Air Force
CIVIL ENGINEER
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Transforming Civil Engineering

From the Top

Warriors in Action

During a recent visit to Southwest Asia, I saw firsthand how Air Force combat engineers provide phenomenal support to the theater commanders. I'm awestruck by the sheer quantity and quality of work our Airmen accomplish in support of Operations Enduring Freedom and Iraqi Freedom and the Global War on Terror. If there was ever an example of the Total Force concept operating effectively, this is it—the team of active duty, Air Force Reserve, and Air National Guard Airmen, with support from civilians, is truly seamless.

Throughout the trip, we met Air Force civil engineers excelling at their traditional jobs, but also performing non-traditional tasks. From completely integrated RED HORSE/Prime BEEF teams to Army "in lieu of" taskings, our Airmen are answering the call to perform unconventional work under demanding conditions. CE Airmen in the Iraq and Afghanistan Areas of Operations are skillfully executing the full spectrum of combat and combat support missions as members of Facility Engineering Teams, Facility Engineer Design Teams, Utility Teams, Heavy Construction Teams, and EOD Teams. These teams, along with Weapons Intelligence Teams, Provincial Reconstructions Teams, Tailored Logistics Elements, and Civil Affair Teams are shining examples of our CE forces forging new paths on the front lines of joint combat and nation-building operations.

While we are leading the way in the AOR, we must also continue to improve our capabilities. Deployments don't end when everyone returns, but continue with each Airman passing on key "lessons learned." These lessons learned must be integrated into all tenets of our training by institutionalizing Air Force combat training to produce "Battlefield Airmen." In essence, we are making the next deployed warrior better. It is a critical part of improving upon our "warrior culture" where every Airman is a warrior. At the same time, we need to improve our training. For example, we are working with the Army to improve ILO combat training and we're updating home-station training, Silver Flag, and Eagle Flag.

While we continue our war efforts, the Air Force is also in the middle of a major reduction in personnel, and we must reshape civil engineering as we draw down. We recently completed a review of our manning compared to mission requirements and risk levels. We are in the midst of centralizing some authorities to gain efficiencies where it makes sense, and eliminating or realigning positions at all levels of the Air Force to actually improve mission capability. The goal is to ensure that our combat support Airmen are better organized, trained, and equipped to accomplish the mission.

Finally, I want to thank you for your commitment and dedicated service. Do not be modest about your accomplishments. Your family, friends, and neighbors are justifiably proud of your service in securing democracy for our nation and extending that opportunity to over 50 million people in Iraq and Afghanistan. You all are making a tremendous difference in the Global War on Terror, both in CONUS and abroad. Thank you!

Del Eulberg
Major General, USAF
The Air Force Civil Engineer

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Back cover: More than 40 members of the 366th CES Prime BEEF team deployed from Mountain Home AFB, Idaho, in October 2006. The team went to Fort McCoy, Wis., for 30 days of Combat Skills Training before heading out to support Operation Iraqi Freedom. (photo by A1C Dana Hill; treatment by Mr. Guy Ivie)

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The Civil Engineer
Maj Gen Del Eulberg

AFCESA Commander
Col Richard A. Fryer, Jr.

Chief, Professional Communications
Dr. Ronald Hartzer

Chief, Public Affairs
MSgt Paula Allen-Gibbs

Editor
Teresa Hood

Graphic Designer
Guy Ivie

On the cover: Transforming Air Force civil engineering is a complicated process. The gears signify the "machinery" that takes diverse input and produces the final "product"; the complexity of the undertaking; and the cooperation between the various organizations to reach a common goal. (gear image ©iStockPhoto.com/Gregory Spencer; treatment by Mr. Guy Ivie)

Transforming the CE Career Field

Change is never easy, but it is essential if we are to remain the most

Maj Gen Del Eulberg
The Air Force Civil Engineer

When Gen T. Michael Moseley, Chief of Staff, United States Air Force, took office last year, he inherited an Air Force with old weapons systems and an under-funded modernization program, and he directed program funding changes to replace our aging weapon systems. Program Budget Decision 720 reduces our military by 40,000 active duty and 17,000 air reserve component members, and our civilian authorizations by 2,000. This allows us to modernize weapons systems to ensure we remain a relevant fighting force.

PBD720 will bring our manning to the lowest level since we became a separate service in 1947. It sounds scary, especially while we're fighting a war. But here's what's really scary: fighting a war with old, antiquated equipment and weapons systems that don't allow us to maintain air dominance. Reducing manning levels is necessary to ensure that the air arm of our nation's defense remains the best in the world. Our air superiority allows us free access to the skies to support the troops; our space systems protect our use of communication and navigation systems.

In January 2006, Air Force civil engineers began looking at how to absorb and minimize the impact of potential PBD720 reductions. We established two teams, which were directed by Col Tom Quasney: one to conduct a CE military requirements review (Blue Suit Review or BSR) and one to transform the way we do business, ensuring that we continue to provide stellar support to the Air Force with fewer engineers.

Blue Suit Review

The BSR was led by Lt Col Greg Cummings. (Lt Col Cummings previously led a BSR

Members of the 447th ECES's explosive ordnance disposal team unpack C-4 that will be used to detonate a cache of unexploded ordnance recovered from a blast area at the ammunition holding area on Forward Operating Base Falcon, Iraq. (photo by Army Sgt. Jacob H. Smith)

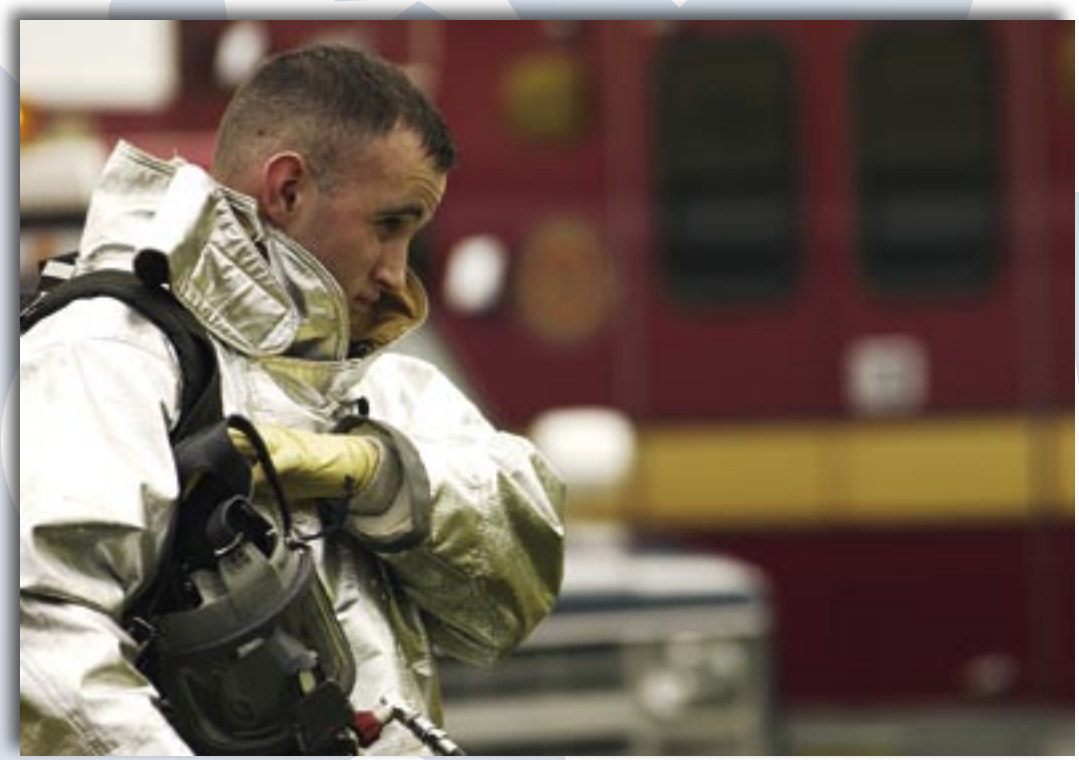
powerful air force in the world.

in the late 1990s based on support to two major theater wars.) The BSR team worked from the then-draft Quadrennial Defense Review with a refined Defense Planning Strategy of 1-*n*-2-1: homeland defense as the number *one* priority; respond to an *undetermined number* of regional conflicts; conduct simultaneous actions in *two* of three major combat operations; and win decisively in *one* of those two MCOs.

The BSR team spent the next five months in the vault at Headquarters Air Force Civil Engineer Support Agency, Tyndall AFB, Fla., combing through all the war plans, time-phased force and deployments lists, and many other documents to determine the right number of personnel required—by Air Force Specialty Code, by Unit Type Code, and by service component—to support our National Defense Strategy. Although not directly tied to PBD720, the BSR validated the number of military engineers necessary to support the war plans. By comparing the number of engineers needed against the number currently authorized, we can better determine where reductions can be made without impacting our warfighting capability. (Note that this doesn't mean we don't need the current authorizations for peacetime, only that the authorizations don't have to be filled by military personnel.) Completed in June 2006, the new BSR has already paid dividends because civil engineers were not asked to take additional cuts beyond the original plan.

Transformation Plan

A second team, led by Lt Col Jeff Todd, looked at transforming our business processes to minimize the impact of PBD720 reductions on expeditionary



SrA Kent McGaha, a firefighter with the 125th CES, Florida Air National Guard, suits up to triage and recover victims during the tri-annual mass casualty exercise at Jacksonville IAP, Fla. (photo by SSgt Shelley Gill)

combat support and peacetime garrison requirements. With a focus on meeting PBD720 reductions while maintaining CE warfighting capability based on requirements identified in the recent QDR, the team developed several initiatives. In contrast to a fair-share distribution, these initiatives target specific realignments for military and civilian authorizations to balance the workload and increase our combat capability for explosive ordnance disposal and RED HORSE. The initiatives also create some "efficiencies," gained from changing processes to allow us to do it with fewer people—military or civilian. Efficiencies created by one initiative may then be used to facilitate another initiative.

When you are through changing, you are through.

Bruce Barton

The first initiative centralizes capital construction execution at a field operating agency. Centralizing management for new and current mission military construction, housing MILCON, and environmental restoration projects at the Air Force Center for Environmental Excellence will relieve major command-level CEs from this responsibility. Currently, the MAJCOMs have over 200 positions managing these programs. AFCEE plans to accomplish the same level of effort with fewer personnel. MAJCOM CEs will still program the requirements, determine the priorities, and advocate for these capital investment programs. Funding will continue to be centrally controlled at Air Staff.

The second initiative changes how we accomplish the fire emergency services support mission. By accepting capability-based risks, CEs can continue providing the same level of service while reducing the numbers of firefighters required on duty during times of low probable events. In doing so, civil engineers will reduce military and civilian firefighters by approximately 14% to meet more urgent engineering requirements. After meeting and evaluating options this past summer, the MAJCOM engineers and fire chiefs agreed with the initiative and began preparing a new firefighting concept of operations to be published in February 2007.

The third initiative models—and builds upon—a successful reengineering effort at Wright-Patterson AFB, Ohio, in which military positions were eliminated under an

Airmen from the structures shop of the 332nd ECES position an arch during construction of a shelter for Hunter unmanned aerial vehicles at Balad AB, Iraq. (photo by A1C Chad M. Kellum)

A76 (most efficient organization) process. Under this third initiative, approximately 600 military positions will be eliminated from civil engineer groups at three bases under Air Force Materiel Command. Some positions will be backfilled using civilian efficiencies gained through the other initiatives. This initiative reduces the impact on numerous civil engineering UTCs throughout the Air Force.

The fourth initiative realigns CE military positions to directly improve EOD and RED HORSE combat capability. The BSR identified a shortage of 159 EOD positions that need to be filled—a factor partially responsible for the nearly 1:1 dwell (deployment:non-deployment) they currently experience. Air Force RED HORSE capability will be strengthened by realigning 318 military positions from Prime BEEF UTCs into RED HORSE squadrons. These 477 EOD/RED HORSE positions will be realigned from the other CE initiatives and CE Air Force specialties.

Finally, the organizational structures at all levels—Air Staff, MAJCOM, and Squadron—will be realigned to centralize the core engineering capabilities. Restructuring will be consistent at all levels, creating a simplified route for needs and information to move between levels—in effect, "lining up the phonebooks." Looking closely at processes and workflows, then combining or streamlining them where possible, will garner civilian efficiencies that enable us to balance the workload with the right resources.

Leading the Way through Change

These initiatives will transform and shape CE for the foreseeable future. Air Staff and MAJCOM leadership concurred with the business transformation plan and implementation has begun. Although we seem to constantly change, some things never change: the outstanding warfighting capability our civil engineers bring to the fight and the extraordinary job our folks do maintaining our base infrastructure at home. Our leaders know it and appreciate it. As we implement these initiatives, rest assured that we will always keep our people first and strive to minimize the potential impacts of this transformation. The true foundation of our capability remains our men and women…and we have the best in the world.

Maj Gen Del Eulberg spoke to the 332nd EOD team at Balad AB, Iraq, while touring some of the forward operating bases and providing important feedback and advice to the men and women of the 332nd ECES. (photo by A1C Chad Kellum)

On the Road Again

A Day in the Life of CMSgt Wayne Quattrone, Chief of Enlisted Matters for The Air Force Civil Engineer

Ms. Teresa Hood
Editor

One day last fall, Air Force Civil Engineer magazine was given the opportunity to spend the day with the Chief of Enlisted Matters for The Air Force Civil Engineer (USAF/A7CM) on a visit to the 316th Civil Engineer Squadron at Andrews AFB, Md.

CMSgt Wayne Quattrone has held the position for a little more than a year now, and has the mileage to prove it. When you add all his trips over the last year together, he's been traveling for about half of it. Six months of "road trips" and more to come.

"It's been a busy year and the only thing that's certain is it won't be slowing down any time soon," said CMSgt Quattrone. "But I love the job and the opportunity to represent our enlisted force. I just can't believe how fast the last year has gone."

Chief Quattrone greets SrA David Kressler, while SrA Kevin Rich and SrA David McCardle wait to meet the chief. All of the Airmen are Electrical Systems Journeymen with the 316th CES. (photo by the author)

Many of CMSgt Quattrone's trips involve his participation in such things as official ceremonies, conferences, and briefings, or even as a member of the Curtin Award team. But some of his more common—and favorite—trips take him to base-level civil engineer units, and this was one of those trips.

"So far I have been to 15 bases to visit CE units," said CMSgt Quattrone, "and although I don't know if it's possible, it would really be great if I could get to all of them during my tenure. We have a trip coming up to the AOR, my first since I've been in this job, and I'm really looking forward to it [see sidebar, p. 9]. Visiting with the troops in the field is what I enjoy the most. And I encourage people to contact me. It not only helps me keep in touch, but keeps me grounded and focused on what I need to be focused on. In my job, I don't own a program—my program is the enlisted force."

Our trip to Andrews began early, but not too early; most members of the 316th had the chance to settle into their workday before we arrived. Along for the ride was TSgt Billy Tramel, one of the two CEs named a 2006 Outstanding Airman of the Year. In town from Wright-Patterson AFB, Ohio, for the award ceremonies, TSgt Tramel was taking the opportunity to catch up with friends in the 316th CES.

"It's been a busy year and the only thing that's certain is it won't be slowing down any time soon," said Chief Quattrone.

On the way over, Chief Quattrone spoke about the things that take precedence in his role as Chief of Enlisted Matters. "Not coincidentally, my priorities are the same as General Eulberg's—Readiness, Transformation, and Combat Support," he said. "But my focus is specifically on the organization, training, and utilization of the enlisted force and wage-grade employees. For me, it always gets down to the troops—we want to make sure that our people are trained, prepared, and well taken care of.

"Right now, one of our biggest challenges is transformation coupled with a reduction of forces; it will take center stage for all of us," said CMSgt Quattrone. "We can't say change is coming—the reality is that it's here. But out of all the communities, I really think civil engineers have stepped forward and will be the best prepared for it. Many of the questions I'll get today will be connected to the changes; they're what a lot of our folks are thinking about. And no matter what base I'm at, some of the questions I'll get will be the same. As a matter of fact, I'll give you five questions that I can guarantee we'll hear today." [See "Ask the Chief" on p. 11.]

CMSgt James Kindler, Chief Enlisted Manager for the 316th CES, met us when we arrived at the squadron. During this visit, he was also our manager, making sure our "entourage" moved along on schedule and got to all the right people and places. We began our tour in the main building and as we wended our way through, CMSgt Quattrone stopped to meet all the people working in the different offices, sometimes asking questions, but more often answering them.

Next we visited some of the folks who work outside of the main building. Our first stop was the explosive ordnance disposal flight, where we got to see the plans for their new building and the new B-SERV (base

CMSgt Wayne Quattrone—pictured above with Col Timothy Byers, Air Combat Command's Director of Installations and Mission Support—recently toured Southwest Asia as part of the team traveling with Maj Gen Eulberg.

The chief had this to say about his trip to the AOR:

"I felt fortunate to be part of the general's team. We visited every main operating location in the AOR with a few specific goals, including these: present key transformation concepts; ensure that combat support troops are organized, trained, and equipped to accomplish the mission; ensure that personnel benefit from lessons learned at home station and on deployment; evaluate 'in-lieu-of' taskings; provide a total-force picture with the Air Force Reserve component; and gain firsthand knowledge about how the Air Staff can better support the warfighter.

"Most importantly, we wanted to hear the troops' concerns and give them our personal thanks for what they do. The roles and missions our troops are performing are beyond anything we would have expected prior to 9/11. In addition to our Air Force taskings, about half of our deployed engineers are working with the Army, Navy, and Marines as part of specialized teams.

"Although our trip was very short, it didn't take long to realize that our troops are motivated and performing way beyond anyone's expectations. They made me proud to be part of the civil engineer family."

support emergency response vehicle). The discussions centered on their career field as a whole, about critical manning at different grades and skill levels, their deployment rotations, and their training and equipment.

Our second stop was the Liquid Fuels Maintenance shop, where CMSgt Quattrone spoke to the military CEs, as well as to the civilians and contractors, most of whom are prior military. Here we got our first "top five" question, about merging career fields. CMSgt Quattrone answered the question seriously, as if he'd been asked it for the first time. As he explained later, "I may have heard the question before, but it's the first time they've asked it, and I respect that. So it's important that I give them—and the answer—the right consideration."

We then headed back to the main building so that CMSgt Quattrone could meet and talk to the 316th CES commander, Lt Col Brian Duffy, and answer any questions he might have about enlisted force initiatives. After that, it was time for lunch. CMSgt Kindler had it timed just right, so that most of his folks would be back at work when we resumed the tour. On the way to lunch, the discussion was about training, so far the subject of several questions. As the day went on, training came up quite a few times more.

"We realize it's a challenge sometimes to get everyone meeting all the training requirements and making sure everyone has the training they need, when they need it," said

CMSgt Quattrone. "For the Guard and Reserve, with their 39-day time constraints, it can be even harder. AFCESA, AETC, and the schoolhouses have done a great job modernizing our formal training over the past two years. However, we now face severe funding reductions that will limit some 7-level schools and advanced training classes, forcing bases to train more specialty-specific skills at home station. It's become a challenge for our senior officers and enlisted leaders.

"With combat skills training, we've come a long way, but we still have a way to go," continued CMSgt Quattrone. "What I'd like to see in the future is more home station training and shorter training en route. AFCESA has developed 19 lesson plans to ensure that combat skills are taught at home station, but now we need to take them from the chalkboard to the training sites—no small feat for the commanders and chiefs who have so many competing priorities."

Lunch over, we continued our tour. In order, we went to the

Top right: TSgt Mark Porter, NCOIC of EOD Resources for the 316th CES, and CMSgt Quattrone discuss some "old" EOD equipment before looking over the newer, lighter alternative. Below left: CMSgt Quattrone presented SrA Andrews James, Fire Protection Apprentice, with one of his Chief's coins. Below right: MSgt Kirk Kessler, Engineering Superintendent, and CMSgt Quattrone talk about MSgt Kessler's recent deployment to the AOR. (photos by the author)

Ask the Chief

CMSgt Quattrone's guaranteed to get these five questions every time he visits a unit:

1. What's the latest on Career Job Reservations and Noncommissioned Officer Retraining?
2. Will all of CE become "Superbase" or RED HORSE Squadrons?
3. Will certain career fields merge?
4. Why are we downsizing in a time of war?
5. Will we go to a six-month rotation for all AEF taskings, and will we see more 365-day tours?

CMSgt Quattrone invites enlisted members to personally ask him one of the questions above or any others you may have by logging onto his Community of Practice at https://wwwd.my.af.mil/afknprod/ASPs/CoP/OpenCoP.asp?Filter=OO-EN-AF-08 "A7CM Civil Engineer Enlisted Matters".

Vertical Shop, the Electric Shop, the Readiness Flight, the Fire Department, the Horizontal Shop, and the HVAC Shop. CMSgt Quattrone was right: he got all the questions on his top five list, almost all more than once, and he got many others, as well. Several people were recognized with the Chief's coins. More than a couple of people said they heard that CMSgt Quattrone was a carpenter and he corrected the verb. "I am a carpenter—that's what I was first trained as when I came in the Air Force in 1979," he said. "At my first base carpentry and masonry were combined—even before the Air Force merged them—so I trained in both, then spent a few years as a superintendent; but I still consider myself a carpenter." Everyone seemed to understand the answer and the feeling behind it.

Finally, the visit was done. We picked up TSgt Tramel, said goodbye and thanks to CMSgt Kindler, and left Andrews and the members of the 316th CES. We recapped the day. "This was a great visit," said CMSgt Quattrone. "I got to talk to a lot of CEs throughout the squadron and hopefully answer all their questions. The best thing is that I got a lot of ideas, and I got recharged—about our career field and our people.

"My job comes with a lot of challenges, but it has a lot of rewards," said CMSgt Quattrone. "I work with a great team on the Air Staff. I've been very fortunate to work first with General Fox and now with General Eulberg, both very committed to ensuring that our enlisted force has the war-time skills they need, are prepared for their home station jobs, and are taken care of overall. But what I look forward to the most is visiting the troops in the field. I'm always impressed by their professionalism and dedication. They get the toughest jobs done with enthusiasm and ingenuity…it motivates me to work hard on their behalf."

I ended my day recuperating at the airport; the chief hit the road yet again, this time in his running shoes to train for a marathon.

No More Red Hats in Europe

Capt Jack A. Blalock
HQ USAFE/A7CPDO

I must begin this article with an apology to all my fellow civil engineer company grade officers out there. Up until last month, there was one position for a CE CGO to have the opportunity to be a commander on G-series orders in charge of a RED HORSE Flight, not only located in U.S. Air Forces in Europe, but in beautiful Tuscany, Italy. The reason the position no longer exists is quite an amusing story.

It begins when I arrived and took command in April 2005. I quickly learned that the 712th RHF mission of providing vehicles and equipment to deploying teams was suffering not only because of vehicle replacements but, most importantly, from the lack of a war or imminent threat within Europe. This small unit of 40 people was born out of the Cold War, when the 819th RHS was transferred to RAF Wethersfield, U.K., in 1979. They decided to pre-position two sets of equipment around USAFE, one at Spangdahlem and one at Aviano. Both units were available to quickly provide heavy repair vehicles and tools in case the Soviet Union decided to take out any of our larger assets. As the Cold War drew down in 1990, the 819th inactivated, but the two units were kept in place for future use. Without an immediate threat in Europe, the assets did not need to be separated, so in 1994, they were joined together and brought to Camp Darby, Italy, under Aviano's 616th Regional Support Group. Since then, the name has been changed only twice: in 1996 to the 31st RHF under Aviano's 31st FW, and in 2004 to the 712th RHF, when added to the 38th Combat Support Wing (combined all geographically separated units in Europe under one wing).

As the new commander of the 712th RHF, I began wondering about possible replacements for our 1980s and 1990s era vehicles. The answer I kept getting was that the war in Iraq was limiting vehicle purchases. My next thought was that with the stability in Europe, why should we be keeping old rusting vehicles without proper storage, thousands of miles away from the action? I couldn't really get a good answer to that one, so I took that question with me to my introductory commander's conference at USAFE in June 2005.

Here's where I learned a valuable lesson that will stay with me a long time. We listened to a great leadership briefing from USAFE's vice commander, and were allowed to ask questions at the end. Many people were asking about specific units and bases, and their futures, so I thought why not throw out my question about the 712th RHF's future. He didn't have an answer and told me he would get back to me. That's when a two-line e-mail went out to the USAFE Mission Support Group Director, then rolled down through the various levels until it came to the CGO staff who spent the rest of Monday evening generating a response, all angry at some dumb captain for asking a three-star a specific question. Two weeks later the A7 showed up at our door, took a look around, went straight back to the USAFE commander, and said it's time to close the 712th RHF. The rest, of course, is history.

During the close-down process, a few of the previous commanders and flight members spoke about this small unit. It was through them that I learned of how much pride and dedication was put into this small family and how their tours here were some of the most memorable times of their Air Force careers.

From Lt Col Navnit Singh, former 616th RHF commander and now the base civil engineer at Ellsworth AFB, S.D.: "We had a hell of a fun time relocating all those assets from the U.K. to Spang and Aviano. I was the CC of the Spang flight with 27 personnel; the Aviano flight had 36 persons. When the prime real property the flights were on was given to units relocating as part of the massive USAFE drawdown and reorganization in the early 90s, we looked at Moron AB in Spain and Vicenza and Camp Darby in Italy. We chose Darby and started the beddown in the summer of 1994. I was the new CC; we

On October 23, 2006, SMSgt Lorenzo Luechtefeld, Capt Jack Blalock, and TSgt Herman Quintero retired the 712th RHF guidon.
(U.S. Air Force photo)

tried to maintain the total 63 positions, but USAFE said 'here are your 42 positions.'

"We thought we would have a slow, easy time because Camp Darby was quite the Sleepy Hollow, but the genocide in Rwanda thrust us into EUCOM's radar, and then the Balkan War's appetite for equipment reached us. We rapidly found ourselves bedding down and simultaneously supporting multiple contingencies and Joint-Chiefs-of-Staff exercises. We became the most experienced RH unit with regard to loading every type of transportation available, every configuration of sealift, rail…we were the first RH unit to load C-17s at Pisa airport. There were exciting times and fond memories for all of us fortunate to have served in one of the most effective enabling units in USAFE."

From Lt Col David Eaton, BCE at Eglin AFB, Fla., who succeeded Lt Col Singh as 31st RHF commander: "As I got responses from all of my old 31st RHF troops about the inactivation, almost to a man they came back saying 'best assignment ever.' I think I speak for all of us when I say that the inactivation of Europe's only RH unit comes with great sorrow and with great pride as we remember our time there. We worked hard, we played hard, and if we weren't HORSEmen when we got there, we were HORSEmen by the time we left.

"One of the greatest revelations I had while I was the commander there was just what it means to be a HORSEman. So here's the deal: just because you're wearing a cool red hat, it doesn't mean you're a HORSEman. Being a HORSEman means that you are dedicated to your mission and willing to do whatever it takes to get it done. It means that when the rules get in your way, you find a way around them and take a few risks and scrounge for what you need to succeed in your task. It means loyalty to the folks in your shop and your squadron, and that you'll be there if they need you. It means loyalty to your country and your Air Force, and that you'll answer the call to go wherever and whenever they need you. It's a spirit, selflessness, and dedication that can be cultivated, but not learned. Doesn't matter if you have 40 red hats or 400, a HORSEman is a HORSEman, period."

I agree completely with these two previous commanders. The opportunity to lead this fine unit was everything—and more—that I expected. Though this legacy has ended in Europe, it may be carried on through a future unit doing the same mission closer to the current war in the Middle East. Time will tell. But for now, the 712th RHF is inactivated and leaves with a high head and a proud heritage, reflecting great credit on Air Force civil engineers and the RED HORSE. Ciao, Italy!

Capt Blalock was the final commander of the 712th RHF; he is now Chief, Northern Region Programs, HQ USAFE/A7CPDO.

S-Teams "BEEF Up" the Force

Maj Anne M. Haverhals
240th CEF/CEOV

S-Teams (Prime BEEF Staff Augmentation Teams) are an unknown commodity to a lot of people in the Air Force—including their fellow civil engineers. But those who have worked with them or know about them have nothing but tremendous respect for the talent and capability of these teams.

S-Teams are senior-level engineering flights with the primary mission of augmenting command staffs during contingency operations such as federal emergencies, humanitarian relief, and war. Because of ongoing operations and high demand for S-Teams, The Air Force Civil Engineer authorized the creation of several new S-Teams and increased manning at some existing ones.

	Unit (# of S-Teams)	Unit Location	Commands Supported	Contact Number
Reserve	628 CEF (2)	Dobbins ARB, Ga.	PACAF	770-919-3309
	810 CEF (1)	Carswell ARS, Texas	ACC	817-782-5156/7
	904 CEF (1)	March ARB, Calif.	PACAF	951-655-6607/8
Guard	235 CEF (3)	Martin State Airport, Md.	USAFE, EUCOM, JCS	410-918-6567
	231 CEF (3)	Lambert-St. Louis Airport, Mo.	PACAF, AMC	314-526-6410
	240 CEF (3)	Buckley AFB, Colo.	PACAF	720-847-6395

There are currently only 13 S-Teams in the Air Force; nine in the Air National Guard and four in the Air Force Reserve (see table).

"We are always on the lookout for great engineering talent," said Col Mike Flood, commander of the 240th Civil Engineer Flight. "The demand for our services always exceeds our available resources."

A typical S-Team has 10 engineering officers, one senior NCO engineering superintendent, one civil engineer manager, one fire protection manager, and two senior NCO fire management personnel. As components of the Air National Guard and Reserve, S-Teams benefit from their members' varied backgrounds and collective experiences: all military services are represented, as are the fields of civil, architectural, electrical, mechanical, structural, and environmental engineering.

When augmenting a command staff, S-Team members track, procure, plan, and coordinate the utilization of theater or area-of-responsibility engineering assets; track repairs to damaged airfields and facilities; and brief and coordinate with other military functional areas. S-Teams are particularly valuable during exercises; corporate knowledge gained from many years of participation in similar exercises is shared with their active duty partners.

Members also often deploy as individuals or as small "consultant" teams to assist with various engineering and environmental projects. S-Teams can produce a professional product with much less expense than private contractors. Projects have included airfield surveys and pavement evaluations, facility programming, preliminary site plans and cost estimates, real estate inventories, updates to natural and cultural resource management action plans, environmental and OSHA assistance, and spill plan updates.

Since 9/11, S-Teams have been widely used at their home bases, their major commands, the Pentagon, and in Southwest Asia. Although some members did augment command staffs, the majority found their civilian job skills extensively used to support other military engineering teams—designing for Army combat engineers, overseeing bases' Bureaus of Public Works, creating master plans, managing projects, and inspecting facilities.

From August 2004 to May 2005, members of the 231st CEF deployed to Afghanistan. Team members were attached to an Army group and provided engineering design and construction management for bases. Projects included electrical systems, water distribution and wastewater collection, a helicopter parking/refueling apron, and a C-130–capable airfield. Record snowfall in 2005 caused damage to many facilities; the runoff from the thaw damaged or destroyed roadways and bridges. S-Team members conducted prompt, accurate evaluations and repair/replacement designs that were critical in sustaining operations.

In 2005, several S-Team members from the 810th CEF deployed to Iraq, joining engineers from other units to form the 732nd ECES, Det. 14. The detachment was responsible for base master planning; utility renovation and expansion; environmental remediation; base and airfield surveys; war damage facilities inspection; and repair programming. They were the lead design team and project managers for the new Army Corps Distribution Center.

The 240th CEF received a crash course in Army culture as 19 S-Team members performed engineering functions in Iraq for the U.S. Army; three team members earned the Bronze Star for their efforts. Tasks varied from base planning, public works management, engineering design, and facility inspections to decommissioning bases. One member of the 240th CEF, Maj Phil Landeros, found his civilian structural engineering expertise invaluable as he worked to keep critical roads open and joined Active Duty engineering assistants from Eielson AFB, Alaska, to aid the 372nd Combat Engineering Group with their bridging mission.

Ten engineers from the 904th CEF S-Team and eight EAs from the 452nd CES and 624th CES combined to support Army engineering facility requirements in Southwest Asia. The team manned three 6-month rotations in support of Operations IRAQI FREEDOM and ENDURING FREEDOM, working on several high-priority engineering projects: alternate supply convoy route siting, design, and specifications; military retention camp inspection and review; and design and construction of a border crossing facility. They proved to be a valued part of a joint-service team and continued the tradition of excellence begun by their predecessors.

Maj Haverhals is a civil engineering officer with the 240th CEF, Buckley AFB, Colo.

Members of the 240th CEF joined Active Duty engineering assistants to help the U.S. Army build bridges in Iraq. These two float bridges give civilians and coalition forces an important river crossing. (photo by Maj Phil Landeros)

A Leaner Approach to ESOHCAMP

Ms. Melanie DiAntonio
HQ ACC/A7V
Lt Col Darren Gibbs
HQ ACC/A7I

Civil engineers are always looking for ways to improve efficiency and reduce waste in our daily operations. AFSO 21—Air Force Smart Operations for the 21st Century—gives us a roadmap for process improvements and challenges us to ask, "What have I improved today?"

The Environmental Safety and Occupational Health Compliance Assessment and Management Program has eliminated much inefficiency and improved ACC's operations and compliance record. As a result, it has been recognized as one of the best programs in the Department of Defense. In an effort to achieve even greater improvements, the time has come to take our assessments to the next step and get "lean."

Using the Lean process, we've discovered that 70% of ESOHCAMP findings continue to be the same for each assessment. A statistical analysis of the findings revealed common weaknesses in procedure implementation and management oversight. Enforcement actions were ineffective for similar reasons. Thus, installations spend enormous amounts of time preparing for ESOHCAMPs using flawed processes, which results in compliance stagnation rather than improvement.

As part of the process, we held an ESOHCAMP rapid improvement event, or RIE, with a team whose members represented a wide variety of backgrounds, from base-level flight chiefs to a former wing commander and included cross-functional expertise in, environmental safety and occupational health. The team identified the ESOHCAMP customer as the wing commander. With that in mind throughout, the team's objective was to promote robust ESOH programs and sustained compliance with a smaller footprint and less disruption to mission operations.

Going into the RIE, we knew some things for certain. Base preparation for prior notice assessments does not lead to sustained compliance. Our focus should be on improving the processes and not the number of findings. Our large teams of 25 or more assessors disrupt daily base operations. Clearly there was some room for improvement.

The improvement opportunities we identified require a paradigm shift. We need to train major command and base personnel to focus on process improvements to eliminate repeat findings. Because the goal is to achieve sustained compliance, the RIE team agreed that just like regulators, ESOHCAMP assessors shouldn't provide advanced warning of inspections. ESOHCAMP teams should be smaller for less impact on base operations (in ACC we'll focus solely on regulatory as well as work health and safety compliance). In the past, ESOHCAMP assessors have left corrective action plans with the base. Now, team members will work closely with base personnel to determine root causes for findings before determining the corrective action plan. This root-cause analysis will be applied to the entire base and not just to the one shop that incurred the finding.

The bottom line is that through Lean thinking, our RIE team projects a 2,460 man-hour savings and an approximately $135,000 cost avoidance per ESOHCAMP assessment. ACC ESOHCAMP will become an efficient tool for risk reduction rather than risk awareness. This will lead to sustained compliance and increase our mission capabilities. But the important thing is that we're not done yet. We will continue to improve ESOHCAMP by constantly striving to eliminate waste and enable the mission.

Ms. DiAntonio is the Program Analyst for Environmental Quality and Lt Col Gibbs is the chief of the Integrated Mission Support Branch for the Installations and Mission Support Directorate, HQ ACC, Langley AFB, Va.

What Does "Lean" Mean?

Although the concept behind it isn't new, the Lean process used today first received attention from the automotive industry 20 years ago. Today's Lean process is actually a continuation of a stream of manufacturing developments that began in the United States with Henry Ford, were combined with advances made by the German aircraft industry during World War II and perfected in post-war Japan by Toyota, and are now embraced by hundreds of organizations, including the U.S. Air Force.

Lean thinking consists of five principles:

- Defining value from the perspective of the final customer
- Mapping the value stream—looking at everything that goes into creating and delivering value to the customer
- Making the value stream flow continuously by removing barriers
- Responding to customers from an "on demand" basis only
- Striving for perfection—constantly re-examining the process to make it better

Lean is a continuous evaluation of program processes that looks at what one's doing now, identifies non–value-added steps in the workflow, and improves that workflow by eliminating waste.

Lean isn't an exercise to reduce staff, an indication of a poor program, or a waste of time. LEAN thinking makes us ask how we can accomplish the mission faster, better, and cheaper.

Tools to implement Lean changes span from the low end of quickly executed "Just-Do-It" events to more detailed, time-intensive projects. One of the most important implementation tools is a Rapid Improvement Event—an in-between level of effort that uses a small team to examine processes for value and waste. Used as the building blocks of the Lean process, RIEs incorporate the philosophy that incremental changes routinely applied and sustained over long periods of time will result in significant improvements.

Staff members at HQ ACC used the Lean process to streamline environmental, safety, and occupational health compliance assessments. (U.S. Air Force photo)

3D Visualization Brings Fl

Mr. Mark O. Hunt
HQ ACC/A7DE

Through the use of computer modeling, rendering, and animation, 3D Visualization brings conventional two-dimensional floor plans to life, providing customers with a virtual tour of their proposed project. HQ ACC's Installation and Mission Support Directorate has established 3D Visualization as a "Leading Practice" in their military construction program because of its important role in a project's developmental process.

Once the building floor plans and elevations are sufficiently complete during the Customer Concept Document process, 3D Visualizations are developed by designers using a standardized statement of work and following examples and video direction provided on ACC's 3D Visualization CD-ROM. It costs approximately $10K to create a 3D Visualization, which is provided in the final Customer Concept Document submittal.

3D Visualization begins with an aerial view of the base and zooms in for a closer view of the site plan. It then focuses on any existing facilities to be demolished before construction, and transitions to the new building(s) to be constructed. Next, two animations take the customer around the new building: first on a bird's-eye view "fly-by" and then on a pedestrian-view "walkabout." These two animated views give customers and designers realistic perspectives of a new building on its site, with adjacent facilities. They also allow review of a building's architectural compatibility and adherence to base and command design standards. A third animation takes the customer on a "walk-through" tour of the building, entering by the front door and traveling throughout key locations. This view shows such things as people, workstations, furnishings, fixtures, finishes, lighting, and audiovisual equipment.

3D Visualization has several benefits. Foremost is that it gives customers who are not engineers or architects the opportunity to find problems early in the process. Interpreting two-dimensional design drawings can be difficult for some customers; they often find operational or integration problems after the construction begins, when changes cost more and take more time to correct. With 3D Visualization, customers can "try on" their new building during the concept development stage, before technical design actually begins. 3D Visualizations can also be used as media tools, to present projects to installation commanders and to gain support for congressional insert projects. Cost estimating firms can use 3D Visualizations to improve accuracy of project estimates, and construction contractors can use them during pre-bid conferences to improve bid proposals.

Additional information on 3D Visualization is available at https://a7.acc.af.mil/cec/customer.asp, or from Mr. Randy Jenkins at HQ ACC/A7DE, DSN 574-6578.

Mr. Hunt is the Chief of Design and Construction - East Branch, HQ ACC, Langley AFB, VA. He is a civil engineer and LEED Accredited Professional.

A "fly-by" shows the new building and its surroundings for site considerations and architectural compatibility. "Walk-through" animations in the entry lobby and operations room show spatial relationships, finishes, and furnishings. (Renderings courtesy Bullock Tice Associates, Inc.)

oor Plans to Life

Just as fighter pilots use flight simulators to help visualize their aircraft in aerial combat, Air Combat Command design project managers use 3D Visualization to help customers "see" the layout of their planned buildings.

Hill AFB CEs Remembered in Memorial Services

At home and in the theater, family, friends, and colleagues gathered to honor three civil engineers who lost their lives Jan. 7 while performing duties in Iraq.

TSgt Timothy R. Weiner, SrA Daniel B. Miller, Jr., and SrA Elizabeth A. Loncki, all members of the 775th Civil Engineer Squadron's Explosive Ordnance Disposal Flight at Hill AFB, Utah, were deployed to the 447th Expeditionary Civil Engineer Squadron. As members of "Team Lima," they were investigating a vehicle-borne improvised explosive device when the device detonated, killing them and injuring another 447th ECES EOD Airman, MSgt William A. Ewing, deployed from the 329th Armament Systems Group, Indian Head City, Md.

On Jan. 10, more than 480 Airmen and Soldiers gathered at the 447th AEW headquarters building, Sather AB, Iraq, to pay their respects. "The actions of Team Lima saved many lives," said Col Gregory Marston, 447th AEG commander. "During their time in Iraq, Team Lima successfully executed 194 missions on the outskirts of Baghdad, resulting in the safe disarming of 129 IEDs. Each time they left their forward operating bases, they faced many dangers yet did not shrink from their task."

Col Marston said pictures of the three EOD Airmen would be placed in the new dining facility near the picture of the EOD technician that gives the facility its name, TSgt Walter M. Moss, who was killed in action in Iraq last year (see sidebar opposite).

At Hill AFB on Jan. 12, hundreds of mourners packed an aircraft hangar to pay tribute to the memory of the three fallen Airmen. The tragedy marks the first casualties from Hill since Operations Enduring Freedom and Iraqi Freedom began.

Far right, top to bottom: TSgt Timothy R. Weiner, SrA Elizabeth Loncki, SrA Daniel B. Miller, Jr. (U.S. Air Force photos) *Near right: Brig Gen Robin Rand, the 332nd Air Expeditionary Wing commander, places one of his coins on the memorial display for TSgt Timothy Weiner during a memorial service at Sather Air Base, Iraq, on Jan. 10.* (photo by SSgt Scott McNabb)

Air Force DFAC Honors Hero

At the opening ceremony Dec. 25 for the first Air Force dining facility in Baghdad, Col Gregory Marston (left) and Lt Gen Gary North take down camouflage netting to reveal the carved sign and memorial to TSgt Walter Moss. The new DFAC at Sather AB is named in honor of TSgt Moss, an EOD team leader deployed to the base, who led his team to complete 119 missions and clear 40 improvised explosive devices before he was killed in action in March 2006. "This facility is about this man, our base and the Air Force mission you do here," said Col Marston, the 447th AEW Commander. "He epitomized all that is good and right in our U.S. military. He was a volunteer for one of the most dangerous career fields in the Air Force. He was a true patriot and inspiration to those who knew him." *Text and photo by SSgt Scott McNabb, 447th AEW/PA*

"Tim, Liz, and Dan were among an elite group of nearly 1,200 active duty EOD Airmen that the rest of the world looks to," said Lt Col Craig Biondo, commander of the 775th CES. The service was capped with three explosions—the EOD community's equivalent of a 21-gun salute.

A member of the Air Force for 16 years, TSgt Weiner was on his second deployment to Iraq. He leaves behind his wife, Debbie, and teenage son, Jonathon. He was a native of Tamarac, Fla., and one of four brothers who joined the military. "It's just the direction we all headed," said his brother, Mr. Eric Weiner. "Timmy died, honestly, doing what he loved and something he believed in, truly." TSgt Weiner was buried with military honors at Fort Logan National Cemetery in Denver, Colo.

SrA Loncki, 24, entered the Air Force in 2003, and had been stationed at Hill AFB since 2004. She was born and raised in New Castle, Del., where her funeral was attended by people who had known her since childhood, as well as local, state, and federal dignitaries and her military comrades. "She said that … what she was doing and the time away from her family would all be worth it if she could help someone and come back here," said her father, Mr. Stephen Loncki. She was buried with military honors in the Delaware State Veterans Cemetery.

SrA Miller, 24, joined the Air Force in 2004. He was from Galesburg, Ill., the oldest of five siblings and several stepsiblings. Most of Galesburg and its surrounding small towns turned out to remember and honor their local hero. "He was a role model for responsibility and for getting the job done. He never backed away from the challenge, never backed away from work," said Mr. Dale Grawe, SrA Miller's former football coach at ROWVA High School in Oneida, Ill. SrA Miller was buried in Wataga, Ill., with military honors by the Scott AFB Honor Guard.

The Airmen's names will also be added to the Air Force tablet at the EOD Memorial, located at Eglin AFB, Fla. The tablet is inscribed with the names of all those who have died on active duty as a result of an EOD mission since World War II. The Airmen were awarded several posthumous medals and awards, including the Bronze Star and Purple Heart.

Compiled from stories by SSgt Scott McNabb, 447th AEG/PA; Mr. Mitch Shaw, 75th ABW/PA; Mr. Matthew D. LaPlante, The Salt Lake Tribune*; Ms. Jane Carlson and Ms. Rebecca O'Halloran,* Galesburg Register-Mail*; Mr. Stephen Speckman,* Deseret Morning News*; the* Hilltop Times*, Hill AFB; and personal accounts of EOD colleagues attending the services.*

"Dirt Boyz" Proudly Do the Dirty Jobs

MSgt Mitch Gettle
376th AEW/PA

The 376th Expeditionary Civil Engineer Squadron's heavy equipment shop revels in performing the dirtiest of jobs.

"The one thing about our job is the people love doing what they do," said MSgt Stevie Wells, 376th ECES heavy equipment shop superintendent.

Members of the 376th ECES "Dirt Boyz," SSgt Jeffrey Trombley (left) and TSgt Bryce VanOverbeke screed freshly placed concrete on a sidewalk, while SSgt Adam Ruter (center) rakes the concrete level. SSgts Trombley and Ruter are deployed from Grand Forks AFB, N.D., and TSgt VanOverbeke is deployed from Elmendorf AFB, Alaska. (photo by the author)

The heavy equipment operators, affectionately known as the "Dirt Boyz," perform many tasks on the base.

"We are responsible for all roads, sidewalks, storm sewer systems, and airfield pavement," said MSgt Wells. "We run the sweepers, cranes, and backhoes to support other construction projects and CE shops. We also do all the snow removal on Air Force properties here."

Recently, the Dirt Boyz have been the ones wearing concrete residue on their uniforms from forming and pouring sidewalks throughout Manas AB, Kyrgyzstan.

"We have a sidewalk plan of 3,000´ for the base," said SSgt Troy Pietz, 376th ECES heavy equipment operator deployed from Grand Forks AFB, N.D. "Right now, this is our priority—to complete these sidewalks."

The plan for 3,000´ is a straight-line distance but, when pouring the concrete, it measures a whole lot more. "We've formed and poured enough concrete in the last 30 days that, when measured 4´ wide by 4" thick, it equals 1.6 miles," said MSgt Wells, also deployed from Grand Forks. "Our goal is to do as much as we can before weather turns bad."

This rotation's crew has completed more than 10 times the distance of the previous rotation. MSgt Wells credits it to the crew's familiarity with one another; most came from the same base.

For one of the Dirt Boyz who is not from Grand Forks, this deployment is special. "This is my first deployment, and I'm loving it," said Amn Christopher Petrosky, deployed from Charleston AFB, S.C. "There is a higher work tempo here, and a little more sense of accomplishment because of the larger-scale projects we get to do."

As winter draws near, having a solid surface to walk on and to be able to clear is most important. "We're...in charge of snow removal, so having the sidewalks will make our job easier," said SSgt Pietz.

The Dirt Boyz recently completed sidewalks around some of the dormitories and the new fitness center. But there's still more work to be done. "We're connecting the sidewalks all the way to the new ETDC [Expeditionary Theater Distribution Center] location (the old fitness center) and post office," said MSgt Wells. "We will connect Temporary Cantonment Area Annex to Main TCA and run a full sidewalk from Dormitory 300 to the chapel before winter sets in."

The Dirt Boyz' progress during this rotation significantly improved the infrastructure of the 376th AEW.

Ride the RED HORSE

Maj Richard Sater
332nd AEW/PA

Don't let the color fool you. This is no merry-go-round.

You want a road built? New living quarters from the ground up, or an old building demolished? You want it done quickly? RED HORSE is your animal, tackling heavy construction right here, right now.

The 557th Expeditionary RED HORSE Squadron consists of approximately 400 Airmen filling billets in lieu of Army engineers, working at a dozen locations throughout Iraq. It's big work. Hard work. On any day here, you'll find Airmen building a SEA (Southeast Asia) hut, erecting a clamshell tent, patching spalls on an aircraft parking ramp, paving a new stretch of road, conducting a combat logistics patrol outside the perimeter, fixing an engine on a Humvee, and more.

The work is mostly outdoors under the blue sky and hot sun. The tools are mostly big and noisy—jackhammers, bulldozers, nail guns, power saws, and .50-caliber rifles. Clearly, part of the satisfaction—and part of the fun—of being a RED HORSE CE is the variety of tasks assigned and the commitment required to complete them. It's hard not to be motivated when the work satisfies the strong urges to raise a ruckus and get dirty—though the real payoff is pride and sense of accomplishment.

The HORSE won't gallop without teamwork. Every project is a group effort—3 or 4 or 20 Airmen with a common aim. Bringing people together from different units and expecting them to become a team could present a huge obstacle.

"We had 30 to 40 days together [at combat skills and task validation training] before we got here," said Lt Col Pete Garner, officer-in-charge of a detachment of the 557th ERHS, deployed from the Virginia Air National Guard's 203rd RHF, Virginia Beach. "It's made things easier. We knew our capabilities, and we jumped right into work."

"We work in conjunction with the Army engineers," Lt Col Garner said. A facility-engineering team "puts together a plan and comes to us for design and construction."

More than 35 active duty and ANG CE units contributed Airmen to the 557th. Half of the Airmen come from sister ANG units, the 202nd RHS from Camp Blanding, Fla., and the 203rd. Command and control of the 557th is at Balad AB under Col Jack Paschal, who commands the 202nd back in Florida. The rest of the manpower comes from active duty and ANG Prime BEEF units around the globe.

No one wears the home unit patch, however. "We're all the same team," Col Paschal said. "Unit designations don't mean anything over here—you're part of the HORSE."

SSgt Don Meyer works "outside the wire" as part of a combat logistical patrol team. SSgt Meyer is deployed to the 557th ERHS from the 202nd RHS, Camp Blanding, Fla. (photo by the author)

The new rotation of the 557th ERHS has only been on the ground for a week, and it's already charging ahead full-speed with the Army's project list. "We're here to improve the quality of life for the folks who have to go outside the wire—doing their part to stabilize the country," Lt Col Garner said.

Boring Is Good

Dr. Daryl Hammond, P.E.
HQ AFCESA/CESM

They're construction site icons, those big yellow backhoes. We don't give them much thought as they inch along, tediously scooping and digging so that utility lines can be buried. The interim result is piles of unsightly dirt and when it rains, it gets messy: mud, lots of it. But there is an alternative to the "big yeller" backhoe tearing up streets and landscape, and generally making a mess. It's called "directional boring," a trenchless technology buzzword. This precision drilling technique allows conduit and pipe to be installed in a prescribed bore path that may be many feet below the surface.

Directional boring methods are often used to install underground pipeline, utility, fuel hydrant, or communication lines under runways, taxiways, aprons, roadways, waterways, congested areas, and environmentally sensitive areas where conventional jackhammer and backhoe methods are impractical or expensive. By using a steerable drill system to create a pathway for conduit, the equipment operator can control the depth and direction of the boring with superb accuracy.

The process of directional boring is relatively simple. A drilling head is attached to a length of sectional drill pipe and the directional boring machine pushes the assembly through the ground. Additional sections of drill pipe are added as necessary. To improve drilling, a special drilling fluid—non-toxic and environmentally friendly—is injected into the boring path.

Once the drill bit exits the ground at the desired point, it's replaced with a special attachment called a reamer. Several back-and-forth passes of the reamer bit may be needed to enlarge the bored hole to the chosen pipe or conduit size. The pipe or conduit is then pulled through the enlarged bore and the ground is excavated around the bore entry to connect to other piping or ground-mounted equipment.

What's Permitted on USAF Installations?

Engineering Technical Letter (ETL) 04-4 (Change 1): *Trenchless Technology (TT) for Crossing Air Force Pavements,* provides general information and guidance on the use of directional boring in constructing, reconstructing, rehabilitating, renovating, cleaning, inspecting, locating, and detecting anomalies around underground pipelines, utilities, fuel hydrant lines, or communication lines crossing under Air Force pavements, including runways, taxiways, aprons, overruns, and roadways.

However, this ETL is not applicable to either high-voltage or low-voltage electrical distribution systems installed, repaired, or modified on Air Force installations. In fact, there is no Air Force guidance permitting directional boring use for these types of systems. AFMAN 32-1080, *Electrical Power Supply and Distribution*, requires all underground distribution systems to be installed in concrete-encased conduit, which is accomplished using backhoe excavation methods. This installation method protects the electrical wires from damage.

Changes On The Way!

HQ AFCESA is well aware of the advantages associated with directional boring technology and has taken steps to define stringent criteria when used for electrical power distribution. ETL 07-1, *Design Criteria for Underground Electrical Distribution Systems Using Directional Boring (DB) Installation Methods*, published in February 2007, provides detailed application and installation criteria for using this technology. BCEs must keep in mind, however, directional boring methods are not to be chosen as an installation method in lieu of concrete encasement based solely on cost. Concrete encasement always provides the best protection for conduit and conductors. Once ETL 07-01 is published, directional boring will be authorized only for crossing under these areas:

- Roads
- Parking lots
- Airfield aprons, taxiways, or runways
- Bodies of water
- Environmentally sensitive areas with appropriate federal, state, and local government approval
- Historical preservation areas with appropriate federal, state, and local government approval

Is DB the Best Choice?

DB may not always be the best choice even when authorized, so designers still need to consider system characteristics, constructability and site conditions when deciding whether to use this method. Therefore, each opportunity to use this trenchless technology must be evaluated on a case-by-case basis. The presence of qualified, experienced, certified contractors and equipment operators is essential to the success of a DB project, as is the availability of the proper equipment and materials for the job and site conditions. Doing it the right way is a must!

Additional information on application of this technology can be obtained from HQ AFCESA/CESM.

Dr. Hammond is The Air Force Electrical Engineer. He works at HQ AFCESA, Tyndall AFB, Fla.

Left: Directional boring lets civil engineers install piping and utility lines under roads, runways and other areas without tearing up the surroundings (photo courtesy Carlon®, a Lamson & Sessions company). *The operator's control panel (inset photo) includes a joystick similar to the ones found in many video games* (photo by Mr. Guy Ivie).

Decentralizing Elmendorf's Boiler Plant

Mr. Thomas A. Adams, P.E.
HQ AFCESA/CESM
Dr. Charles Culp, P.E.
Texas A&M University
Mr. Michael Forcht, P.E.
3rd CES/CEOE
Mr. Dean T. Nakasone, P.E.
HQ PACAF/A7CI

Recently, Elmendorf AFB, Alaska, tore down the central co-generation plant that had supplied electricity and heat to the base for over 50 years. The base switched over to the local utility's electrical grid and commissioned 233 boilers in 125 facilities (along with electric heating equipment in other buildings) to provide heat. This massive undertaking was the culmination of a $48M energy savings performance contract, the largest ever awarded by the Air Force. Bigger may indeed be better—the energy savings are already proving Elmendorf's undertaking to be one of the Air Force's most cost-effective ESPC projects.

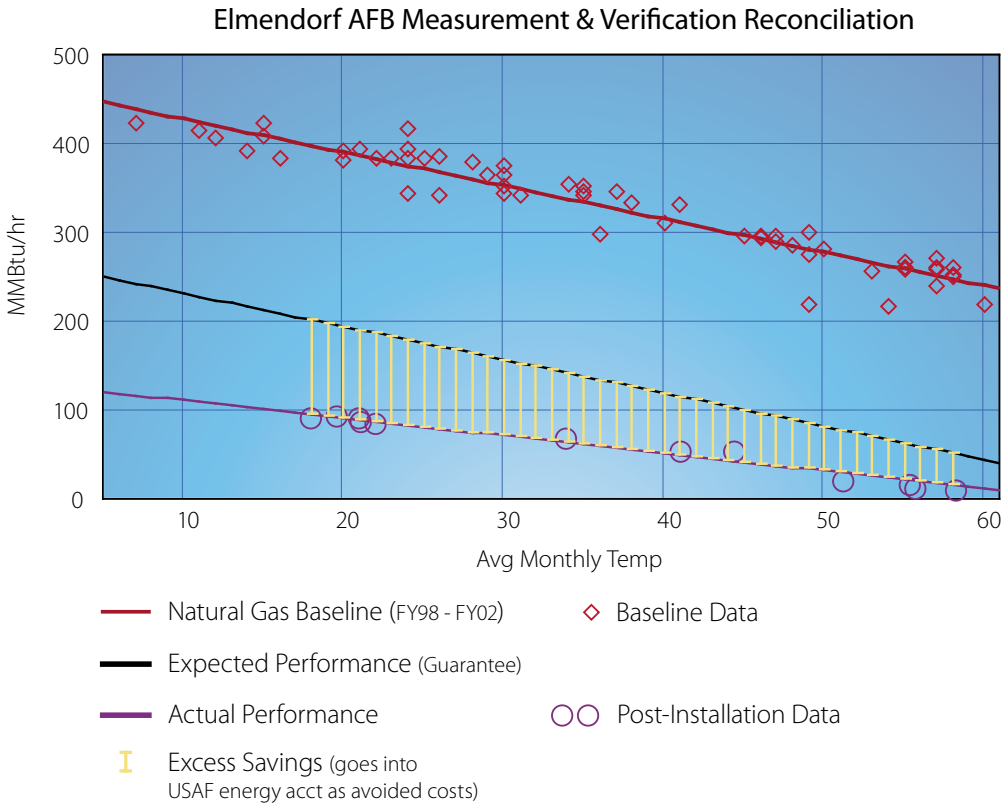
Originally built in 1953, Elmendorf's COGEN plant was simply designed and employed the commonly used Rankine steam cycle. Three 9.3 MW Westinghouse turbines easily satisfied Elmendorf's 20 MW peak electrical demand; six 150,000 lb/hr Erie City natural gas-fired boilers producing superheated steam at 720°F and 400 psig fed the turbines. Expanded to 70 psig within the turbines, the steam was saturated before being released into a 53-mile underground steam distribution system that served 145 main base facilities and six housing areas. When new, the system had good overall efficiency, often as high as 40% (traditional steam plant efficiency is 22–25%).

However, the underground steam distribution system degraded over time and little condensate returned to the plant. Obvious steam leaks were observed base-wide; during winter, snow-free stretches of bare ground were evident, caused by thermal heating from the steam lines below. In 2002, the cost of repairing the system was estimated at $100M.

Faced with the high repair estimate, the base considered other alternatives, including an energy savings performance contract, which uses projected energy savings as a funding source. Preliminary data provided by an energy services company showed it was economically feasible to replace the COGEN plant with decentralized boilers and electricity from the local electric utility grid. Based on this data, Elemendorf requested a detailed energy study to clearly define the project's scope, cost, and energy savings guarantees.

Mr. Eric Penland monitors boiler pressure at Elmendorf AFB, Alaska. (photo by Mr. Michael Forcht)

An appropriate energy consumption baseline was established using five years of historical monthly natural gas consumption data at the COGEN plant. The baseline correlated gas consumption with average monthly outside temperature. A computer simulation model was then used to predict individual facility loads. The difference between the established baseline and the model results formed the basis of the energy service company's guaranteed savings—the project's funding source. Finally, the costs of installing the individual facility boilers



was amortized against the now defined energy savings funding stream, which established a project payback of 22 years.

Natural gas meters were used to measure facility boiler natural gas consumption to ensure that the guaranteed savings are met. Ongoing part-time project management will assure that the boilers properly function at the guaranteed efficiency throughout the entire 22-year task order.

Construction ended in September 2005. Post-project annual energy consumption, measured after a one-year verification period, was compared against the baseline and the numbers were much better than expected.

Normalized for weather, first-year energy savings were 1,395,000 MMBtu/year, exceeding the 1,095,000 MMBtu/year guarantee by 27%. Even more impressive, Elmendorf's total annual base energy bill dropped $1.6M from FY05, despite the rise of natural gas prices by 43% ($2.55 per MMBtu, but at current gas rates, economic savings could be more accurately assessed at $4.9M).

As most in the CE community know, the Air Force is challenged to meet a congressionally mandated goal to reduce energy use by 2% per year. With this ESPC project, Elmendorf AFB made substantial progress toward that goal. The entire Air Force consumes ~77,000,000 MMBtu annually. With a reduction of 1,395,000 MMBtu/year, Elmendorf has single-handedly trimmed 1.8% from the Air Force's total annual energy consumption.

Mr. Adams is a Northrop Grumman contractor providing support to the Facility Energy Team, HQ AFCESA, Tyndall AFB, Fla. Dr. Culp is an associate professor in the Department of Architecture and the associate director of the Energy Systems Lab, Texas A&M University, College Station, Texas. Mr. Forcht is the Chief, Maintenance Engineering, 3rd CES, Elmendorf AFB, Alaska. Mr. Nakasone manages the Facility Energy Program at HQ PACAF, Hickam AFB, Hawaii.

Where's the Dumpster?

Mr. James Robertson
Mr. Robert Houston
Mr. Sean Sinclair
7th CES/CEV

Trash is a fact of life on an Air Force base, which is like a small city with a huge airport. Dyess AFB in Texas is no different—the base is home to the 7th Bomb Wing, and about 13,000 military and civilian personnel live or work on the 6,400-acre installation. At Dyess, the 7th Civil Engineer Squadron's environmental flight is responsible for compliance with federal, state and local laws and with Air Force regulations regarding solid waste (trash).

For contract maintenance purposes, trash and recycle dumpsters have to be tracked and logged; annual surveys catalog dumpster locations and note any necessary problems that need attention. Recently the Environmental Flight teamed with the Dyess GeoBase Office to develop a better way to track and maintain the base's dumpster inventory. Now surveyors use GPS equipment to pinpoint dumpster locations and load data directly into a customized form in ArcPad software. Data collection is quicker and data is more accurate and easier to use.

SrA Shaun Robertson, 7th CES, collects dumpster data with a handheld GPS unit. (Photo by Mr. Rob Houston)

With the old method, data was collected by driving by each dumpster and noting location and condition in a notepad. The amount of man-hours required with this method was a big problem, but there were others. The process took 20 days, long enough for dumpsters to be moved or removed and the data to become inaccurate before the survey was even complete. Exact locations were hard to record. Different data collectors meant notes had to be combined and interpreted and human error and inventory repetition often occurred. A better method was clearly needed.

The entire environmental team met with the GeoBase office to ensure that the new process met their needs, including the following: very little training needed for quick and simple data collection with an easy-to-carry/use device; a customized form with a screen of choices rather than fill-in-the-blanks; software that would collect, store, manipulate, and report data for trend or problem analysis or for tracking physical conditions.

The development team began by defining the dumpster attributes that need reporting, as well as the lists of choices for each attribute. This eliminated any discrepancies caused by different data collectors and created a clean database for querying. An "additional comment" field was added for issues not fitting the established option list. The GeoBase team used the defined attribute and choice list to develop a custom form in ArcPad Application Builder.

For ease of use, the form was kept as brief as possible. The first page of the form for this project contained all the vital information required for the survey. A unique identifier for each dumpster was generated

Data collection time is greatly reduced by using dropdown menus for data entry. (Graphic provided by 7th CES GeoBase Office)

by combining the building number that it was associated with, followed by an "R" for recycle or "T" for trash. The survey time and date—both required data—are automatically captured.

The GeoBase office had Trimble GeoXT GPS units with ESRI ArcPad software already installed and available to use for the survey. The GeoXT/ArcPad system is easily learned and lets users quickly collect data. A two-person collection team was trained in minimal time.

With the new method, one person collected dumpster data in only two days, resulting in a highly accurate inventory and a 90% reduction in man-hours required for this mission. Imported into ArcGIS, the collected data was analyzed and plotted on a map to determine what areas on the base were lacking proper trash/recycle service—those that need more units for their fill rate or those that require maintenance. Data will be grouped by year for record keeping and identifying trends; dumpsters with above-average damage rates will be noted for further investigation.

The benefits of this updated data collection method are many. Using these new techniques has allowed Dyess to get an accurate inventory of the dumpsters on base and to ensure that contract services are fully realized. When the data revealed that the number of dumpsters available was less than what the contract required, Dyess got the contractor to supply 20% more at no additional cost. The exact location information allowed analysis of most appropriate locations for sources of trash in relation to vehicular and pedestrian traffic patterns. Each dumpster was logged for routine maintenance, allowing the quality assurance evaluator to make certain the dumpsters were repaired correctly and in a timely fashion.

The savings in time and manpower, coupled with the increased quality and use of data, has made this project a winner for Dyess.

Mr. Robertson is Chief of Projects, Programs and Analysis Section, 7th CES, and is the Geo Integration Officer at Dyess AFB, Texas. Mr. Houston and Mr. Sinclair are Earth Tech contractors supporting the ACC GeoBase program at Dyess.

Indigenous Design for Expeditionary Locations

Maj Matthew Hutchings
13th SWS/MA
Lt Col Ellen England
72nd AMDS/SGPB

With a presence in almost every type of environment around the world, the military has a vested interest in learning to successfully cope with each extreme climate using the fewest resources. Basic Expeditionary Airfield Resources, or BEAR, assets constitute the majority of initial beddown facilities and infrastructure. As they deteriorate, they are often replaced with more durable facilities, especially on main operating bases where replacement facilities are usually prefabricated metal buildings. While these types of structures are quick and easy to procure, they are not effective in terms of energy efficiency or force protection.

One promising source of effective building technology for austere locations is indigenous design; time-tested concepts developed with local materials and in-depth knowledge of the environment. Using these low-level technology (low-tech), sustainable design concepts makes sense in military applications, particularly in light of the austere conditions typically found at deployed locations.

Before the introduction of modern conveniences such as electricity and air conditioners, traditional Middle Eastern cultures used simple building designs with advanced performance characteristics. Those cultures employed the most abundant building material—soil—and capitalized on the temperature-regulating ability of thermal mass in the form of thick adobe or rammed earth walls. They also facilitated ventilation by creating zones of sun and shade to induce convection air currents. Central courtyards circulated cool air to all rooms of the dwelling, and wind catchers harnessed the cooler prevailing breezes above street level. Arches and domes enhanced structural stability.

Building requirements for the current expeditionary setting are more complicated than those of traditional Middle Eastern buildings. These requirements include funding avenues, force protection measures, and fire safety, as well as host nation restrictions. This diverse list of criteria necessitates creative use of limited resources.

By combining indigenous knowledge with modern materials and methods, it is possible to construct highly efficient structures that meet mission requirements, are identifiable by the local culture, and support the local economy. Furthermore, if properly designed, these facilities have inherent characteristics that enhance force protection.

Suggested Design

Figure 1 shows a floor plan (first floor only) for a typical administrative facility for a main operating base. The design combines traditional building methods with modern concepts. If conventional practice were followed, each office would be a separate prefabricated metal building.

The layout is based on a modular, four-meter grid for ease of construction. The primary structural elements are centered on the grid and separate the exterior façade into bays. Each bay is covered by a barrel vault for added strength. The bays also facilitate repair of the walls should they be damaged in an attack by making a clear separation between wall sections. Only those sections with damage will need to be repaired.

The primary structure is composed of a reinforced concrete frame, while the infill is composed of load-bearing, reinforced rammed earth walls. The frame supports the barrel vaults and separates the rammed earth and adobe sacrificial panels at the end of each vault. The bond beams form bands around the entire structure at each floor level and act like the staves on a barrel to hold the entire structure together under seismic lateral forces. The four flying operation offices flank the central courtyard in two-story wings. The life support offices are housed in a two-story wing on the back side

of the courtyard. Personnel enter the compound at the front of the courtyard through a gate that can be closed and monitored for extra security.

To facilitate air circulation throughout the compound, the stair towers rise above the rest of the structure and double as windcatchers to harness desert breezes. The central courtyard serves as a cool, shaded area and a plenum to help circulate air to all the rooms that flank it. The barrel vaults help funnel air from the courtyard to the inner portions of the office.

The plans and elevations are prismatic in nature like much of traditional Middle Eastern architecture. Other architectural elements that are tied to local tradition include the barrel vaults and a relatively solid exterior that shields the compound's interior from the harsh desert sun as well as from the view of those on the outside. Parapet-topping finials and projections on the façade are common to traditional Middle Eastern architecture and channel erosion-causing rainwater away from the plaster covering the adobe walls.

Force Protection

Figure 2 (page 32) compares the typical prefabricated metal building wall section to the indigenous design wall section. The typical prefabricated metal building wall section is 200 mm thick; the indigenous design wall is 400 mm thick. The main prefab structural components are 160-mm metal studs; the main indigenous wall component is steel-reinforced rammed earth.

The prefab exterior is sheathed with 4-mm plywood and clad with 0.6-mm steel siding; this is too thin to withstand machine gun fire or mortars, necessitating the use of large concrete barriers around the exterior. The reinforced rammed earth wall can withstand a wide array of conventional weapons including small caliber machine gun fire, mortars, and rockets; the geotextile fabric on either side of the wall helps contain spalled material in the event of an explosive blast. It also has a 200-mm thick adobe sacrificial panel set 125 mm from the outside of the rammed earth wall; the panel and the gap further protect the inner wall from explosions. Preliminary analysis indicates that the need for concrete barriers can be eliminated, but specific testing of the effects of small arms on the proposed wall construction needs to be accomplished to be certain.

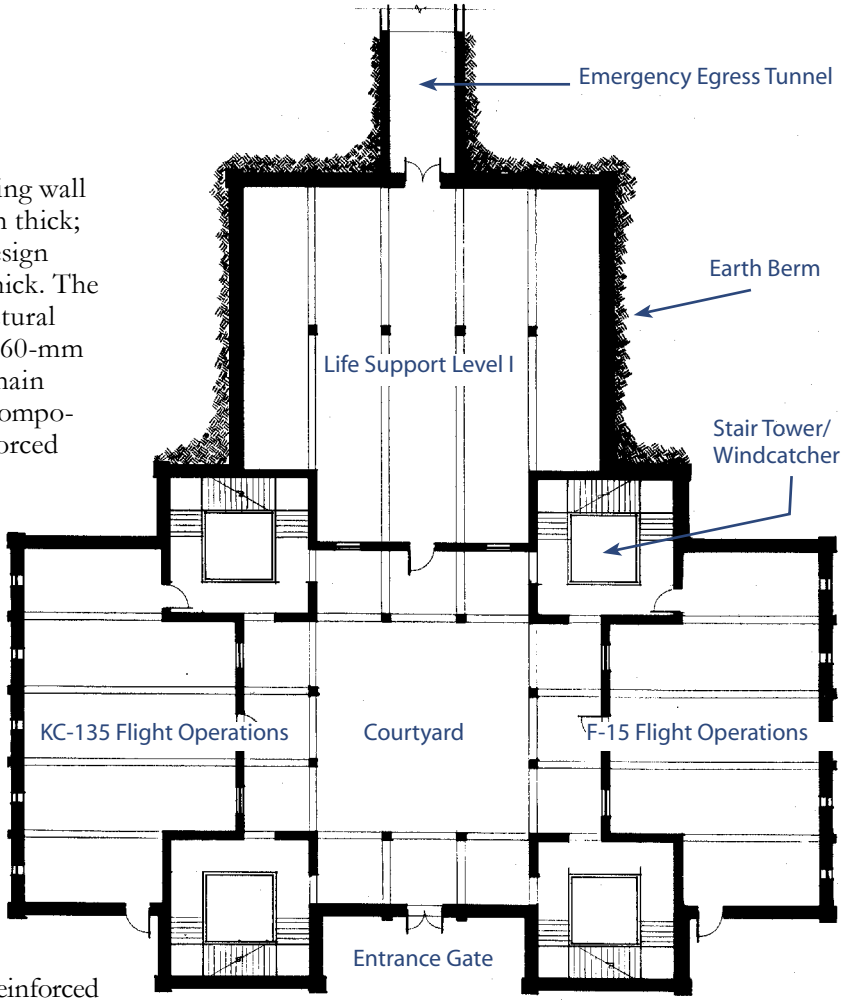


Figure 1: Floor plan of indigenous design building (ground floor)

The prefab interior walls are sheathed with 15-mm gypsum board, and the wall cavity is filled with 40 kg/m^3 rockwool insulation. The indigenous design walls are given a finished appearance with 15-mm gypsum board attached to 40-mm furring strips, and 50-mm rigid insulation between the main wall and the sacrificial panel offers an additional thermal barrier.

Fire Protection

The three major fire safety concerns of a designer are life safety, property protection, and continuity of operations. Since both designs

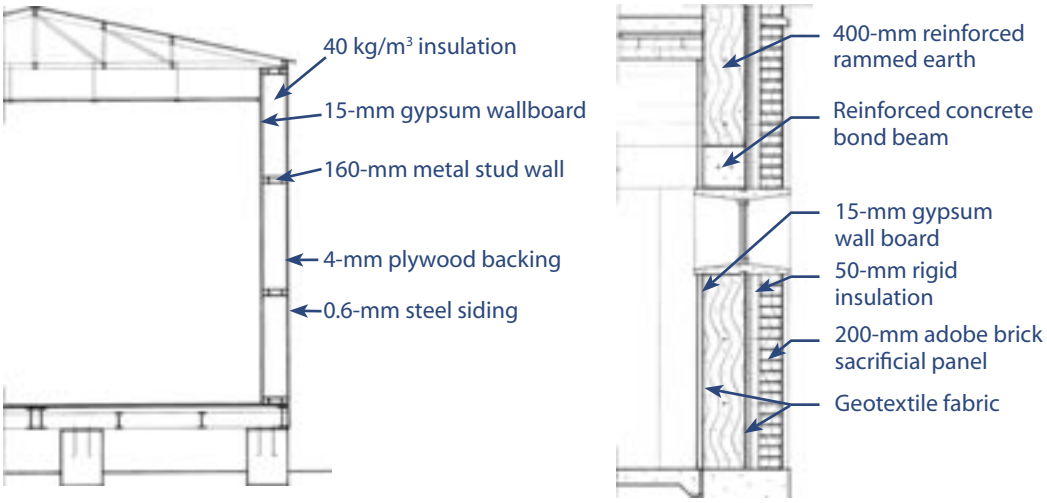


Figure 2: Comparison of prefab wall (viewed from side) and indigenous design wall (viewed from above)

have gypsum board for a finished interior wall surface, life safety concerns related to the products of combustion are the same.

Property protection refers to the survivability of the building under the intense heat of a fire, and continuity of operations refers to the ability to continue occupancy of the structure after a fire has occurred. Structural failure is a concern for firefighters and an important factor in determining whether the facility must be replaced. In studies of major structural fire effects on reinforced concrete and steel, reinforced concrete survived with very little, if any, strength reduction. Since reinforced rammed earth is comparable to reinforced concrete, its performance is expected to be similar. Structural steel members, like those in prefabricated metal buildings, showed signs of significant stress, if not complete failure, under the same fire-induced conditions. Most likely, the facility would need to be demolished and replaced, adversely affecting continuity of operations.

Construction Costs

Delivery time and cost are important considerations. Prefab trailers for the sample design can be delivered in approximately three to four months, at a cost of $690,000. In contrast, the construction time for the indigenous structure is approximately five months, at a cost of $1.17M. These calculations consider only initial cost and do not consider life-cycle costs. However, historical evidence has shown that earth structures can last for a century if not longer, vastly reducing the life-cycle cost. Metal buildings, on the other hand, last about ten years. Assuming this lifespan, the earth structure could pay for itself in ten years even without considering its inherent energy-saving advantages.

Indigenous architecture has promise and warrants consideration. It has inherent energy efficiency and favorable fire safety and force protection characteristics, although these are achieved at the cost of increased procurement time and at a high initial monetary cost. The time-tested techniques are not only effective in response to the harsh, local climate, they are also perceived favorably by the local people over imported construction techniques. With the potential of an extended presence in Southwest Asia, a small, culturally identifiable footprint is an important consideration that might enhance relations with our host countries. The benefits of indigenous architecture have the potential to improve the built environment for expeditionary installations.

Ed. Note: To view the complete thesis, visit the Scientific and Technical Information Network via the AFIT Library: http://stinet.dtic.mil/str/guided-tr.html. *Once there, search by the title "Indigenous Architecture for Expeditionary Installations."*

Maj Hutchings is the Support Officer, 13th Space Warning Squadron, Clear AFS, Alaska. Lt Col England is an ESOH Liaison, 72nd Aerospace Medicine Squadron, Tinker AFB, Okla. Maj Hutchings was a student and Lt Col England was an assistant professor in the Department of Systems and Engineering Management, AFIT, Wright-Patterson AFB, Ohio.

Team Travis Wins Again

SSgt Candy Knight
60th AMW/PA

Not even a rain-slick course could stop Travis AFB firefighters from winning a third consecutive World Firefighter Combat Challenge, held November 7–11, 2006, in Henderson, Nev.

The challenge attracts hundreds of U.S. and Canadian municipal fire departments from more than 25 locations. It gives firefighters a chance to show off their fitness and demonstrate the profession's rigors to the public.

During the competition, firefighters performed five tasks including climbing a five-story tower, hoisting and chopping, dragging hoses and rescuing a life-sized, 175-pound "victim"—all while wearing full-bunker gear, including an air-breathing apparatus.

"It was the toughest dog fight I ever saw, and the team rose to the occasion," said Mr. John Speakman, Travis AFB, Calif., fire chief.

"Our relay team competed six times on Friday and had no drama until the fifth run," Mr. Speakman said. "We were competing against Miami Dade during the tower portion and [TSgt] Mike Melton had a one-second lead."

It was at that crucial point when TSgt Melton slipped and his flashlight fell from his hand. "He couldn't find the flashlight right away in the dark and Miami Dade jumped ahead by a wide margin," said Mr. Speakman.

The Travis AFB team made up some time during the dummy drag when SSgt Harry Myers, using a last-minute burst of speed and energy, overtook the Miami Dade competitor and won the relay.

In other challenge competitions, team members Ms. Shenah Groom and Mr. Adam Groom earned third place honors in the team tandem event; TSgt Melton and SSgt Myers placed third and eighth, respectively, in the overall male division.

Although Travis AFB won the team portion of the challenge with a time of 4 minutes and 37.8 seconds, the competition and Mother Nature did not make it easy.

"The team event was on a cold day and there was even some drizzle towards the end," Mr. Speakman said. "When I arrived to watch the final day of competition, I received the bad news [SrA] Joe Almony had slipped and broken his hand.

"We focus on being one team, one fight and used that to overcome our obstacles," Mr. Speakman said. "The team has always been challenged by the highest level of competition at the event."

"This is yet another Team Travis success story involving active duty, Reserve, and civilian [members] and epitomizes the 'One team, one fight' concept," said Col Steve Arquiette, 60th Air Mobility Wing commander. "The fact that this is a three-peat for our firefighters just demonstrates how committed to excellence they are."

Travis AFB firefighters in the competition were TSgt Melton, SSgt Myers, Ms. Groom, Mr. Groom, Mr. Dave Chiodo, Mr. Aldrico Caragan and Mr. Joey Dominguez.

Ms. Shenah Groom carries a 175-pound "victim" to the finish line during the tandem portion of the 2006 World Firefighter Combat Challenge.
(photo by SMSgt Jeff Vaughn)

2006 Air Force

The Air Force and three civilian professional associations recently announced their 2006 Air Force civil engineer award winners. Each year, the Air Force civil engineer community partners with the Society of American Military Engineers, the National Society of Professional Engineers, and the Northeast Chapter of the American Association of Airport Executives to sponsor the awards. The winners are honored at a ceremony in Washington, D.C., in February. Winners (highlighted in bold) and runners-up (where applicable) are listed here.

Outstanding Civil Engineer Unit Award and the Society of American Military Engineers Major General Robert H. Curtin Award

Large Unit

3rd CES, Elmendorf AFB, Alaska

99th CES, Nellis AFB, Nev.

Small Unit

100th CES, RAF Mildenhall, United Kingdom

437th CES, Charleston AFB, S.C.

Air Reserve Component

118th CES, Nashville Tenn.

419th CES, Hill AFB, Utah

Brigadier General Michael A. McAuliffe Award (Housing Flight)

718th CES, Kadena AB, Japan

52nd CES, Spangdahlem AB, Germany

Major General Robert C. Thompson Award (Resources Flight)

15th CES, Hickam AFB, Hawaii

37th CES, Lackland AFB, Texas

Brigadier General Archie S. Mayes Award (Engineering Flight)

27th CES, Cannon AFB, N.M.

51st CES, Osan AB, Republic of Korea

Major General Clifton D. Wright Award (Operations Flight)

341st CES, Malmstrom AFB, Mont.

27th CES, Cannon AFB, N.M.

Chief Master Sergeant Ralph E. Sanborn Award (Fire Protection Flight)

437th CES, Charleston AFB, S.C.

18th CES, Kadena AB, Japan

Senior Master Sergeant Gerald J. Stryzak Award (Explosive Ordnance Disposal Flight)

56th CES, Luke AFB, Ariz.

775th CES, Hill AFB, Utah

Colonel Frederick J. Riemer Award (Readiness Flight)

Active Duty

435th CES, Ramstein AB, Germany

436th CES, Dover AFB, Del.

Air Reserve Component

439th CES, Westover ARB, Mass.

103rd CES, East Granby, Conn.

Environmental Flight Award

437th CES, Charleston AFB, S.C.

72nd ABW/CEV, Tinker AFB, Okla.

Major General Joseph A. Ahearn Enlisted Leadership Award

CMSgt Robert M. Buchanan, 56th CES/CEM, Luke AFB, Ariz.

CMSgt Todd A. Gumprecht, 48th CES/CEO, RAF Lakenheath, United Kingdom

Major General William D. Gilbert Award

Officer

Maj Arno J. Bischoff, HQ ACC/A7XE, Langley AFB, Va.

Maj Christopher K. Fuller, HQ AMC/A7Z, Scott AFB, Ill.

Enlisted

MSgt Dean E. Hardin, HQ USAFE/A7CCE, Ramstein AB, Germany

SMSgt Randall S. Vis, HQ ACC/A7XE, Langley AFB, Va.

Civilian

Mr. Stephen C. Matthews, HQ USAFE/A7CPH, Ramstein AB, Germany

Mr. Steven A. Dumont, HQ ACC/A7CO, Langley AFB, Va.

Harry P. Rietman Award (Senior Civilian Manager)

Mr. Stephen A. Bartek, 3rd CES/CEO, Elmendorf AFB, Alaska

Mr. Wayland H. Patterson, HQ AFCESA/CEXX, Tyndall AFB, Fla.

Major General L. Dean Fox Award (Outstanding Civil Engineer Senior Military Manager)

Lt Col Douglas D. Hardman, 16th CES/CC, Hurlburt Field, Fla.

Lt Col Craig S. Biondo, 775th CES/CC, Hill AFB, Utah

Major General Eugene A. Lupia Award

Military Manager

Capt Brian E. Baumann, 4th CES/CED, Seymour Johnson AFB, N.C.

Capt Paul W. Fredin, 305th CES/CEC, McGuire AFB, N.J.

Military Technician

SSgt Joseph J. Upton, 775th CES/CED, Hill AFB, Utah

SrA Rebekah B. Diky, 43rd CES/CEX, Pope AFB, N.C.

Chief Master Sergeant Larry R. Daniels (Outstanding Civil Engineer Military Superintendent)

SMSgt Muhammad W. Mustafa, 305th CES/CED, McGuire AFB, N.J.

MSgt Michael A. Pitts, 15th CES/CED, Hickam AFB, Hawaii

Outstanding Civil Engineer Civilian Manager

Mr. Steven A. Robertson, 305th CES/CEX, McGuire AFB, N.J.

Mr. Edward B. Jennings, 17th CES/CECS, Goodfellow AFB, Texas

Outstanding Civil Engineer Civilian Supervisor

Mr. James M. Tully, 305th CES/CEC, McGuire AFB, N.J.

Ms. Deborah A. Buck, 30th CES/CEH, Vandenberg AFB, Calif.

Outstanding Civil Engineer Civilian Technician

Mr. William J. Omeara IV, 36th CES/CEF, Andersen AFB, Guam

Civil Engineer Awards

Mr. Aaron D. Grindland, 16th CES/CEFO, Hurlburt Field, Fla.

Outstanding Civil Engineer Individual Mobilization Augmentee Air Reserve Component

Officer Manager

Col Brent E. Hill, HQ AFCESA/CES, Tyndall AFB, Fla.

Lt Col Kerri O. Grimes, 916th CES/CC, Seymour Johnson AFB, N.C.

Senior NCO Manager

SMSgt Larry V. Keesee, 314th CES/CEOIW, Little Rock AFB, Ark.

SMSgt Robert P. Walls, 375th CES/CEX, Scott AFB, Ill.

NCO Manager

TSgt Jonathan Bussey, HQ PACAF/A7XX, Hickam AFB, Hawaii

TSgt Gaylen Fish, 775th CES/CEF, Hill AFB, Utah

Major General Augustus M. Minton Award (Outstanding Air Force Civil Engineer Magazine Article)

Dr. Daryl I. Hammond, HQ AFCESA/CESM, Tyndall AFB, Fla.

Capt Alesandra L. Neiman, 27th CES/CEC, Cannon AFB, N.M.

Outstanding Community Planner

Mr. Paul E. Hughey, 435th CES/CEC, Ramstein AB, Germany

Mr. Carl T. Hoffman, HQ AFSOC/A7CV, Hurlburt Field, Fla.

Society Of American Military Engineers' Major General James B. Newman Medal

Col James S. Brackett, HQ AMC/DA7, Scott AFB, Ill.

Col William M. Corson, HQ PACAF/A7, Hickam AFB, Hawaii

Society Of American Military Engineers' Major General Guy H. Goddard Medal

Active Duty

SMSgt Stephen W. Batherson, 99th CES/CEOP, Nellis AFB, Nev.

SMSgt Steven D. Holman, 52nd CES/CEOH, Spangdahlem AB, Germany

Air Reserve Component

MSgt Grady C. Raynor, Jr., 916th CES/CEMB, Seymour Johnson AFB, N.C.

MSgt Timothy Joel Eichman, HQ AETC/A7COX, Randolph AFB, Texas

National Society Of Professional Engineers' Federal Engineer of the Year

Military

Maj Kevin L. Parker, HQ USAFE/A7CE, Ramstein AB, Germany

Civilian

Dr. Garrett D. Polhamus, AFRL/HED, Brooks City Base, Texas

Balchen/Post Award (awarded by the Northeast Chapter of the American Association of Airport Executives for snow and ice removal)

3rd CES, Elmendorf AFB, Alaska

735th CES, Ramstein AB, Germany

Senior Leaders Meet

Civil engineers throughout the Air Force came together to discuss key issues affecting the entire career field at the Air Force Civil Engineers Senior Leaders Meeting held at Randolph AFB, Texas, Decmeber 5–8, 2006. Maj Gen Del Eulberg and the group focused on the three critical areas of readiness, transformation, and combat support. The meeting's theme was "Honoring Our Past, Tranforming to Meet the Future," as he welcomed dozens of Civil Engineering's Founders. These former officer, enlisted, and civilian leaders listened to updates on today's accomplishments and tomorrow's challenges while offering their perspectives based on years of experience.

Cape Gets New Generation Electrical System

TSgt Lisa Lusé
45th SW/PA

It will take a mighty strong hurricane to affect the electrical power system at Cape Canaveral AFS in Florida now that the power dispatch center has been replaced.

In the last five years, the overhead wiring and cable—providing power to the base since the 1960s—have been replaced with underground wires and cables.

"The average lifespan for the wiring system is 20–30 years; ours is 40 years old." said Mr. James Murphy, 45th Civil Engineer Squadron space range electrical engineer. "The new power system will be much more reliable and much safer."

At a cost of $35M to date, Cape Canaveral AFS has developed a new power dispatch office and installed underground cables to prevent frequent power outages. "If you look at it, we had doubled the unscheduled outages in the last two years due to the aging of the system and because of the hurricanes," said Mr. Murphy.

The worst weather generally occurs in July, August, and September, with afternoon storms causing the highest number of unscheduled outages. It's usually after a day or two of high hurricane wind gusts, twisting and shaking the metal, when the power hardware weakens and fails.

"The hurricanes from the past two years really stressed our power system," said Mr. Murphy. "The weather puts a lot of stress on our electrical system and fatigues the hardware."

Lightning strikes were also a hazard for the open wiring; Florida is considered the national lighting strike capital.

Salt corrosion has been a major contributor to power system damage. According to Mr. Murphy, steps have been taken to limit further salt corrosion, such as moving power equipment inside buildings or constructing concrete and stainless steel enclosures.

A new computer map of the distribution system will show locations where damage has occured.

Power coordinators monitor all power systems. They provide all switching orders and deal with both scheduled and unscheduled outages. "We've been able to get our systems up within 24 hours," said Mr. Murphy.

Saving Funds... One Blade at a Time

Mr. Wayne Fordham
HQ AFCESA/CESM

Base Civil Engineers looking for ways to save funds and conserve energy should take a closer look at their grounds maintenance. It's often possible to make changes that reduce the overall cost of grounds maintenance without detracting from a base's appearance.

As defined in AFI 32-7064, the level of intensity for maintenance of Air Force grounds falls into one of the following categories: improved, semi-improved, or unimproved.

Lowering the level of maintenance intensity—shifting from improved to semi-improved, or from semi-improved to unimproved—decreases the need for mowing, fertilization, pesticide application, and irrigation.

Several bases have impressive accomplishments in maintaining low-priority areas.

Since the early 1990s, Dyess AFB, Texas, has converted approximately 1,800 acres of semi-improved grounds to unimproved grounds, a move resulting in an annual savings of $171K in grounds maintenance costs. Recently, even more savings—$10.5K annually—were added as more acreage was converted to unimproved grounds through a restoration and conservation of riparian corridors project along the Little Elm Creek diversion system. This project has also proven effective in reducing erosion along the creek channels. Managers at Dyess have saved an additional $273K in annual energy costs by partnering with the City of Abilene to use effluent water for irrigation at the base's golf course and on other highly maintained areas. The base utilizes drip irrigation systems to further reduce grounds maintenance water requirements.

Aviano AB, Italy, like all overseas bases and several stateside remote bases, maintains its golf course with appropriated fund support from the local BCE office. (Normally maintenance cost for golf course operations is paid with non-appropriated funds.) To reduce the cost of grounds maintenance, Aviano is converting semi-improved areas (roughs) on its course to unimproved areas.

At Volk Field, Wis., an Air National Guard base, 41 acres have been completely eliminated from mowing and 24 acres have gone from weekly to monthly mowing schedules. The Guard is keenly aware of the need to save funds in the area of grounds maintenance on its bases, a move which frees resources to accomplish high-priority maintenance work on buildings and utility systems.

Lessening maintenance levels in selected areas will involve naturalization of the landscape. Managers must effectively communicate the rationale for such changes in their base's appearance. Choosing areas for less intense maintenance must be done in coordination with the safety department, the fire department, and senior management.

For more information, please contact the author through AFCESA's Reachback Center via e-mail at AFCESAreachbackcenter@tyndall.af.mil, via DSN at 523-6995, or toll-free at 1-888-232-3721.

Aviano AB, Italy, converted roughs on its golf course from semi-improved to unimproved in order to cut maintenance costs. (U.S. Air Force photo)

Tech Courses On Target

Capt Jonathan Gray, P.E.
Capt Brian Ballweg
Capt John Volcheck
AFIT/CEM

Lessons learned from Operations Enduring Freedom and Iraqi Freedom revealed that deploying engineers would benefit from additional technical education focused on expeditionary and semi-permanent infrastructure and facilities. Responding to this need, the Civil Engineer and Services School at the Air Force Institute of Technology at Wright-Patterson AFB, Ohio, is introducing several new courses.

ENG 571: Power System Design

Most recently, CESS re-energized the Power System Design course in response to ongoing reconstruction missions and home-station efforts to recapitalize electrical infrastructure. ENG 571 uses an innovative combination of distance learning and residence material to field a comprehensive graduate-level course that bridges the gap between electrical engineer undergraduate education and the specialized power system skill set.

The eight-week, self-paced, DVD-based phase of the course includes topics such as Airfield Lighting Design, Short-Circuit Protection, Lightning Protection, Contingency Power Systems, and Power Flow Analysis. The distance-learning portion is followed by a one-week seminar in residence at AFIT.

The first offering ended on Oct. 20, 2006, and resulted in the unprecedented course rating of 4.86 on a 5.0 scale. This wasn't a typical continuing education seminar—students reverse-engineered Wright-Patterson AFB power systems and toured base substations, the airfield lighting vault, auxiliary generators, and facility electrical systems. They were able to discuss designs with engineers, AFCESA experts, and technicians to better understand how to get from the design table to the construction site. One student stated "this course doubled my confidence and technical competence."

ENG 481: Simplified Facility Design

The third offering of ENG 481 will be in March 2007. This course includes principles and techniques for designing simple facilities. A significant number of hours are dedicated to civil, structural, roofing, plumbing, mechanical, electrical, and fire prevention design fundamentals. Design considerations include site selection, anti-terrorism/force protection/resource protection, load calculations, and code compliance. The capstone design exercise is geared toward RED HORSE-constructed pre-engineered buildings.

ENG 561: HVAC Design & Analysis

In July 2007, CESS will offer ENG 561, an advanced heating, ventilating, and air conditioning course that will follow the same distance-learning format as ENG 571. The course is intended to enable mechanical engineers to design and select complete HVAC systems and to transition students from undergraduate thermal systems theory to practical design applications.

For more information regarding CESS technical courses, e-mail cess@afit.edu.

ENG 481 students observe hangar construction techniques as part of their coursework. (photo by Capt Brian Ballweg)

AFIT

Wright-Patterson AFB OH

Course No.	*Title*	*Start Dates*	*End Dates*	*Reg. Deadline/Comments*
WENG 481	Simplified Facility Design	05-Mar	16-Mar	19-Feb
WMGT 436 (S)	Maintenance Engineering	05-Mar	09-Mar	08-Feb
WENV 532	Advanced Air Quality Management	05-Mar	09-Mar	08-Feb
WENV 020 (S)	ESOH Compliance Assessments	12-Mar	15-Mar	15-Feb
WMGT 400	CE Commander/Deputy Course	26-Mar	06-Apr	12-Mar
WMGT 570	CE Superintendent	26-Mar	06-Apr	12-Mar
WESS 030 (W)	Industrial Stormwater Management	02-Apr	06-Apr	19-Mar
WMGT 438 (W)	Logistics Management	02-Apr	27-Apr	19-Mar
WESS 070 (S)	Hazardous Materials Management	03-Apr	03-Apr	09-Mar
WMGT 423 (S)	Project Programming	09-Apr	20-Apr	15-Mar
WENV 419	Envir. Planning, Programming & Budgeting	10-Apr	12-Apr	27-Mar
WESS 010 (W)	Hazardous Waste Accumulation	16-Apr	20-Apr	02-Apr
WMGT 412	Financial Management	16-Apr	27-Apr	02-Apr
WMGT 406	Housing Flight Commander Course	30-Apr	04-May	16-Apr
WENV 222	Hazardous Materials Management Process	30-Apr	04-May	16-Apr
WMGT 422 (S)	Project Management	30-Apr	04-May	05-Apr
WENV 418	Environmental Contracting	07-May	18-May	23-Apr
WMGT 426 (S)	SABER Management	08-May	10-May	13-Apr
WENV 220 (S)	Unit Environmental Coordinator Course	14-May	18-May	19-Apr
WENV 101	Intro. to Envir. Management Flight	21-May	25-May	07-May

**ISEERB-approved for all DoD components*

Resident courses are offered at Wright-Patterson AFB, Ohio. Registration begins approximately 90 days in advance. Students should register for CESS courses through the online registration process. Visit the CESS Web site at http://www.afit.edu (under Continuing Education) for satellite (S) and Web (W) classes.

All AFTR, All the Time

SMSgt Dale Littles
HQ AFCESA/CEOF

Air Force Training Record is here and COVER Train is gone. The conversion to AFTR is now complete and it's mandatory: all CE personnel involved in the training process—unit education training managers, supervisors, trainers, certifiers, and trainees—should now be using AFTR.

The AFTR program contains the most current Career Field Education and Training Plans, Qualification Training Packages, and other OJT training documentation for all 14 CE AFSCs.

To access the AFTR program each person must register on the CE Virtual Learning Center at https://afcesa.csd.disa.mil, then select the "my training" tab and open the AFTR link. Units that provided COVER Train databases to AFCESA will find their data preloaded in the AFTR program. All others should provide the AFCESA Helpdesk (afcesareachbackcenter@tyndall.af.mil) with the name, rank, unit, base, and MAJCOM of their Unit Education and Training Manager to be assigned rights. UETMs can refer to the "How To Guides" in the AFTR program located under the training tab. Web-based training modules are available on the VLC by selecting "my courses."

For more information, or for technical questions, please contact SMSgt Terry Lanton, HQ AFCESA/CEOF, DSN 523-6113, commercial 850-283-6113; or SMSgt Gerald Schenck, HQ AFCESA/CEOF, DSN 523-6373, commercial 850-283-6373.