gravity and plumbing—water flows downhill.

Three years after the first U.S. strikes in Afghanistan, pockets of Taliban, Al Qaeda, and splinter groups remain. Combined Joint Task Force (CJTF)-76 led the U.S. and coalition response during a 12-month cycle that began in May 2004 and continued to take the fight to the enemy in many remote locations. The 109th Engineer Group and its subordinate Army National Guard and United States Army Reserve battalions, plus forces from coalition partner nations, served as the headquarters for the CJTF-76.

Task Force Coyote

The 109th Engineer Group directed and supported engineer operations at more than forty locations. The unit borrowed from its shoulder sleeve insignia and named the task force *Coyote* and provided a quick lesson to everyone that the proper pronunciation for the wily canine's common name is *ky-oat*—never *ky-oat-tee*.

During their year on the ground, Task Force Coyote engineers worked from a couple of airfields and scores of remote sites. Missions included—

- Airfield and rotary-wing ramp expansion, repair, and maintenance.
- Base camp, facility, and infrastructure construction and sustainment.
- Electrical, water, and sewer systems design and installation.
- Construction contracting.
- Quality assurance/quality control (QA/QC) for local national construction.
- Mine clearing, demining, and route clearing.
- Road construction.

The task force picked up the engineer mission from the 416th Engineer Group. Soldiers of the 65th Engineer Battalion formed the nucleus of the CJ7 (engineer) cell for CJTF-76, and as its parent, the 25th Infantry Division commanded all operations.

Photo by Colonel Nancy J. Wetherill

Afghans travel along the Tarin Kowl road as Task Force Coyote construction crews install culverts and shape the roadway while other Soldiers provide security.

Priority of Engineer Effort

When the 109th Engineer Group arrived in Afghanistan, the engineer effort consisted of mobility, survivability, and general engineering missions. Mobility tasks included airfield expansion, with the construction of parking ramps and rotary-wing parking. Survivability tasks were the construction of guard towers, HESCO® perimeter barriers, and entry control points. General engineering tasks included design and construction of tactical operation centers, dining facilities, latrines, showers, and tent platforms. These priorities are underpinned by mine and unexploded ordnance (UXO) clearance, which is defined as a mobility task but enables the achievement of all engineer priorities.

During the days leading up to and including the Afghan national presidential elections, the engineer priorities were reconstruction, facility upgrade and maintenance, and combat engineering. The reconstruction effort centered on the construction of the Kandahar to Tarin Kowt road, a route that is the lifeline for Afghans in the Oruzgan Province. Engineers at base camps continued to upgrade life-support facilities, and the combat engineer task of mine clearing at the two airfields was in full swing.

After the successful presidential elections, CJTF-76 transitioned to operations intended to include the period through the national parliamentary elections. The priority of

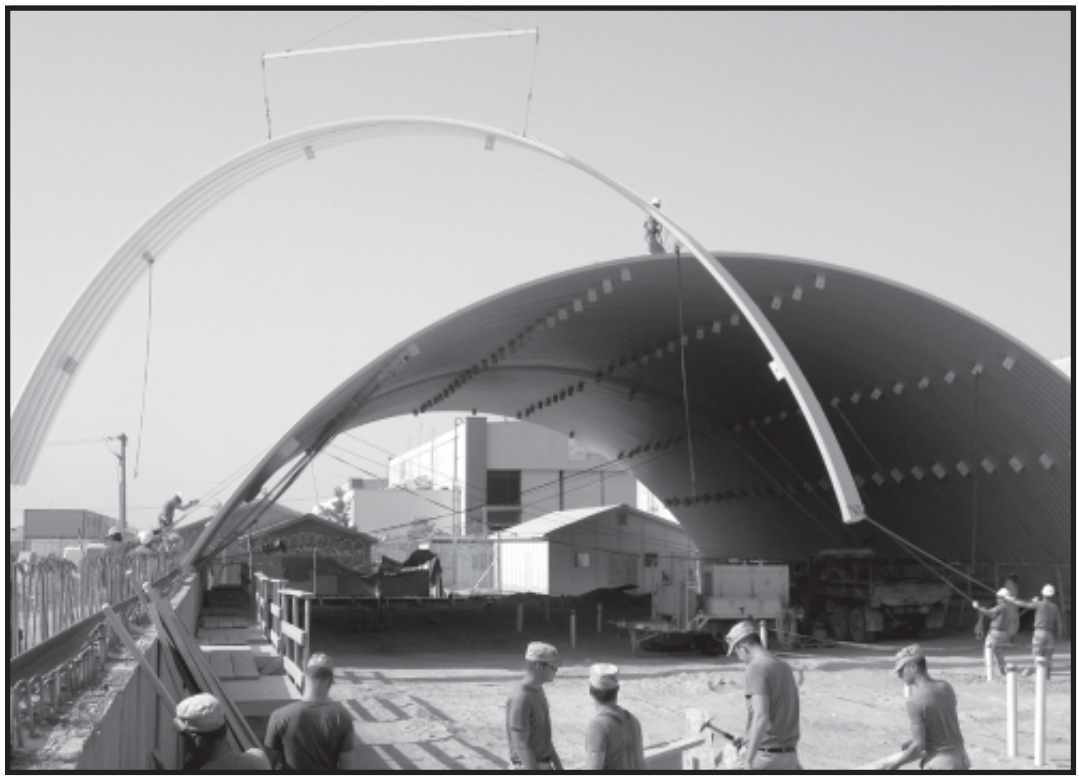


Photo by Colonel Nancy J. Wetherill

This K-Span panel section for the Bagram Detainee Facility is guided into place with the help of a crane and Soldiers with tether ropes.

Photo by Colonel Nancy J. Wetherill

A Soldier from a military mine dog detachment works with his dog to find and mark potential explosive devices.

engineer effort became reconstruction, mobility, and survivability. In addition to airfield expansion, mobility tasks now included repairing secondary roads, which were lines of communication to outlying camps.

Provincial Reconstruction Teams

The Provincial Reconstruction Teams (PRTs) extend the reach of the Afghan government by taking its influence beyond its national capital in Kabul. PRTs are stabilizing factors that help Afghans rebuild roads, drill wells, and construct schools and police stations, while establishing security in the region.

The U.S.-led PRT initiative builds relationships with the Afghan people, provides needed infrastructure development, and improves quality of life. PRTs are intended to bring security to the sites where they are located. The teams consist of infantry, civil affairs, engineer, medical, logistical, and United States Aid for International Disasters (USAID) personnel and Afghan security forces.

Task Force Coyote was responsible for the stand-up of four PRTs, which involved construction of facilities through contracts with local Afghan companies. The task force was also responsible for the QA/QC of the construction and served as the engineer representatives at six PRT sites.

Mine-Clearing/Demining

Military mine-clearing operations consisted of area and route clearance. Standard demining and mine-clearing methods were used to destroy mines and UXO. U.S. military mine clearers adopted the demining technique but left the mine/UXO retrieval and disposal to the Polish or RONCO Consulting Corporation (an international firm specializing in humanitarian demining assistance). RONCO's dogs and the U.S. military mine dog detachment shortened the time needed to proof an area that had been reduced by mechanical means.

The current inventory of mine-clearing equipment used by the Army, coalition forces, and RONCO is state-of-the-art. Mechanical equipment has proven to be very resistant to mine and UXO strikes, protecting Soldiers and limiting damage to equipment.

During their occupation, Soviets placed a number of protective mine lines around major installations. These lines are marked, making them easily identifiable. The Soviet mine-laying technique is predictable, with a discernable pattern; however, the Northern Alliance and Taliban fighters reseeded many of the mines, leaving no documentation. Their lack of mine emplacement knowledge adds to the danger for military mine clearers.

Road Construction

The construction of the Kandahar to Tarin Kowt road marked the first major U.S. military road construction in Afghanistan. The road—from Kandahar City through the Hindu Kush Mountains to the city of Tarin Kowt—was a joint effort with USAID, the United Nations Office of Project Services (UNOPS), and the U.S. military. USAID provided the funding; UNOPS contracted the placement of base course material and double bituminous surface treatment (DBST); and Task Force Coyote did the surveying, the placement of culverts, and the construction of the roadbed to the subbase surface.

The first base camp, FOB Tiger, was constructed in two weeks. Work was performed throughout the year by a company-plus of combat heavy engineers. Security was provided by troops from the 3d Brigade, the 25th Infantry

Photo by Colonel Nancy J. Wetherill

Soldiers of Task Force Coyote construct concrete forms in preparation for placement of concrete to increase aircraft parking space at Bagram Airfield. In the background, the dust flies as crews work ahead of the concrete placement group.

Division, and Afghan security forces. The region is considered a birthplace of the Taliban, and remnant fighters remain in the area. By mid-November, FOB Tiger was moved farther down along the road, and no enemy contact occurred after an initial attack.

Challenges

As a landlocked country, Afghanistan has few roads and even fewer paved highways, so moving troops, equipment, and materials is a challenge in itself. Local national transportation support was used for surface movement of supplies and equipment from the Port of Karachi, Pakistan, and in and around the combined joint operation area. It could take weeks for items to arrive, and worker strikes at the port were common, sometimes delaying shipments for months. United States Air Force aircraft and a global delivery service ferried some critical items.

On occasion, insurgent attacks on civilian Afghan delivery trucks (known as *jingle trucks* because of the decorative metal tassels hanging from the bottom of the truck frames that jingled when the trucks moved) resulted in damaged or destroyed equipment. In some areas of the country, the jingle truck drivers would request U.S. escort through known trouble spots.

The shortage of plumbing and electrical supplies and good quality lumber often caused long delays in completing missions. Non-U.S. plywood is very flimsy—sometimes requiring a doubling of materials to meet standards. Electrical and plumbing materials just did not exist in Afghanistan, so as an expedient partial solution, a team was sent to Germany to locally purchase the needed items.

Accomplishments

In spite of the challenges Task Force Coyote personnel faced, they were able to accomplish several significant missions:

- Construction of parking ramps and the rotary-wing parking at the two airfields were the largest concrete missions. But before the concrete could be placed, mine clearing and extensive site preparations were required.
- Two detainee facilities were the largest buildings constructed. The facilities included showers, toilets, administrative offices, and community and isolation cells.
- Base camp construction and upgrades consumed many hours of labor, resulting in the construction of more than 150 tent platforms on 45 separate base camps and more than 85,000 square feet of administrative buildings.
- With the use of U.S., Polish, and RONCO personnel, more than 627 acres have been reduced and 508 acres proofed. The occasional mine strike on mechanical equipment did not result in any injury to personnel.

Conclusion

The Operation Enduring Freedom mission for this engineer group headquarters was nearly textbook in its task organization and operation. The CJTF-76 commanding general allowed Task Force Coyote to effectively use engineer assets throughout the combined joint operation area. Keeping engineer units under the control of an engineer headquarters maximized engineer capabilities available to the command. Coyote engineers from five countries came together for a common cause. They maintained flexibility, while executing thorough staff planning. The result: An overwhelmingly successful, 12-month engineer mission.

Colonel Wetherill is the commander of 109th Engineer Group (Combat), South Dakota Army National Guard, and served as the commander of Task Force Coyote. Previous assignments include commander of the 109th Engineer Battalion, State Public Affairs Officer, and commander of the 129th Public Affairs Detachment. She is a graduate of the Army War College and holds a master's from South Dakota State University.

ENGINEER UPDATE

Commercial numbers are (573) 563-xxxx and Defense System Network (DSN) numbers are 676-xxxx unless otherwise noted.

Urban Mobility Breaching Course (UMBC). The UMBC is a 3-week course conducted at Camp Lejeune, North Carolina, by the United States Marine Corps, with assistance from three United States Army engineers. Two weeks of the course are consolidated training, and the remaining week is Army-unique. The maximum Army course load for the UMBC is 15 students. Slots for the course can be reserved through the Army Training Requirements and Resources System (ATRRS).

The UMBC provides advanced information on urban breaching operations. The course consists of in-depth explosive theory; detailed planning that combines operational and training safety issues; urban reconnaissance; and employment of urban breaching assets, including explosive, manual, and ballistic breaching techniques for urban operations. The UMBC teaches the use of Current Force equipment that supports mobility operations in support of the maneuver force.

Students must meet requirements listed in Department of the Army Pamphlet 611-21, *Military Occupational Classification and Structure,* and Army Regulation 600-9, *The Army Weight Control Program;* be a combat engineer noncommissioned officer in the grade of E-5 (P) through E-7 and a graduate of the combat engineer Basic Noncommissioned Officer Course (BNCOC); have no pending Uniform Code of Military Justice (UCMJ) actions; and have no limiting profiles.

Fiscal Year 2006 Class Schedule		
Class Number	Report Date	Graduation Date
01-05	16 Oct 05	4 Nov 05
02-05	27 Nov 05	16 Dec 05
03-05	22 Jan 06	10 Feb 06
04-05	26 Feb 06	17 Mar 06
05-05	4 Jun 06	23 Jun 06
06-05	13 Aug 06	1 Sep 06
07-05	10 Sep 06	29 Sep 06

The point of contact for this course is the Directorate of Training and Leader Development (DOTLD) Sergeant Major at (573) 563-4094, or e-mail <*atsedot@wood.army.mil*>. *The* DOTLD Web site is at <*http://www.wood.army.mil/dotld/*>.

New Mission Training Plans (MTPs). The following Army Training and Evaluation Program (ARTEP) MTPs will soon be available on the Army Training Information Architecture (ATIA) Web site at <*https://atiam.train.army.mil/*>:

ARTEP 5-063-10-MTP, Mission Training Plan for the Mobility Platoon, Engineer Company, Brigade Combat Team

ARTEP 5-063-11-MTP, Mission Training Plan for the Mobility Support Platoon, Engineer Company, Brigade Combat Team

ARTEP 5-063-35-MTP, Mission Training Plan for the Engineer Company, Brigade Combat Team

ARTEP 5-500-35-MTP, Mission Training Plan for Engineer Companies (applies to the following company-level tables of organization and equipment [TOEs]):

05417G000 (horizontal company)

05418G000 (vertical company)

05419G000 (engineer support company)

05437G000 (clearance company)

05438G000 (mobility augmentation company)

05439G000 (sapper company)

ARTEP 5-500-68-MTP, Mission Training Plan for Engineer Staffs (applies to all engineer staffs except the Prime Power Battalion).

For more information, contact the Collective Training Division at <*joseph.toth1@us.army.mil*> or call (573) 563-7821.

Center for Engineer Lessons Learned (CELL). The United States Army Engineer School 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 CELL can derive information from a variety of sources: unit after-action reports (AARs); tactics, techniques, and procedures (TTP) 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, material, leadership, personnel, and facilities (DOTMLPF) gap analysis and to determine solutions. These solutions are distributed to the Engineer Regiment via new doctrine and training products, the Engineer Professional Bulletin and other publications, Web sites, and by answering RFIs. (The Engineer School RFI Web site provides the Engineer Regiment a reach-back capability.)

You can help by forwarding any of these materials from your unit's deployment to the CELL point of contact. Unclassified information can be sent by e-mail to <*Doctrine.Engineer@wood.army.mil*> or <*reggie.snodgrass@us.army.mil*>. Classified information can be sent by secret Internet protocol, routed (SIPR) e-mail to <*snodgrassrg@monroe.army.smil.mil*>. For more information, call (573) 563-4117.

Dedication

The following members of the Engineer Regiment have been lost in the Global War on Terrorism since the last issue of *Engineer,* or were inadvertently omitted from a previous list. We dedicate this issue to them.

First Lieutenant Carlos J. Diaz	2d Battalion, 69th Armor Regiment	Fort Benning, Georgia
Sergeant Andrew J. Jodon	3d Battalion, 69th Armor Regiment	Fort Stewart, Georgia
Staff Sergeant Lincoln D. Hollinsaid	11th Engineer Battalion	Fort Stewart, Georgia
First Lieutenant Louis E. Allen	HHC, 42d Infantry Division	Troy, New York
Captain Phillip T. Esposito	HHC, 42d Infantry Division	Troy, New York
Private First Class Seferino J. Reyna	70th Engineer Battalion, 1st Armored Division	Fort Riley, Kansas
First Lieutenant Aaron N. Seesan	73d Engineer Battalion, 25th Infantry Division	Fort Lewis, Washington
Specialist Tyler L. Creamean	73d Engineer Battalion, 25th Infantry Division	Fort Lewis, Washington
Sergeant First Class Michael D. Jones	133d Engineer Battalion	Belfast, Maine
Staff Sergeant Jeffery J. Farrow	146th Quartermaster Company	Fort Totten, New York
Sergeant Larry R. Arnold, Sr.	150th Engineer Battalion, 155th Brigade Combat Team	Lucedale, Mississippi
Specialist Samuel R. Bowen	216th Engineer Battalion	Hamilton, Ohio
Specialist Casey Byers	224th Engineer Battalion	Ottumwa, Iowa
Specialist James D. Carroll	230th Engineer Battalion	Mckenzie, Tennesee
Corporal Randall D. Preusse	386th Engineer Battalion	Austin, Texas
Sergeant Joseph C. Nurre	463d Engineer Battalion	Weirton, West Virginia
Specialist Robert E. Hall, Jr.	467th Engineer Battalion	Greenwood, Mississippi
Specialist Patrick R. McCaffrey, Sr.	579th Engineer Battalion	Petaluma, California
Second Lieutenant Andre D. Tyson	579th Engineer Battalion	Petaluma, California
Staff Sergeant Charles H. Warren	648th Engineer Battalion	Statesborough, Georgia
Private First Class Mathew V. Gibbs	648th Engineer Battalion	Statesborough, Georgia
Specialist Robert G. Davis	864th Engineer Battalion	Fort Lewis, Washington
First Lieutenant Laura M. Walker	864th Engineer Battalion	Fort Lewis, Washington
Private Robert C. White III	864th Engineer Battalion	Fort Lewis, Washington
Sergeant Foster Pinkston	878th Engineer Battalion	Augusta, Georgia
Sergeant David J. Murray	1088th Engineer Battalion, 3d Infantry Division	New Roads, Louisiana

SUBSCRIBE TO *ENGINEER* TODAY

New Subscriptions: Use the subscription form below. Cost for a subscription is $19.00 (domestic and APO/FPO) or $26.60 (foreign).

Renewal Subscriptions: To keep subscription prices down, the Government Printing Office mails each subscriber only one renewal notice. To be sure that your service continues without interruption, please return your notice promptly. If your subscription service is discontinued, simply send your mailing label from any issue to the Superintendent of Documents, ATTN: Mail List Branch, Mail Stop: SSOM, Washington, D.C. 20402, with the proper remittance, and your service will be reinstated.

Address Changes: Please send your mailing label, along with your new address, to the Superintendent of Documents, ATTN: Mail List Branch, Mail Stop: SSOM, Washington, D.C. 20402.

Inquiries About Subscription Service: Please send your mailing label, along with your inquiry, to Superintendent of Documents, ATTN: Mail List Branch, Mail Stop: SSOM, Washington, D.C. 20402. The telephone number is (202) 512-1800.

Subscription Order Form

United States Government
INFORMATION

List ID: TENG

Credit card orders are welcome!
Fax your orders (202) 512-2250
Phone your orders (202) 512-1800

☐ YES, please send_____subscriptions of:
Engineer, The Professional Bulletin of Army Engineers, at $19 each ($26.60 foreign) per year.

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change.

Name or title (Please type or print)

Company name Room, floor, suite

Street address

City State Zip code+4

Daytime phone including area code

Purchase order number (optional)

Check method of payment:
☐ Check payable to: Superintendent of Documents
☐ GPO Deposit Account ☐☐☐☐☐☐☐–☐
☐ VISA ☐ Mastercard ☐ Discover

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
(expiration date)

☐☐☐☐

Authorizing signature

Thank you for your order!

Mail to: Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954

Important: Please include this completed order form with your remittance.

Sergeant First Class Paul Ray Smith

On 4 April 2005, Sergeant First Class (SFC) Paul Ray Smith was posthumously awarded the first Medal of Honor for actions in support of Operation Iraqi Freedom. A combat engineer with Bravo Company, 11th Engineer Battalion, 3d Infantry Division, SFC Smith is the 14th engineer to receive the military's highest award.

Sometimes referred to as the *Congressional Medal of Honor*—because the President awards it on behalf of the Congress—the medal was first authorized in 1861, during the Civil War. Although more than 3,400 Medals of Honor have been awarded since then, they are bestowed only to the bravest of the brave, and that valor must be well-documented.

SFC Smith, who grew up in Tampa, Florida, enlisted in the Army in October 1989 and attended Basic and Advanced Individual Training at Fort Leonard Wood, Missouri. As a sergeant, he became known as a stickler for detail, a trait not always appreciated by his newer troops, who often found themselves doing things over and over again—until they got it right. But SFC Smith had learned from being in the first Gulf War how important it was to train right in order to be prepared for battle.

And because of SFC Smith's discipline, the lives of more than 100 American Soldiers were saved during a firefight near the Baghdad International Airport on 4 April 2003.

On that morning, the engineers were manning a roadblock near the airport when SFC Smith's platoon received a mission to construct a holding area for enemy prisoners in a courtyard next to a watchtower. As the engineers were clearing debris from the courtyard, they were surprised by about a hundred Iraqi soldiers, who opened fire on SFC Smith's men.

Disregarding his own life, and under constant enemy fire, SFC Smith organized a defense against the attack. After seeing that some of his men were wounded and in danger of being overrun, SFC Smith manned a 50-caliber machine gun atop a damaged armored personnel carrier. From a completely exposed position, he fought off the Iraqis, going through several boxes of ammunition and killing as many as 50 enemy soldiers as he protected his men and prevented an enemy attack on the aid station just up the road. SFC Smith continued to fire until he was fatally wounded—the only American to die in the engagement.

Ironically, in the last letter that SFC Smith wrote to his parents from Iraq (but never mailed), he spoke of being prepared to "give all that I am to ensure that all my boys make it home."

According to his wife Birgit, "He loved his country; he loved the Army; and he loved his Soldiers."

"It is an honor to share the title engineer with this great Soldier who exhibited extraordinary courage and selflessness. …All Americans can take pride in the heroism of this great Soldier and leader, and the Engineer Regiment can be especially proud."

Lieutenant General Carl A. Strock, Chief of Engineers

"We count ourselves blessed to have soldiers like Sergeant Smith, who put their lives on the line to advance the cause of freedom and protect the American people. …And we express gratitude for a new generation of Americans, every bit as selfless and dedicated to liberty as any that has gone on before—a dedication exemplified by the sacrifice and valor of Sergeant First Class Paul Ray Smith."

President George W. Bush

Sergeant First Class Paul R. Smith

Medal of Honor

Sergeant First Class Paul R. Smith distinguished himself by acts of gallantry and intrepidity above and beyond the call of duty in action with an armed enemy near Baghdad International Airport, Baghdad, Iraq, on 4 April 2003. ... As the fight developed, Sergeant First Class Smith braved hostile enemy fire to personally engage the enemy with hand grenades and antitank weapons and organized the evacuation of three wounded Soldiers from an armored personnel carrier struck by a rocket-propelled grenade and a 60-millimeter mortar round. ... During this action, he was mortally wounded. His courageous actions helped defeat the enemy attack ... while allowing the safe withdrawal of numerous wounded Soldiers.

PIN: 082635-000