

Air Force **CIVIL ENGINEER**

Volume 13 • No. 3 • 2005



Recovering from Katrina

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2005		2. REPORT TYPE		3. DATES COVERED 00-00-2005 to 00-00-2005	
4. TITLE AND SUBTITLE Recovering from Katrina. (Air Force Civil Engineer, Volume 13, Number 3, 2005)				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Civil Engineer (AFCESA/PCT),139 Barnes Drive, Suite 1,Tyndall AFB,FL,32403-5319				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 36	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Transitions

Summer's heat has given way to autumn colors, but regardless of the season, I hear nothing but outstanding reports of engineer support across the Air Force.

As part of our Back to Bases initiative, we recently established the Reach-back Center at AFCESA as a central repository for CE-related information and a one-stop source for peacetime and contingency information. Within their first four months, the RBC answered over 2,500 calls and emails on a broad spectrum of CE-specific questions. They are also building an impressive set of example designs for contingency beddown sites. I encourage you to use this resource to aid in maintaining our bases.

The 2005 Base Realignment and Closure Commission forwarded its recommendations to the President in September. The process continues and is expected to be finalized when the legislation is signed in December 2005. The Commission's proposal to the president changed several significant Air Force recommendations. Once BRAC 2005 is enacted, our work in implementing closures and realignments will begin and, as always, civil engineers will lead the way.

Integral to BRAC is the Joint Basing initiative, which identified a dozen locations for consolidation; one Service will be the primary installation support provider for nearby installations belonging to one or more other Services. The initiative's first step is defining the Common Delivery of Installation Support, a task involving the entire installation support community, across all the Services. ILE leads this effort for the Air Force, and your support to this point has been outstanding. Service Standard Teams are meeting for each of the installation support functions, with the demanding task of developing common output level standards for DoD. As the CSAF's '05 July 5 Sight Picture highlighted, the Air Force supports joint basing for the efficiencies and savings it can bring. Our underlying precepts are that 1) Airmen will command Airmen, 2) Airmen will open and operate airfields, and 3) the Air Force will achieve improvements without negative impact to our warfighting capability. We will not support lower standards for our Airmen. After developing standards for all installations, the next step will be to develop an implementation strategy. Today, McChord, McGuire, and Bolling AFBs are working with their Army and Navy counterparts to map the way for this transformational effort.

Finally, 2005's 101 Critical Days of Summer took a severe toll on our personnel, and Hurricane Katrina delivered a devastating blow to the Southeast. Civil engineers responded quickly: RED HORSE assisted recovery efforts at Keesler AFB and Prime BEEF teams deployed into the New Orleans and Gulfport areas to bed down the relief effort and assist in evacuations. Several bases served as reception locations for transiting evacuees to local- and state-run shelters, including Lackland AFB, which handled transit for over 11,000 people. I am extremely proud of our civil engineers and their service during this national crisis. I encourage you to remain vigilant and take care of yourself and your people.

As this year comes to a close, Sallie and I wish you and your families a safe and enjoyable autumn!

L. Dean Fox
Major General, USAF
The Air Force Civil Engineer



photo by Mr. Keith Fred

From the Top



Air Force CIVIL ENGINEER

Volume 13, No. 3, 2005

COMMAND FOCUS: Air Education and Training Command	4
Katrina Batters Keesler	6
<i>Compilation</i>	
Providing a Roost for the Raptor	8
<i>Mr. Mark O. Hunt</i>	
Ramping Up for AM-2's Replacement	10
<i>Mr. Joe Fisher</i>	
Ensuring a Safe Landing	12
<i>MSgt Mike Chapman</i>	
Using the Best Approach	14
<i>Mr. Roger Williams</i>	
These Gates Don't Stand Ajar	16
<i>MSgt Paul Fazzini</i>	
FROM THE FRONT	18
TECHNOLOGY	21
CONSTRUCTION NOTES	24
CE WORLD	24
EDUCATION & TRAINING	32



A Roost for the Raptor p. 8



Ensuring a Safe Landing p. 12



Gates... p. 16

Air Force Civil Engineer
Volume 13 • No. 03 • 2005
ISSN 1555-8991



Air Force Civil Engineer is published quarterly as a funded newspaper by the Professional Communications staff at the Air Force Civil Engineer Support Agency, Tyndall AFB, Fla. This publication serves the Office of The Civil Engineer, HQ U.S. Air Force, Washington, D.C. Readers may submit articles, photographs and artwork. Suggestions and criticisms are welcomed. All photos are U.S. Air Force, unless otherwise noted. Contents of *Air Force Civil Engineer* are not necessarily the official views of, or endorsed by, the

U.S. government, the Department of Defense or the Department of the Air Force. Editorial office: *Air Force Civil Engineer*, AFCEA/PCT, 139 Barnes Drive, Suite 1, Tyndall AFB FL, 32403-5319, Telephone (850) 283-6242, DSN 523-6242, FAX (850) 283-6499, and e-mail: cemag@tyndall.af.mil. All submissions will be edited to conform to standards set forth in Air Force Instruction 35-301 and The Associated Press Stylebook. *Air Force Civil Engineer* is accessible on the Internet from AFCEA's home page: <http://www.afcesa.af.mil>.

The Civil Engineer
Maj Gen L. Dean Fox
AFCEA Commander
Col Gus G. Elliott, Jr.

Chief, Professional
Communications
Dr. Ronald Hartzler

Chief, Public Affairs
MSgt Michael A. Ward

Editor
Teresa Hood

Graphic Designer
Guy Ivie



On the cover:
SSgt Joshua Copeland,
deployed from the 375th
CES at Scott AFB,
Ill., as part of the 4th
ECES, cuts through a
downed tree in a New
Orleans neighborhood
on Sept. 13.
(photo by SSgt Bryan
Bouchard)

Command Air Education & Focus Training Command

Ms. Teresa Hood
Editor



First impressions are important, and the civil engineers at Headquarters Air Education and Training Command know it.

"We recruit, assess, and train all new Airmen; we're their first command and their first impression of the Air Force," explained Col Leonard Patrick, HQ AETC's Civil Engineer. "At the same time, we're a continuing presence for them, because we're responsible for the education and training they receive throughout their Air Force career. What we do here in civil engineering plays a large part in making their first and continuing impressions the best possible."

Last year, AETC trained over 250,000 Airmen in aircrew and technical skills. Over 15,000 students attend Air University at Maxwell AFB, Ala., every year. AETC has nine flight training bases and flies 577,000 training hours per year—41% of the total Air Force flying hours.

These statistics equate to a lot of work for the command's CEs: students need dorms and classrooms; equipment and aircraft for training need facilities and flight lines; and instructors, trainers and support personnel all need places to live and work. While the Dorm Master Plan (DMP) involves all commands, it's particularly important at AETC where student housing is one of the most pressing needs.

"At AETC, training is our operations," said Col Steve Lillemon, Engineering Division Chief. "The limiting factor in our student training production has proven to be dorms,

not classroom availability—we could train in three 8-hour shifts if we had to." In FY06, under the DMP, AETC will use \$85.1M in FY06 military construction (MILCON) funds to add 864 dorm rooms at four of their training bases. Overall, AETC is slated to receive \$456M in the DMP from FY04-09, primarily for pipeline dorms, most of which will be built at one of their main training bases, Sheppard AFB, Texas.

"Sheppard is definitely one of our largest—we have several 300-room dorms there," said Mr. Dennis Guadarrama, who oversees MILCON construction for AETC's training bases. "In the building process, we're also developing a new campus plan for Sheppard's tech-training students. It will be pedestrian-only and look more like a typical college campus." Sheppard will also be the first place AETC tries out its design-build hybrid acquisition strategy, which was developed in conjunction with the U.S. Army Corps of Engineers in Tulsa, Okla.

"Our FY06 dorm at Sheppard will be the inaugural dorm for the design-build hybrid concept," stated Col Lillemon. "It's basically a best-value source selection process, but it gives us the possibility of five years' construction under a single design-build contract. Of course it's performance-based, and if it works as we anticipate, we'll save on costs and time, through a more efficient construction process."

AETC's CEs hope to pull off another first in FY06-07—the first command to completely privatize military family housing. Lackland

AFB, Texas, has been privatized since 1998—one of the first in the Air Force—and housing at Little Rock AFB, Ark., was privatized in 2004. Using an innovative acquisition approach that awards contracts for “groups” of bases, AETC plans to have 100% of its housing (9,035 homes) privatized by the 2007 deadline, if not before. “Bases within a group are in different geographic regions, so we’re able to leverage the commercial viability across the board, and not in just one area,” explained Col Bryan Kuhlmann, AETC’s Chief of Programs. “We’re in the source selection process for our Group 1—four bases—and well into the [request for proposal] development for our Group 2—seven bases—which should close out our command. It also helps with housing standardization and saves us time.”

AETC isn’t just the “First Command” for an Airman; it’s usually the first stop in the Air Force for a new weapons system, as well. “When you have a new mission beddown—like the F/A-22—the first operational facilities come into our command,” said Col Patrick.

“New weapons have to come to us first, before they go to an operational command, to teach the operators and maintainers how to use them,” said Col Kuhlmann. “I had heard that, but I really never grasped what it meant until I came to AETC. New mission beddown is a huge piece of our effort.”

Readiness is another important part of AETC’s mission. “We focus heavily on readiness because we owe our young people

the opportunity to get the training they need before they deploy,” said Col Patrick.

“AETC is unique in that our primary contribution toward the Air Force’s warfighting effort is training Airmen to do their job, as well as sustaining the installation where they train,” stated Lt Col Thomas Mitchell, AETC’s Chief of Readiness. “But we also deploy—we have well over 1,000 people postured in our UTCs, and we have folks going in every window. Right now we have 173 CEs deployed, spanning at least 10 locations.”

Everything at AETC keeps coming back to the “First Command.”

“We have to. We’re the lifeblood of the Air Force,” said Col Patrick. “We provide the workforce in all skill sets, so that we can fly the jets, fix the jets, maintain the base, everything. Our biggest role as CEs is to make sure that the infrastructure is available to do the training, to sustain the base, to meet the training mission.”



Colonel Leonard A. Patrick has been The Civil Engineer for Headquarters Air Education and Training Command since April 2005. He was commissioned in 1981 after graduating from the U.S. Air Force Academy with a B.S. in Civil Engineering; he has an M.S. in Mechanical Engineering from the Boston University Overseas Program. He has served in various base-level and headquarters assignments. From Randolph AFB, Texas, Col Patrick is responsible for providing functional leadership and technical guidance to civil engineer units supporting the more than 66,000 active-duty members and 15,000 civilians at AETC's 13 bases.

Katrina Batters Keesler

Compiled from news stories and press releases

Keesler AFB, one of Air Education and Training Command's major technical training bases, sits in southern Mississippi, near the Gulf of Mexico and the Bay of Biloxi. A railway runs past the front gate, and past the tracks is Highway 90. Or at least that's the way it was before Katrina came calling.

On Monday, August 29, Hurricane Katrina smashed "a good 95 percent" of Keesler, turning it into a pile of debris and mud, according to Lt Col Claudia Foss, 81st Training Wing Public Affairs office.



This restroom lies between the 12th and 13th holes on the back nine of Keesler's golf course. Katrina's storm surge raised the level of the Back Bay nearly 30 feet above normal. (U.S. Air Force photo)

"Whether it was five feet, one foot or a few inches, at one point everything was covered with bay or gulf water," she said.

"The wind was still blowing

when we went out on Monday to assess damage," said Mr. Brian Drake, deputy commander of the 81st Civil Engineer Squadron.

"Initial reports showed drastic damage to the industrial and housing areas," said Maj Ray Mottley, 81st CES commander. Near the base front gate that faces the Gulf, six-foot deep

water flooded the commissary and exchange stores. Many buildings have missing roofs and walls. Damage to the housing area is extensive; even homes that didn't suffer heavy structural damage are unliveable.

Officials at the Air Force Climatology Center at Offutt AFB, Neb., said that winds of 50 mph buffeted the base for most of the time, with gusts over 90 mph. "Power lines are down," said Lt Col Foss. "We've got light poles that are just bent over." Mississippi Power expects the Gulf Coast to be without power for at least three weeks.

"We're using generators to power our critical facilities," explained Maj Mottley. "However, the base hospital is completely without power at this time due to the water surge from the Back Bay, which flooded the basement." Base officials said that more than 25 critical patients were medevaced to Wilford Hall at Lackland AFB, Texas, along with 31 pregnant women in their third trimester.

Although runway lights and navigation aids were damaged, the runway can still support C-17 Globemaster III and C-130 transport aircraft for daylight operations. Commanders from other bases have promised aid, and some is already arriving. Teams from NAS Pensacola are flying helicopters into Keesler for search and rescue operations. A team of RED HORSE engineers drove in to help clear the debris (see p. 24).



As Hurricane Katrina struck Keesler, rising waters swallowed cars parked along streets. (U.S. Air Force photo)

The Air Force Civil Engineer Support Agency at Tyndall AFB, Fla., is also lending a hand. A team went out to evaluate the damaged runway, and the Civil Engineer Maintenance, Inspection and Repair Team sent three trailer-sized, 500-kilowatt generators.

Although the power is out, other utilities are functional. "We do have drinking water. We do have the sewage system up and running," said Lt Col Foss.

More than 6,000 people rode out the storm in seven shelters on base. They ventured outside for the first time on August 31, and got their first hot meal since the storm. It was also their first chance to see the devastation in the housing area.

Personnel scheduled to report to Keesler and those who evacuated have been told not to report to the base. According to Brig Gen William Lord, 81st Training Wing commander, until the

base can be made operational, "we will suspend training and ask other bases to support our training mission."

Brig Gen Lord also told Airmen to treat the base "like a deployed environment." The work schedule will be extended, and Airmen will work seven days per week to clear debris and get the base back online.

Ed. note: Commercial power was restored within a week of the storm. Additional coverage will appear in the next issue.



Fallen trees and flooding left most of Keesler's base housing unliveable. (photo by TSgt Jennifer C. Wallis)



Facilities at Keesler AFB received extensive damage from a direct hit on the base by Hurricane Katrina. (U.S. Air Force photo)



Like the commissary and other facilities, Keesler's thrift store was inundated by the storm surge. (U.S. Air Force photo)

This article was compiled from contributions from Mr. Louis A. Arana-Barradas, MSgt Orville Desjarlais, Ms. Lois Walsh, Ms. Sue Walsh, MSgt Michael A. Ward, and the 81st TRW Public Affairs office.

Providing a Roost for the Raptor

Langley AFB gets an “extreme makeover”

Mr. Mark O. Hunt
HQ ACC/A7DE

F/A-22 Raptor aircraft are arriving at Langley AFB, Va., and they're being welcomed to newly completed facilities.

The 1st Fighter Wing's 27th Fighter Squadron (FS) has accepted delivery of the first Raptors for use as combat-dedicated aircraft and will begin receiving two more each month to replace the F-15C Strike Eagles. The wing is scheduled to achieve initial operational capability Jan. 1, 2006. Full operational capability is slated for Jan. 1, 2008, after the delivery of a total of 78 aircraft, divided among the wing's three fighter squadrons.

The Raptor's combination of stealth, integrated avionics, maneuverability and supercruise (supersonic flight without afterburner) gives it “first-look, first-shot, first-kill” capability against any enemy aircraft and surface-to-air threats. Such an advanced weapon system demanded equally modern facilities.

- FY02—(\$40M) Now completed are a new airfield lighting vault, a base operations facility, and a low observable/composite repair facility, as well as a combined squadron operations/aircraft maintenance unit/hangar for the 27th FS (the first of three such facilities).
- FY03—(\$40M) Complete and operational are a flight line kitchen and flight simulator, and the second combined squadron operations/aircraft maintenance unit/hangar for the 71st FS, as well as west apron infrastructure improvements.
- FY04—(\$25M) Planned are a clear water rinse facility (completed May 2005), a vertical wing tank storage facility (complete October 2005), and the third combined squadron operations/aircraft maintenance unit/hangar for the 94th FS (complete October 2005).

Beddown Program Plans

Planning for the Raptor beddown began six years ago when a site survey team assessed existing facilities and infrastructure at Langley and identified needs for many new facilities and replacements for others. A bed-down program (FY02–05) was developed that included \$10.8M of operation and maintenance projects and \$105M of military construction (MILCON) projects. The plans for the first three years include:

Uncommon Facilities

Maintaining, training on, and operating this advanced fighter/attack aircraft required equally innovative, high-tech and sustainable facilities.

The low observable/composite repair facility has three maintenance bays: two dedicated to on-aircraft low-observable and composite material restoration and one used for either non-toxic aircraft structure maintenance or as a wash rack. Each bay produces laminar air flow across the entire airframe.



One of three new “roosts” for the F/A-22 Raptor at Langley AFB, which combine squadron operations, an aircraft maintenance unit, and a six-bay hangar. (photo by Mr. Mike McPheeters)

A background map of Langley Air Force Base showing various construction areas. Labels include: 'EAST APRON WITH EXISTING F-15 PARKING LAYOUT', 'CONSTRUCTION AREA (2004) PHASE I', 'SQUAD OPS/AMU HANGAR 755', 'ELECTRIC SUBSTATION', 'FIRE PROTECTION WATER RESERVOIR AND AFFF WASTE TANK', 'LOSS OF 45 POV SPACES', 'INFRASTRUCTURE CONSTRUCTION AREA PHASE I 778', 'POWER UPGRADE 2002 CONSTRUCTION AREA PHASE I (SHORT DURATION) 777', 'CONSTRUCTION AREA 2003 PHASE II', and 'CONSTRUCTION AREA 2004 PHASE II'. The map uses different colors to delineate these areas: purple for the hangar, red for the apron, and yellow for the power upgrade area.

The facility also has rooms for off-aircraft composite repair and classrooms for maintenance training.

The flight simulator building has four full-mission trainer simulators operating under controlled temperature, humidity and grounding conditions. “The F/A-22 Flight Simulator already provides exceptional training to 1st FW Raptor pilots with a capacity of 20 sorties a day,” said Lt Col Ron Babski, 1st Operations Support Squadron Commander. “By the time we get our full complement of F/A-22 aircraft, the simulator capability will [support] virtual large-force scenarios integrated with other ACC units.”

The squadron operations/aircraft maintenance unit/hangars each house a six-bay hangar, sized for any combination of F/A-22 and/or F-15 airframes, with the latest in high-expansion foam fire-suppression systems. The first floor houses all aircraft maintenance unit functions, and the second floor is occupied by the fighter squadron administrative offices; both spaces are on the flight line side, integral with the hangar. The three facilities were successfully executed as packaged multi-year contracts, assuring a proven single construction contractor, which eliminated site interference, minimized construction time and standardized the finished product.

“Our new operations/maintenance building is the best I have seen in the Air Force,” said Lt Col Jim Hecker, 27th FS commander.

Special Recognition

The Raptor beddown has been recognized for both its facilities and people. The design for the squadron operations/aircraft maintenance unit/hangars won the 2005 Honor Award for Facility Design in the Air Combat Command Design Award Competition; the low observable/composite repair facility design won the category’s Merit Award. The U.S. Army Corps of Engineers 2004 Project Delivery Team award was presented to representatives from the Norfolk District, HQ ACC and 1st CES for the F/A-22 beddown at Langley AFB.

Keys to Success

Proper attitude, direction and teamwork assured the delivery of facilities prior to the Wing’s initial operational capability date.

Attitude was affected by strong leadership from a senior executive review group, made up of senior leaders from the Systems Program Office, F/A-22 Integration Office, HQ ACC, 1st FW, 1st CES, and Norfolk District Corps of Engineers. The group periodically reviewed all aspects

of the beddown, providing strategic course correction along the way.

Direction was provided by ACC’s MILCON project execution metrics, which allowed a steady course throughout the planning, design, construction and turnover of the facilities. These metrics drove delivery of top-quality facilities, while minimizing cost and schedule growth.

Teamwork was the formula for getting so much done in so little time. Excellent working relationships were maintained between HQ ACC, 1st CES and Norfolk District project managers, and partnerships were created with the many construction contractors.

Lt Col Sheryl Hutchison, 1st FW F/A-22 Integration Office commander, recently said the new construction at Langley is “an effective balance between the unique heritage of this base and the future requirements of airpower. No matter where we deploy in the world with the Raptor, it’s comforting to know we’ll always have great facilities to come home to.”

Mr. Hunt is the chief of Design and Construction – East Branch, HQ ACC, Langley AFB, Va.

Ramping Up for AM-2's Replacement

Mr. Joe D. Fisher
ACC/A7XX

The search is on for the next generation of airfield matting, to give Air Force civil engineers a new capability to rapidly expand aircraft parking ramps and taxiways in a deployed environment.

Aluminum Matting 2 (AM-2) is currently used for rapid parking ramp expansion (RPRE). This medium-duty matting has been used since the Vietnam era (see sidebar, "History of AM-2"). While it's been effective, AM-2 has some drawbacks: it's heavy, cumbersome, slow to install, difficult to repair, and has very poor air-transportability characteristics.

Replacing AM-2 is Increment I of the three-phase RPRE development effort, sponsored by Headquarters Air Combat Command Installations and Mission Support Readiness Division (ACC/A7X). Increments II and III will focus on advanced soil stabilization and rapid pavement construction/repair materials, procedures and equipment.

The RPRE program objectives are twofold: replace existing AM-2 with a medium-duty airfield matting system that is lighter by 25-50% and half the size of a 463L pallet. This will reduce airlift requirements for deployment and make the matting easier to install, maintain and repair.

System Development and Demonstration (SDD) begins FY06, and will be executed by the Air Armament Center Agile Combat

Support Systems Squadron (ACSSS), Eglin AFB, Fla. The acquisition approach is to award contracts to two companies. Each of the two winning companies will provide its candidate matting systems. ACSSS will test and evaluate the systems for effectiveness, and then select one of these companies to conduct full-scale development of the new matting system. A production-representative system will undergo operational testing late FY08—early FY09, with initial procurement scheduled to begin in FY09.

Although the Air Force is spearheading the initiative to replace AM-2, including funding of the SDD, the project is very much a joint endeavor. The Army and Marines provided great support and are members of the RPRE integrated process team.

The RPRE program is based on years of effort by joint-service laboratories to identify and evaluate promising commercial technologies and materials. Teaming with the Army Engineer Research & Development Center and the Naval Air Engineering Station—Lakehurst, the Air Force Research Laboratory conducted many tests and evaluations of potential solutions. These efforts also supported the Army and Marine requirement for improved expedient helicopter launch and recovery surfaces.

This joint-service effort indicated that advanced composite materials and lighter-weight metal technologies now offer an

opportunity to develop a new family of lighter-weight airfield matting at an affordable cost and with the performance of AM-2, or better.

Building on these evaluations and recommendations, the Air Warfare

History of AM-2

AM-2 aluminum matting, an evolution of the pierced steel plank used in World War II, was originally developed for the U.S. Navy in 1961 and adopted by the Air Force in 1965. The individual panels measured 12' x 2' x 1 1/2" and weighed 144 lbs. The matting was designed for 2,000 to 3,000-foot runways and short-term (30-day) use on expeditionary airfields, but operational needs during the Vietnam War demanded a much longer life and more extensive use. For example, at Tuy Hoa AB, South Vietnam, the Air Force constructed a 9,000-foot AM-2 runway

that was used as the primary runway for a full five months and as the taxiway for the following two years. Civil engineers, especially RED HORSE units, laid and repaired AM-2 matting at nearly every USAF base in Southeast Asia. Later, it was used as the primary rapid runway repair material by engineers preparing for airfield attacks during the Cold War. Engineers laid the matting at bases throughout Southwest Asia during the Gulf War and Operations Enduring Freedom and Iraqi Freedom for taxiways, aircraft parking ramps and other uses.

— Dr. Ronald B. Hartzer, HQ AFCEA/CEBH

Battlelab designed and executed an initiative in FY04 to evaluate some of the most promising technologies and mat prototypes (see 'AM-X' Battle Lab Initiative). The Battle Lab's initiative provided an up-front assessment on several candidate systems, and gives the formal RPRE acquisition program a jump start in selecting the most suitable and effective RPRE system.

The RPRE effort has evolved from joint-service laboratory research and development to an in-the-field Battle Lab initiative, and now to a formal Air Force acquisition program. Once production begins, other services can



easily add to the Air Force procurement contract, and the new AM-2 replacement will become tomorrow's DoD standard for rapid aircraft parking ramp expansion.

AM-2 has had a long 'career' but the installation method hasn't changed.
(U.S. Air Force photo)

Mr. Fisher manages the ACC/A7 CE Modernization Program at Langley AFB, Va.

"AM-X" Battlelab Initiative

In April and June, the Air Warfare Battlelab (AWB) managed two operational demonstrations at Tyndall AFB, Fla., of six matting prototypes with the potential to be "AM-X—the next generation of airfield matting." Simulated F-15 gear load support tests were conducted in July. As part of the Rapid Parking Ramp Expansion (RPRE) Program to find a replacement for AM-2, AWB and Air Force Research Laboratory (AFRL) experts worked together to select the most promising materials and designs for testing and evaluation of the RPRE risk reduction phase.

Products selected for testing were made of lighter-weight metals or composites, designed with varying joining systems. At the April and June demonstrations, teams from Detachment 1, 823rd RED HORSE Squadron, were able to work

with the products at the Silver Flag training site. Crews removed, rebuilt, and weighed pallets and did time-trial, standard-size installations so AWB experts could measure installation rates to determine ease and efficiency of use; evaluate improved transportability through an increase in square feet of matting per aircraft pallet; and get experienced user feedback.

"I like working with the shorter sections," commented TSgt Mark Thomas of Det 1, 823rd RHS. "We're all probably biased to AM-2, but when you work with it a lot, its length is a problem; it gets heavy really fast."

The mission of the AWB is to rapidly identify and prove the worth of innovative ideas for enhancing the deployability, sustainability, survivability, and lethality of contingency Air Expeditionary Forces for Global Engagement. The AM-X initiative will not only support a portion of the USAF core competencies, but it will also help the CE warfighters' distinctive capability as it pertains to RPRE. Taking new and emerging technologies and conducting military utility demonstrations is what the AWB is all about.

— MSgt Joseph Pratt, AM-X Project Officer, AWB, Mountain Home AFB, Idaho.



Although this fiberglass mat is very light, Det 1 of the 823rd RHS discovered that the locking pins don't fit unless the panels are perfectly aligned. (photo by Mr. Guy Ivie)

Ensuring a Safe Landing

MSgt Mike Chapman
HQ AFCEA/CESC

Since Orville and Wilbur Wright's first flight in 1903, primary flight safety concerns have focused on aircraft mechanical failure and pilot error. However, two questions about the runway are equally important: Can the pavement support the weight of a given aircraft, and were adequate construction methods and equipment used to stabilize and compact underlying soils?

The U.S. military's reliance on airpower made determining the answers to these questions a priority and led to the creation in 1971 of the Airfield Pavements

Civil Engineering Center, now known as Headquarters Air Force Civil Engineer Support Agency.

The APE team specializes in determining structural strength of conventional paved and semi-prepared surfaces, and subsurface soil properties. The team also performs runway friction characteristic testing, pavement condition inspections, and power-check pad anchor testing. Team members spend six to eight months per year away from their home station, often in austere and dangerous locations.

The 12-member APE team is responsible for all required contingency and peacetime structural evaluations at nearly 200 Air Force installations around the globe. Due to increased operational requirements, other units spread throughout the Air Force—special tactics squadrons, global assessment teams, contingency response groups, and RED HORSE teams—also perform expedient evaluations, although they don't have the equipment to do detailed testing and data analysis.

The APE team primarily performs two types of structural airfield pavement evaluations: contingency and

routine. Combatant command-directed contingency evaluations are the main purpose for an active duty APE team. Three-person contingency teams use pavement coring equipment to determine the thickness and concrete flexural strength of the pavement layers and to provide access to the soil underneath the pavement. Teams then use manual and automated dynamic cone penetrometers to assess the strength and thickness of soil layers below the pavement. Data is analyzed using software developed by the U.S. Army Engineering Research and Development Center (ERDC) at Vicksburg, Miss.

Four-member APE teams also perform routine airfield pavement evaluations at main operating bases (MOB) worldwide, based on requests by Air Force major commands. MOB airfields routinely receive a structural evaluation every seven to ten years. These routine inspections usually employ a Dynatest heavy weight deflectionometer (HWD), a unique, trailer-mounted machine.

The HWD contains a 1,100-pound weight set to freefall from predetermined heights to simulate a 50,000-lb aircraft wheel load. Sensors on the HWD measure the

TSgt Jacob Sanabia takes transverse slope measurements, one of four parameters used to determine hydroplaning potential on runway surfaces.
(photos by Maj Ron Pieri)



Evaluation (APE) team at Wright-Patterson AFB, Ohio. In 1972, the team moved to Tyndall AFB, Fla., as part of the Air Force



deflection of the pavement and feed the data to a laptop computer, where Layered Elastic Evaluation Program software (another ERDC development) calculates pavement strength. This test helps engineers forecast potential pavement failures based on various aircraft types.

These technical evaluations are completed using the only non-destructive pavement testing equipment in the Air Force inventory. APE reports ensure that commanders have the necessary information to determine the sizes, types, gear configuration, and gross weights of aircraft that can safely operate on their installation's airfields. The teams also identify and predict major maintenance or repair requirements for an airfield and provide justification for major pavement restoration projects.

In the past two years, APE team members have performed evaluations at more than 80 different airfields on six continents. Many of those evaluations were performed at locations where U.S. Air Force aircraft had never operated, and in some cases only days after the airfield had been secured by coalition forces. Recently, APE teams evaluated airfields in Iraq to support expanded airlift



operations, significantly reducing the need for potentially dangerous convoy operations. APE team members also had the rare opportunity to evaluate snow- and ice-surfaced airfields in Antarctica. These airfields play a crucial role in support of international scientific missions on the continent and presented a unique challenge for evaluation personnel.

The next time you deploy, keep in mind that the runway you're landing on once had APE team "boots on the ground," so you can rest assured you're arriving on a structurally sound and safe airfield surface.

MSgt Mike Chapman is Superintendent, Airfield Pavements Evaluation Team, Tyndall AFB, Fla.

Top: This runway at the U.S. Air Force Academy in Colorado shows evidence of medium-severity longitudinal cracking. (U.S. Air Force photo)

Above: TSgt Calvin Carter, a member of the AFCEA APE team, marks a concrete core sample taken from the runway at Tyndall AFB, Fla. (photo by MSgt Michael A. Ward)

Kudos

The Airfield Pavements Evaluation Team recently won a 2005 Commander-in-Chief's Special Recognition Award for Installation Excellence. The presidential-level Special Recognition Award program recognizes units, teams, projects and individuals demonstrating exemplary achievement in the spirit of installation excellence.

Using the Best Approach

ACC Engineers Cut Costs with Innovative Contracting Method

Mr. Roger Williams
ACC/A7VS

The mission is clear: Find a better, more efficient way of cleaning up contaminated sites. Air Combat Command civil engineers are focused on cleaning contaminated sites consistent with future land use under a concept called Performance-Based Restoration (PBR) contracting. Tapping into knowledge already gained by environmental contractors, PBR is a better business model used by the command's CEs to protect human health and the environment through an

the Air Force maximum flexibility to find the best possible solutions.

Mr. Bob Barrett, ACC Environmental Chief, said, "Contracts will define the desired end state and the government receives a price certainty, but the PBR approach allows contractors to bring more innovative approaches for achieving the desired result." According to Mr. Barrett, contractor payment is based on meeting Air Force-

"Contracts will define the desired end state and the government receives a price certainty, but the PBR approach allows contractors to bring more innovative approaches for achieving the desired result."

aggressively active cleanup program. Rather than always going to the lowest bidder, contracts can be awarded to companies that offer the best value and skill sets for a particular environmental clean-up. This allows

determined discrete milestones, which are established around completion of distinct work elements. "Successful implementation by these contractors relies heavily on the company's experience, track record with past



Trenches were dug to install the biowall at Whiteman AFB. (photo courtesy CH2M Hill)

environmental clean-up projects and strong internal project management.”

“The PBR process helped us roll a number of remediation projects into a larger package awarded to one contractor with the necessary expertise,” said Mr. Marvin Eaves, 509th CES Restoration Chief at Whiteman AFB, Mo. “Our first remediation project was a huge success with 12 sites pending closure under Phase One, and we’re expecting 10

advantages. “This approach gives us a better way to reach remediation completion and gives the contractor the opportunity to apply the necessary technologies and strategies to get the job done to performance standards. PBR provides common ground for the various government agencies involved in a remediation project to achieve success.”

Historically, Air Force remediation projects have been conducted in phases and have



*L: Organic mulch and sand from the Base Recycling Center were used to create the biowall at Whiteman AFB.
R: After installation, the biowall was hardly noticeable.
(photos courtesy CH2M Hill)*

more sites to be closed under Phase Two of the PBR project.” The Air Force Center for Environmental Excellence is the service agency for Whiteman’s PBR project.

At one of the PBR remediation sites, where groundwater was contaminated with trichloroethylene (TCE), Whiteman spent \$100,000 to create a biowall made of recyclable materials found on base. To prevent TCE-contaminated groundwater from entering a nearby stream, a remediation firm would normally create a special clay-lined barrier at a cost of up to \$1M. Instead, engineers used organic mulch and sand from the Base Recycling Center for the less expensive biowall. Later this year, Mr. Eaves and the crew at Whiteman will speak about this inexpensive technological solution at Battelle Science and Technology International, as well as at universities across the United States.

Mr. Shawn Holsinger, ACC’s Environmental Restoration Chief, has been involved with performance-based contracting with the Army and at ACC, and he sees definite

taken an average of 10 or more years to complete. Congress and state and local governments are demanding quicker and less expensive clean-up of federal lands; change was definitely needed. Private industry has used the PBR approach for nearly a decade, with individual remediation contractors bringing new approaches to clean-up projects. “In fact, based on their experiences, they are confident enough to assume a level of the financial risk and liability in many cases,” said Mr. Holsinger.

Whiteman’s PBR project has been turned around much more quickly than similar projects. Mr. Holsinger points with pride to the recent successes in this “not-so-typical business as usual” installation-wide contracting project. “PBR results in a 30% cost savings and a 20% time savings at ACC bases.”

At Whiteman AFB, the \$100,000 cost of this project for the \$1M of remediation benefit is definitely a good return on investment.

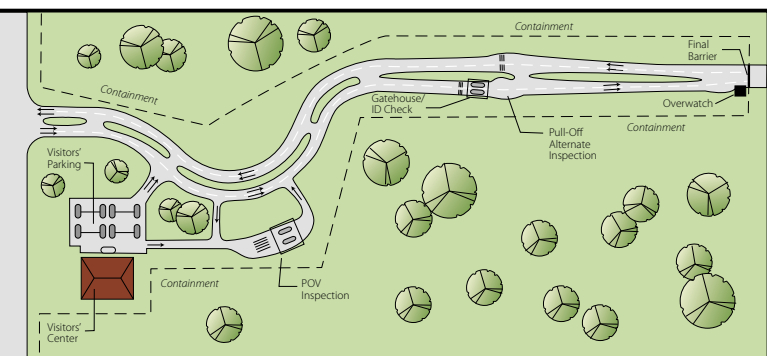
Mr. Williams works in Environmental Media Relations at HQ ACC, Langley AFB, Va.

These Gates Don't Stand Ajar

AMC civil engineers help security forces stand tall & proud at new gates

MSgt Paul Fazzini
AMC/PA

The dust is beginning to settle at bases across Air Mobility Command. In less than two years, more than 100 projects at 29 base entry gates across the command's 12 installations are nearing completion and, according to officials, the command-wide program is setting the standard for the Air Force.



This conceptual site plan can be adapted to each base's specific terrain. (diagram courtesy AMC)

"Air Mobility Command has taken installation access control to a new level," said Brig Gen Del Eulberg, AMC Installations

and Mission Support (AMC/A7) director. "Our command-wide gate construction program has provided the platform for employing the latest in security technologies and techniques while providing visitors a great first impression of our installations."

The need for such an extensive construction program resulted from the Sept. 11, 2001, terrorist attacks, when the Air Force director of plans and programs directed that the force protection condition at every stateside Air Force base be increased to a level that included a 100 percent identification check as well as a variety of other measures necessary to control access.

According to MSgt Donald Barbiea of AMC/A7's Entry Control Point Construction Branch, AMC chartered cross-functional force protection sustainment (FPS) teams to visit the 12 bases and assess the long-term impact of the force protection measures.

"The teams' combined report detailed force protection lessons learned and best practices and provided recommendations to AMC leaders about the facilities, manpower, and

equipment necessary to implement those best practices," he said. "When implemented, our installations will meet or exceed Department of Defense and Air Force directives to maintain secure operations."

Because some of the report's recommendations were not immediately affordable, AMC officials adopted a "perimeter first" approach to providing base security, the first in a three-step strategy designed to detect, deter and defeat potential threats to the base.

The first major objective the FPS teams' report identified was installation traffic management, as well as the series of events necessary to effectively process vehicles on to the base. To help with this challenge, the Surface Deployment and Distribution Command Engineering Agency at U.S. Transportation Command was brought on board to provide guidance. A team of members from the agency and the AMC staff visited each AMC base to conduct traffic assessments, which were used to make recommendations for layout and design of the new gates.

Throughout the assessment process, the A7 staff developed antiterrorism force protection standards that were used to create a new AMC design guide for installation entry control facilities.

"When we began looking at the force protection guidance we used to secure our bases, we realized it was based upon a post Cold War-era security forces concept of operations," said Mr. Joe Markin, chief of the command's antiterrorism program. "With the emphasis on detecting, defending and defeating terrorists, we realized we could no longer do business with an entry control point defined as a gate, a guard and a gun."

MSgt Barbiea said civil engineer and security forces determined that the entry control process required a series of facilities with

clearly separate and distinct operations. The assessment and review process identified six areas of concern: traffic management and vehicle queuing prior to base entry; screening of visitors; inspection of vehicles; security forces identification check stations; distance between ID check stations and final barrier; and an overwatch station with final denial barrier.

AMC officials provided the findings to the Air Force plans and programs director, who eventually approved the one-of-a-kind, \$89M Air Force program and gave the go-ahead to seek contractors for the gate construction. AMC's work on this project was the foundation for development of the *AF Entry Control Facility Design Guide*, published in February 2003. DoD adopted these criteria and published them in May 2005 as UFC 4-022-01, *Security Engineering: Entry Control Facilities/Access Control Points*.

The command-wide gate construction program began at the end of FY03; completion is expected in FY06. To execute this critical program, the Air Force partnered with Parsons-Evergreene, Inc., in a design-build contract.

"This project was especially challenging because each gate at each installation was a unique design and required temporary entrances during construction. Our design standards were very high, and we had many challenges during construction, but the finished product is first class. It

was a great team effort from start to finish," said Brig Gen Eulberg.

The AMC Design Center worked with each base to develop its individual gate facilities within an architectural compatibility plan that was unique to that base. "The designs fit each installation and meet the force protection needs of our Airmen, one of which is adequate lighting necessary to clearly detect potential threats," said Mr. Markin.

Besides improving the appearance, facilities and force protection, the new program also enables implementation of emerging technologies, including Smart Gate entry control technologies, surveillance cameras, visitor check-in kiosks and vehicle scanning technology.

"Because of this undertaking, the program has changed the face and the entry process of AMC bases for years to come," said Brig Gen Eulberg. "Our base communities are safer and more secure, and the new facilities provide a better working environment for our dedicated security forces personnel."

The new main gate, first of three gates being built at McCord AFB, has improved force protection features.
(photo by Ms. Kristin Royalty)



Bye-Bye, Tent City

MSgt Michael A. Ward
380th AEW/PA

Airman deployed to the 380th Air Expeditionary Wing (at an undisclosed location in Southwest Asia) will soon get an upgrade to their living conditions.

A new living area, under construction and due to be completed next year, will have dorms and semi-permanent structures instead of tents. Called the temporary cantonment area or TCA, it's a stop-gap measure until a permanent living and working area is completed by the host nation in 2008.

"We've been coming to this base for more than a decade and some of these tents are that old," said Maj Brian Benter, chief of engineering for the 380th Expeditionary Civil Engineer Squadron. "It's a high priority to get us out of tents as fast as possible and into more durable facilities."

The move is being driven in part by new force protection requirements that call for living and working areas to be established further away from base perimeter fence lines. The current cantonment area does not meet those requirements.

Construction on the TCA began in summer 2004 on what was originally a dump site on the flight line side of the host nation's air base. The site was cleaned up by the host nation and new fill was brought in. When the TCA is completed, all operations and living spaces for the 380th AEW will be relocated there.

Some of the buildings on the current site will be moved to the new location, but most of the facilities are being built from the ground up. And that means no tents.

"I think it's really exciting," said Maj Benter. "We're basically building a town, and next year people will be moving into new facilities with new furniture. That will make deployments here much better."

The cantonment area will have a headquarters building, four dormitories, fourteen

two-story trailers, a dining hall and other facilities.

The project was originally scheduled for completion this year, but Maj Benter said that progress has been slower than expected. "That's not necessarily a bad thing. It's a real tight area, so even though we could do it faster, that would mean a big influx of contractors in the same area competing over real estate in order to get their projects done on time."

The United States is providing nearly \$15M in military construction funds and \$15M in operation and maintenance funds. The host nation has already funded around \$7M for security improvements including the vehicle search area, and is funding approximately \$7M more for utilities since the TCA is in an undeveloped portion of the base.

The host nation is also providing the entire \$70M to build a permanent U.S. cantonment area next to the temporary one. The permanent cantonment area is due for completion in about 2008.

By then, tents will be a long-forgotten part of the 380th AEW's past.



Contract workers build a perimeter fence for a new temporary cantonment area for the 380th Air Expeditionary Wing in Southwest Asia. (photo by Mr. Jerry Shumate)

Keeping the Water Flowing

Water. It's one of life's most basic necessities. Without it, battles have been lost and entire armies have fallen.

It can mean the difference between success and failure—and even life and death.

The Airmen of the 447th Expeditionary Civil Engineer Squadron utilities team know that getting clean water to the troops and safely disposing of wastewater is one of the cornerstones of military operations.

"The first two priorities in establishing deployed operations are getting a runway open and getting water service established," said TSgt Thomas Weis, leader of the nine-person team, all deployed from the 18th CES at Kadena AB, Japan. "We're plumbers. We work to keep clean water flowing in and dirty water flowing out—it's just that simple."

Although it is often back-breaking, filthy, smelly work that goes mostly unnoticed by others, the utilities team members find their reward in going unnoticed.

"No one flushes a toilet or turns on a shower and jumps for joy," SrA Steven Wright said. "It's just something that's expected, and necessary, to keep the force strong."

Although the concept may be simple, achieving that goal takes a coordinated effort.

The plumbers keep more than 120,000 gallons of water on hand and every morning make trip after trip to keep the more than 30 water tanks around the base filled. In one week, the team delivers nearly 30,000 gallons.

One entire section of the base relied exclusively on the water truck deliveries, but TSgt Weis's team has been slowly but surely installing more than 5,000 feet of pipe across the rocky ground and roadways of the base. Once completed, the project will provide clean water directly to a 5,500-gallon

holding tank, keeping a constant supply on-hand for more than 20 base facilities.

"When we leave here, I want everyone to have a steady, reliable and safe supply of water," TSgt Weis said. "Without it, people can't focus on their mission, and that could lead to mission failure."

Pumping in clean water is only half of the equation. While filling water tanks and running new water lines is hot and dirty work, disposing of waste water can get just plain nasty.

"Sewage is definitely something that people don't want to think about, but waste from the sinks, showers and latrines has to go somewhere," SSgt Sam McCray said. "We have also been improving the wastewater system, and the job can get pretty nasty sometimes."

Recently, the utilities Airmen installed a new lift station and wastewater pipe into a more secure part of the base. The lift station moves wastewater to a series of central holding tanks, where it can be pumped out and trucked to treatment facilities. Once the new lines were installed, SSgt McCray removed the old waste lines.

The utilities Airmen quietly go about their mission—keeping fresh water flowing in, and wastewater flowing out, and they do not care much for being in the limelight.

"My people get the job done, no matter what it takes," TSgt Weis said. "As long as people don't have to think about us, we know our mission is successful."

TSgt Brian Davidson
447th AEG/PA



A1C Juan Rodriguez, part of the 447th ECEC plumbing crew, fills a fresh water tank in Baghdad. He's deployed from Kadena AB, Japan. (photo by TSgt Brian Davidson)

Airmen Contain Fire on Joint Installation

TSgt Melissa Phillips
407th AEG/PA

Firefighters with the 407th Expeditionary Civil Engineer Squadron contained a fire on the Army side of Ali Base, Iraq, Aug. 15, only hours after they assumed fire protection coverage there and for Base Camp Adder.



407th ECES firefighters responded to this trailer fire just hours after taking on fire protection responsibility for the entire post. (U.S. Air Force photo)

“We saved most of the trailer and kept it from starting a fire in other trailers that are pretty close together,” said SrA Chad Noyes, a 407th ECES firefighter deployed from the North Dakota Air National Guard.

The 407th ECES fire protection previously covered only the flight line and some joint-response buildings like the dining facility and post exchange.

Now the Airmen provide fire protection for 8,000 U.S. servicemembers and coalition forces housed at Base Camp Adder, not just the 1,100 Airmen at Ali Base. To cover the larger area, Air Force firefighters relocated from nearby Camp Cedar with their vehicles and equipment.

The 407th ECES took over the duties as a cost-effective measure for the military and because it made more logistical sense.

“The Air Force receives special training on flight line fires because of the unique metals and alloys found in aircraft fires,” said SMSgt Michael Brown, 407th ECES deputy fire chief. The materials react differently to fire and require special handling procedures.

During a common structural fire, firefighters are taught to sweep the base of the fire to extinguish it. On aircraft fires, they use foam and rain it down on the top of the fire to create a seal over any potential gasoline leaks and starve the fire from oxygen, SMSgt Brown said. Grouping people together with similar training backgrounds lessens the likelihood of miscommunications, which can cause precious minutes to tick away.

Previously, Airmen and the contractors shared joint-response capabilities on four facilities, but their equipment was not interchangeable, and their styles and protocols were slightly different, especially on one critical detail.

Before the efforts of a few servicemembers during this rotation, the Army side did not have a 911 system and was required to use a longer telephone number.

“It took a lot of doing to get that done,” said SMSgt Brown, who is deployed from the Nevada Air National Guard. “It’s important because it reduces the response time from the initiation of any incident.”

Just a couple of days before the fire, the crew watched a training video on trailer fires.

“The training gets everyone’s attention because we have to rely on the information if it ever does happen,” SrA Noyes said. “It drives home the point that you always have to be prepared, and the training quickens our response time.”

There were no injuries from the fire, and the cause is under investigation.

Meeting the Safety Challenge

Electrical safety is a top priority in the 78th Civil Engineer Squadron, Robins AFB, Ga. Col Lemoyne Blackshear, 78th CEG commander, wasted no time in ensuring that electrical workers know how to comply with recent Air Force electrical safety guidance for working on or near energized electrical equipment.

In 2004, the electrical career field experienced nine on-duty mishaps. Seven of them occurred when electricians, both military and civilian, were working on energized equipment. In late 2004, Maj Gen L. Dean Fox, The Air Force Civil Engineer, established a new electrical safety policy consistent with the 2004 National Fire Protection Association (NFPA) 70-E, *Standard for Electrical Safety in the Workplace*.

To implement the new requirements, Col Blackshear's electrical superintendent, Mr. William Fowler, worked closely with the Air Force Civil Engineer Support Agency (AFCESA) to develop new energized work procedures, permit/authorization documentation, and personal protective equipment (PPE) selection procedures appropriate for tasks outlined in AFI 32-1064, *Electrical Safe Practices*; Engineering Technical Letter (ETL) 04-15, *Electrical Safety Guidance*; Unified Facilities Criteria (UFC) 3-560-02, *Electrical Safety*; and NFPA 70-E.

The most significant part of the new guidance is accomplishing an arc flash hazard analysis and a flash boundary determination in order to select the appropriate PPE. In the past, a task such as operating a high-voltage switch required the use of "hot" sticks with rubber gloves; the current guidelines require a full protective, flame-resistant suit.

Mr. Fowler says complying with the new requirements has been challenging, but he feels the changes are good ones and will help prevent injury if an arcing short circuit occurs. He mentioned that having

AFCESA available to help choose appropriate PPE from the myriad vendors has been invaluable.

Transition to new NFPA 70-E safety requirements has been challenging to many base electrical shops because it's a new way of doing business. However, the 78th CES has met the challenges head-on with a positive and safety-compliant attitude. They do things the right way—saving lives while getting the job done.

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

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



Mr. Bobby Rhodes and Mr. Billy Bandy, electricians with the 78th CES, use the appropriate PPE to work on high-voltage switchgear. (photo by Mr. William Fowler)

Right-Sizing the Alaska Radar System

Capt Travis H. Monson
611 CES/CECP

In the remote regions of “The Last Frontier,” Eleventh Air Force, through the 611th Air Support Group (ASG) at Elmendorf AFB, operates and maintains a network of radar sites that make up the Alaska Radar System (ARS). The ARS allows the 611th ASG to act as North America’s sentinels, providing the U.S. Air Force, North American Aerospace Defense Command, and Federal Aviation Administration with radar surveillance, communications, and infrastructure for homeland defense.



Barter Island Long-Range Radar Site's current configuration is too large for today's needs. (photo courtesy 611th CES)

The ARS currently comprises 17 active radar sites and 19 inactive sites spread out over 590,000 square miles. Facilities at ARS sites are either vacant or improperly sized, as well as run down. Designed and built in the 1950s, most of the facilities were sized for 100-200 personnel at the height of the Cold War. Since then, radar communications technology has greatly advanced and manning is drastically lower. Currently, three of the active sites are unmanned because they're fully automated. The remaining active sites are operated and maintained with minimal staffing by contrac-

tors; each site has 1-5 full-time resident personnel and, at times, 10-15 temporary personnel for repairs and special projects. Funds for sustainment, restoration, and modernization (S/R&M) of the facilities are insufficient; utility costs for the active sites are burdensome.

According to Colonel Steve Armstrong, recently commander of the 611th Air Support Group, “We began to develop a right-sizing strategy to ensure the viability of the ARS for the next 25 years. This strategy will significantly reduce the S/R&M requirement and utilities costs and achieve our overarching goal to correct discrepancies between original site design and current usage.”

Since right-sizing the ARS is a major undertaking, the 611th Civil Engineer Squadron (CES) developed a phased approach to correct discrepancies. In the initial phase (already completed), the 17 active radar sites were divided (by configuration) into three categories: unmanned, split camp, or composite. Split camps have two parts: the radome (radar dome) is in the top camp on the mountain, and the other facilities are in the bottom camp. Trams or roads connect the camps. Composite sites have all the facilities at one location (see photo at left). Although camps in the unmanned category are composite in layout, they are grouped in a separate category because they have no permanent party personnel and are fully automated. In addition, the unmanned camps have a different type of radar system than the split camp and composite sites.

For each of the three types of sites, the 611th CES in conjunction with an engineering design firm developed baseline models based upon anticipated needs and requirement guidelines for general site and facility sizing. For example, the 611th CES determined the amount of storage space necessary for each site per AF guidance and current manning levels. With AF guidance as a starting point,

Elmendorf CEs work to make ARS fit tomorrow's needs

each site's requirements were analyzed and modified (as necessary) to more adequately correspond to the current situation. Some types of sites required more storage than others, so the models were developed based upon site configuration. The work performed in this phase garnered the American Planning Association's highest award, the Outstanding Federal Project Award from the association's Federal Planners Division.

As part of the second phase, the 611th CES again in conjunction with the design firm visited eight of the ARS sites and applied the first-phase models to each to determine the specific size each site needed to be to support the ARS mission. Once the site's facility requirements were known, they performed a cost-comparison analysis to decide the best option to meet the requirements. These options included maintaining the status quo; repairing, right-sizing, or demolishing existing facilities; and constructing new facilities.

The final product of the second phases is a Customer Concept Document (CCD) that the design firm created for each site. The CCD included a 10% site design with complete programming packages and a single-sheet, executive summary marketing

brochure. The design firm will also develop recommendations for a prioritized project list for the ARS. This prioritized list will take into consideration factors such as which ARS site should be right-sized first as well as which actions need to be performed first at each site.

When construction finally begins, several factors will impact the project. Because the construction season is short, normal construction techniques cannot be used. Some of the design concepts include pre-engineered units that can be assembled on the site to minimize construction time and costs.

Mobilization will be a significant portion of the project cost due to the remote nature of the sites. Most can only be reached by barge in the summer or by airlift onto a short gravel airstrip. Man camps will have to be brought in to house the construction crews.

"The final outcome envisioned is an Alaska Radar System that will effectively and efficiently meet the mission needs for the next 25 to 30 years," concluded Colonel Armstrong.

Capt Monson is Chief of Programming, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska.



The overlays on this photo indicate the work recommended to right-size Barter Island LRRS. (diagram courtesy 611th CES)

RED HORSE Rides to Keesler

Combat engineers capable of rapid deployment into war zones are proving to be effective first responders in bringing aid to areas devastated by Hurricane Katrina.

1Lt Nathan D. Broshear
505th CCW/PA

Airmen with the 823rd RED HORSE Squadron, Hurlburt Field, Fla., left early Aug. 30, bound for Keesler AFB, Miss., one of the worst-hit areas in deadly Hurricane Katrina's wake.

"RED HORSE teams are 'deploying' as we speak to Keesler ... to bring vital aid to our fellow Airmen," said Col Jim Lyon, 823rd RHS commander. "Our mission is to bring supplies, remove debris and provide safe shelters in conditions that can only be described as complete devastation."

Rescue and relief operations are proving to be challenging as each wave of Airmen encounters new problems. The first team of RED HORSE combat engineers assessed damage and aligned supplies while cutting their way to the base.

Airmen with the 823rd RHS prepare an emergency airfield lighting system for deployment to Keesler AFB, Miss. (photo by A1C Chris Bautista)

"It's hard to imagine, but our people had to literally chainsaw their route to the base," Col Lyon said. "For many paths, they were the first to clear roadways—they made it possible for others to get aid to Keesler."

"Coordinating with local law enforcement and military officials is another tough task, as telephone and communications are gone," the colonel said.

Because RED HORSE Airmen are used to deploying to austere locations, their convoys are "armed" with all the equipment they might need to complete their mission. Gasoline, shelter, water and food must all be brought in with each wave of manpower.

So far, about 100 823rd RHS Airmen have left for disaster relief operations. On Aug. 31, Airmen at Hurlburt were still busy loading an emergency airfield lighting system while they waited for the chance to do their part.

SSgt T.J. Manns, an electrical journeyman with the 823rd RHS, is realistic about what his follow-on team might encounter. "You can try to mentally and physically prepare yourself for what you'll see, but I don't think you're ever fully prepared for something like this," he said.

"Our friends are homeless right now," SSgt Manns said. "Our job is to help them get back to normal. I want them to know the legendary 823rd RED HORSE is on the way, and we're going to do everything we can to get them back into a home."



CEs Use “Dominator” for Rescue

Noah’s Ark came to Keesler disguised as a big, blue vacuum truck during Hurricane Katrina.

While preparing for the Aug. 29 storm, Keesler’s 81st Civil Engineer Squadron loaded the tank of the “Dominator” with water for ballast so the truck wouldn’t be swept away by the anticipated flood waters. The crew never expected to use the huge vehicle to rescue both the base’s water system and two of its team members.

At the height of the storm, the 81st CES operations flight had to ensure the integrity of the base’s water supply, including the emergency generators that were running the pumps and wells.

“I was really worried about sending anyone out into the rising waters and intensifying winds,” said flight commander Maj Jeff Szatanek. “But our guys had a job to do and they hit the ground running.”

Mr. Al Watkins, the base’s utilities manager, and MSgt Lonnie Bacon, noncommissioned officer in charge of electrical infrastructure, jumped into the Dominator to make the rounds and stabilize the water system.

MSgt Bacon, who’s experienced his share of hurricanes while growing up in Florida, was alarmed at the rapidly rising waters that skimmed the cab of the high-profile vehicle.

“The base looked like an ocean,” said Mr. Watkins, who explained that the storm surge pushed the flood waters up to 6 feet in many locations. “The water was lapping up to the yellow stripe at the top of the ball field fence.”

Mr. Watkins and MSgt Bacon had just returned to the 81st CES compound after making their rounds when a call came in that Mr. Dean Payne and Mr. James Bitton, two of

the squadron’s boiler operators, were trapped by rising waters at Keesler Medical Center.

Mr. Watkins and infrastructure manager Mr. Stanley Morgan grabbed a camcorder and digital camera to document the destruction as they jumped into the Dominator to retrieve their teammates.

“It was unreal how far the surge water reached and how fast it rose—I’ve never seen anything like it,” said Mr. Morgan, who was working his fourth major storm since coming to Keesler.

The steam plant was crumbling as the Dominator plowed through the water at the north side of the medical center, and Mr. Payne and Mr. Bitton had sought refuge in personal vehicles.

Mr. Watkins positioned the truck to stem the impact of the wind and water. Mr. Morgan couldn’t force the door open from inside the cab, so he rolled down the window to open the door from the outside. The door’s metal frame buckled from the force of the flood surge as they pulled their co-workers into the two-person cab with them for a snug ride back to the compound.

“We weren’t scared—the adrenaline really kicks in when you have a job to do and you know people are counting on you to get it done,” Mr. Watkins stressed.

“In my book, these guys are heroes among heroes,” Maj Szatanek pointed out. “The guys at the medical center made a heroic effort to keep the steam plant operating, and Mr. Watkins and Mr. Morgan were true heroes in risking their own lives to save other members of our team.”

Ms. Susan Griggs
81st TW/PA

The Honorable Nelson Gibbs Retires

Col Michael Smietana
AF/ILEH

June 17, 2005, marked the retirement of The Honorable Nelson F. Gibbs, a strong supporter of civil engineers around the world. Mr. Gibbs, the first-ever Assistant Secretary of the Air Force for Installations, Environment and Logistics, retired in a ceremony at Bolling AFB, D.C.

Mr. Gibbs' retirement culminated a distinguished career in public service and private industry. He served as an Army civil engineer in the early 1960s. From 1999 until 2001, he worked at the Office of Management and Budget, serving as Executive Director of the Cost Accounting Standards Board.



Mr Gibbs (L), Lt Gen Walter E. Buchanan III, Commander, USCENTAF, and other leaders at Manas AB, Kyrgyzstan, discuss field conditions for the troops.
(U.S. Air Force photo)

In summer 2001, the Air Force Secretariat reorganized, establishing SAF/IE. Mr. Gibbs was chosen to run the new organization, where he led a significant transformation in the way the Air Force manages installation and environmental issues.

One of the largest efforts Mr. Gibbs led was the recent Air Force Base

Realignment and Closure (BRAC) process. "This BRAC was the greatest transformational opportunity the Air Force has had in many years," he commented. "From consolidating Guard and Reserve components, to creating joint installations with the Army and Navy, the Air Force will become more effective and efficient."

Mr. Gibbs was also crucial in defending civil engineer programs over the past four years. "By establishing sound, responsible investment policy based on facility recapitalization and plant replacement value, we've been able to successfully advocate for MILCON and

S/R&M funding," he stated. "We have to keep in mind that while facility investment is championed by Air Force civil engineers, ultimately it's the warfighter who benefits by training and fighting from properly maintained air platforms."

During Mr. Gibbs tenure, the housing privatization program also matured. When he arrived, there was one privatized housing project in the Air Force. He challenged Air Force engineers with a goal of privatizing 60% of the housing inventory by FY07. "Housing privatization improves our inventory much faster than traditional methods," he said. "It took awhile to take root, but it now has, and privatization is actually being pursued at bases where it was initially thought of as unfeasible." As Mr. Gibbs departs, the Air Force will have privatized over 16,000 units.

During his four years as Assistant Secretary, Mr. Gibbs visited nearly every Air Force installation. He said what he will cherish most is his relationship with Air Force civil engineers in the field and at the major command level. "Engineers execute from our bases and major commands, not in the Pentagon. Our next challenge is to be even more expeditionary than we are now, to better support the warfighter. Air Force engineers have to adapt to the changing needs of the military—which we are doing. I am certain that the civil engineer career field is in good hands."

Mr. Gibbs plans to spend his retirement back home in Los Angeles, Calif. He will always be an honorary Air Force civil engineer.

Mr. William Anderson, an executive at General Electric, has been nominated by the president to succeed Mr. Gibbs. As of the date of this article, his appointment has yet to be confirmed by Congress.

Col Smietana, formerly Mr. Gibbs' senior military assistant, is chief of the Housing Division in the office of The Air Force Civil Engineer.

Firefighter Named One of Air Force's Outstanding Airmen

A 16th Civil Engineer Squadron firefighter earned the prestigious honor of being named one of the Air Force's 12 Outstanding Airman of the Year for 2005.

Col O.G. Mannon, 16th Special Operations Wing commander, Hurlburt Field, Fla., surprised SrA Amber Turek with the good news June 15 at a short-notice "safety brief."

"This is one of the greatest things that has ever happened to me," SrA Turek said. "I have always tried to come to work with a positive attitude and give 100%, but I really owe my success to the other firefighters I work with."

According to her nomination package, SrA Turek provided unmatched rescue crew emergency services to base members at Hurlburt Field and Misawa AB, Japan. She personally responded to more than 100 calls, while protecting \$4.2 billion in Air Force assets.

"Every member of the fire department would trust her with their lives. She can handle any situation we might face," said Mr. Aaron Grindland, 16th CES rescue crew chief.

Her accomplishments are many. While assigned to Misawa, SrA Turek was credited with personally saving two lives. In responding to a vehicle accident, her quick thinking and application of medical treatment saved a seriously injured passenger's life. In responding to a comatose victim, her quick evaluation and treatment not only saved the individual's life, but prevented any long-term health problems. SrA Turek was also part of a Misawa response team that quickly contained a fire and prevented catastrophic loss of a family housing unit valued at over \$100,000.

While at Hurlburt, SrA Turek expertly led firefighting efforts during a major gas leak, in which 100 members were evacuated. Off-duty, she participated in annual Fire Prevention Week activities, speaking to almost 200 schoolchildren about fire safety.

During a four-month deployment, SrA Turek helped conduct operations at a firehouse that provided fire and rescue emergency services for more than 2,000 coalition warfighters. She responded to more than 140 emergencies, helping to ensure no loss of life or coalition assets.

Her fellow firefighters have enjoyed razzing SrA Turek about her award. She said that the deputy fire chief has jokingly offered her some grease to squeeze her head through the firehouse doors, but it's all in good fun because fellow firefighters lauded her achievement without hesitation.

"Everything I have accomplished has been as part of the firefighter team," said the Chicago native, who joined the Air Force to become a firefighter.

**By MSgt Kevin Owen
16th SOW/PA**



photo by MSgt Stuart Camp

FDNY Promotes Deployed Firefighter

TSgt Melissa Phillips
407th AEG/PA

It isn't every Airman that enjoys the distinction of being addressed as both a staff sergeant and a lieutenant.

SSgt Gregg Magi, a 407th Expeditionary Civil Engineer Squadron firefighter, was promoted to the rank of lieutenant in the New York City Fire Department (FDNY) via telephone during an Aug. 16 ceremony in New York.

"It feels good to be promoted," said SSgt Magi, who is deployed from the New York Air National Guard's 105th Airlift Wing. "I've always wanted to be involved in public service."

During the ceremony, he and two of his co-workers crowded around a telephone to listen as the events unfolded. When SSgt Magi's name was called and the crowd was informed he was serving in Iraq, thunderous applause echoed over the line.

"It was humbling to hear the applause," he said. "I just want to thank all the FDNY firefighters who have showed me their support."

MSgt Charles Burke, assistant fire chief for the 407th ECES, surprised SSgt Magi with the news of his promotion earlier in the day. However, SSgt Magi still wasn't aware he would take the oath over the telephone until it occurred. He had assumed he'd have to wait until the next class.

"It couldn't have happened to a nicer guy," MSgt Burke said. "He studied for it, and if anyone's ready for the responsibility, it's him."

No stranger to hard work, SSgt Magi studied 5,000 pages of material to achieve his new rank. As a lieutenant, he will supervise a four- to five-person firefighting crew and ensure his crewmembers' safety on scene.

"There are more than 100 New York City firefighters that I know of deployed in the Southwest Asia area of responsibility," SSgt Magi said.

"They all deserve the same amount of recognition."

SSgt Magi, a fulltime firefighter with Squad 18, Special Operations Command, was one of 27 firefighters promoted at the ceremony.

Based in Manhattan, his unit is known for high-angle/technical rescue and high-rise firefighting in New York's many skyscrapers. His unit also performs rescue operations.

He was working on Sept. 11, 2001. Instead of immediately going to the Twin Towers, his former unit, Engine Company 82, covered the territory of another engine company that had already responded to Ground Zero. Engine Company 82 didn't get there until after the towers collapsed. The lieutenant from the other company perished inside the wreckage.

SSgt Magi said he will never forget that. It's one of the reasons he enlisted in the military and volunteered to come to Iraq.

"I'm glad to have the opportunity to serve in the war on terrorism," SSgt Magi said. "I wanted to step up and do something positive for the memory of the (people) we lost and their families who were affected."

Three hundred and forty-three firefighters died trying to rescue victims of the attack.



U.S. Air Force photo

CEs Bring Light in the Night

In the small village of Red Devil, Alaska, 287 miles west of Anchorage, air travel is the sole means to enter and leave the town.

The 4,750-foot gravel airstrip lined with orange cones is essentially the town's lifeline to the rest of the state. This lifeline has been significantly strengthened through the purchase and installation of a runway lighting system.

Red Devil qualified for the portable system through the Rural Alaska Lighting Program because its airstrip was inadequate for nighttime use. Airmen from the 611th Civil Engineer Squadron at Elmendorf AFB, Alaska, installed the system and got it glowing.

"Many small villages don't have roads out of town, so if someone gets injured they're stuck," said Carl Siebe, the Alaska Department of Transportation acting deputy commissioner of aviation. "Once the system is in place, the lighting kit will allow an aircraft to land at night... and take [an injured] person [to] medical attention."

The deployment of the system took place Aug. 17 as part of Alaska Shield-Northern

Edge 05, the largest homeland defense/homeland security exercise conducted in Alaska. For the purpose of the exercise, the real-world lighting system deployment was enacted as part of an exercise scenario in which Juneau's runway lights were damaged by an earthquake.

Approximately 40 minutes after offloading the system from a Black Hawk helicopter, the four-person CES team distributed the 40 lights around the runway. Even in the middle of the day, it was easy to see how useful the system would be during night hours as green lights glowed around the airstrip.

"It's a totally new environment for everyone involved," said TSgt Gregory Eckroth, 611th CES. "The training is more realistic when dealing with transporting and setting up the system in a remote location."

The residents of Red Devil are thankful to have the new system. "Red Devil doesn't have a clinic, so...we will have a more restful feeling knowing night operations are possible," said Theodore Gordon, tribal administrator of the Red Devil traditional council. "We are extremely grateful to the military."

USCG PO3 Gail E. Dale
Alaska Shield-Northern Edge
Public Affairs

Key Personnel Changes

Col Timothy A. Byers became The Civil Engineer, Headquarters Air Combat Command, Langley AFB, Va., on September 5, replacing Brig Gen Patrick A. Burns, who retired October 1.

Col William M. Corson is now The Civil Engineer, Headquarters Pacific Air Forces, Hickam AFB, Hawaii, replacing Col Byers.

Col Mark Pohlmeier is now Chief, Programs Division, Office of The Air Force

Civil Engineer, Washington, D.C., replacing Col Corson.

Col William P. Albrow became The Civil Engineer, Headquarters Air National Guard, Andrews AFB, Md., on July 14, replacing Col Janice M. Stritzinger, who retired. Col Albrow was previously the Civil Engineering Staff Officer for the 235th Civil Engineer Flight, Martin State Airport, Md.

Col Richard B. Stonestreet is now The Civil Engineer, Headquarters United

States Air Force Academy, Colo., replacing Col Mohsen Parhizkar, who now commands the 379th Expeditionary Mission Support Group.

Col Michael Smietana is now Chief, Housing Division, Office of The Air Force Civil Engineer, Washington, D.C. He replaces Col Bobbie L. Griffin, Jr., who is now Assoc. Director of Logistics Resources, Directorate of Resources, DCS, Installations and Logistics, Washington, D.C.



Goddard Passes

Maj Gen Guy H. Goddard, USAF (ret), former Air Force Director of Civil Engineering from 1968-1971, passed away on June 2, 2005.

During his tenure, the Directorate of Civil Engineering underwent a significant reorganization, including a workforce reduction of almost 20% despite a wartime workload and substantial CONUS and

overseas responsibilities. Maj Gen Goddard established the Civil Engineering Center at Wright-Patterson AFB, Ohio, a predecessor of today's Air Force Civil Engineer Support Agency.

A West Point Graduate, Maj Gen Goddard served with the Army Corps of Engineers throughout World War II, commanding the 842nd and 836th Aviation Engineer Battalions in the Pacific Theater. He served as command civil engineer, Caribbean Air Command, after transferring to the Air Force in 1948.

He also served as Deputy Chief of Staff, Operations, for the Aviation Engineer Force; Air Force Logistics Command Civil Engineer; Deputy Director for Construction; and Director of Air Force Civil Engineering.

The prestigious Society of American Military Engineers Goddard Medal is named in his honor.



Outstanding Civilian Award

Mr. Tom Denslow, 7th CES, Dyess AFB, Texas, recently won a 2005 Air Force Association Outstanding Air Force Civilian of the Year award. Named Civilian Program Manager of the Year, Mr. Denslow, along with winners in the three other award categories, will be honored by the association at its annual convention in Washington, D.C.

Selected for Promotion

Major

Patrick M. Albritton
Juan A. Alvarez
Tanya J. Anderson
Anthony R. Barrett
Frederick S. Berrian
Christopher D. Buzo
Christopher C. Carter
John A. Christ
Nathan D. Clemmer
Joseph Cook
Sara B. Deaver
Robert J. Devens
Anthony W. Dudley
James S. Duke

Richard E. Dwyer
Eric S. Fajardo
Manuel Fernandez
David Gwisdalla
Sean W. Haglund
Brian S. Hartless
Johnathan E. Hendrix
Elwood Henry
Kenneth B. Herndon
Shawn J. Jensen
Charles O. Kelm
Dat V. Lam
Anthony Lamar
Travis K. Leighton

Edward J. Liberman
Jason J. Loschinskey
David L. McCleese
David C. Meissen
Benjamin J. Morgan
Madison L. Morris
William C. Nelson, Jr.
David B. Novy
Patrick J. Obruba
Kevin L. Parker
Edward P. Phillips
Marcia L. Quigley
Randall L. Roberts
Todd D. Rupright

Iqbal A. Sayeed
Steven P. Schreffler
Erik M. Sell
Christopher Stoppel
Brian M. Stumpe
Mona A. Tenorio
Dawn R. Wagner
Tiffany J. Warnke
Karen M. Watson
Sean P. White
Paul A. Zackrison
Jason P. Zencuch

So You Wanna Be in Pictures...

Now more than ever, it's true that CEs can be found in just about every corner of the globe. Whether deployed or at home base, there are plenty of opportunities for photographs. The staff of *Air Force Civil Engineer* magazine wants to see what's going on around you, so we're putting out our first "Call for Photos." This isn't a formal competition, but rather an opportunity to show other CEs what's going on in your part of the world. There are a few rules:

1. The photos must be taken by CEs, not PAs, base photographers, etc.
2. The photos can be taken on- or off-duty, as long as CEs figure in the scene somehow. Examples: CEs repairing equipment or doing construction jobs while on duty, or CEs participating in activities such as marathons or base/squadron family days or relaxing with friends in a deployed cantonment area while off-duty. (No static group shots or photos of clowning around, drinking alcohol or eating.)
3. All photos must have a caption that identifies the people, the location, and the activity. Include your name, rank and unit, and the type of camera that you used.
4. The photos must have been taken in 2005.
5. Send digital photos (max 4.5 megabytes per message) to cemag@tyndall.af.mil with "Call for Photos" in the subject line, or

submit them on CD to AFCE Photo Call, AFCESA/CEBH, 139 Barnes Dr., Suite 1, Tyndall AFB FL 32403. Photographic prints (photo lab, not inkjet) can be mailed to the same address, but they will not be returned. 35mm slides or other transparencies are not acceptable.

5. Get local Public Affairs approval before sending mission-related photos. Ensure that subjects are wearing proper uniform and using any necessary safety gear, and that line badges or other sensitive items aren't visible.
6. Submission deadline is January 15, 2006.

The magazine staff will pick the best photos and include them in the first issue of 2006, due in March. We'll also list the names of all who submit photos, whether we print them or not.

To make sure that it's possible for us to print the pictures that you submit, please read our photographer's guidelines (in the blue box).

Keep in mind, too, that we're always looking for stories about CE activities. Articles can be technical or general interest. For detailed guidelines, send e-mail to cemag@tyndall.af.mil with "Author Guidelines" in the subject line and we'll send you a PDF that explains the requirements.

Get out there, get creative and start snapping!

*The first
Air Force
Civil Engineer
"Call for Photos"*

Photographer's Guidelines

Set digital cameras for highest quality (often called High, Fine, Ultra-Fine, Super-High or something similar). Save pictures as uncompressed .TIF or .PSD files, or highest-quality .JPG files, 3" x 5" or larger at 300 dpi.

Avoid "empty landscape" photos. Get as close to the subject as possible, so it fills the frame.

If your camera has only 'digital zoom' (as opposed to a true zoom lens), don't use it. Digital zoom just crops away part of the image

and blows up the rest, usually resulting in lower image quality.

Orient the camera to fit the subject. Tall buildings work better in vertical shots; wide bridges work better in horizontal.

Try to get the whole person in the frame; aim at the chest rather than the face. This will eliminate people cut off waist-high, with empty sky above them.

Building a Project Manager

Thanks to a major renovation of the senior “capstone course” at the U.S. Air Force Academy, civil and environmental engineering cadets of the Class of 2005 possess a more comprehensive understanding of design and construction project management than their predecessors.

**Maj Don Ohlemacher, P.E.
Capt Patrick Suermann
Dr. Jim Pocock, R. A.
U.S. Air Force Academy**

Civil Engineering 480, “Construction Management and Contracting,” is a required course for both civil and environmental engineering majors. Throughout the semester, cadets develop a project design and construction management plan to satisfy an owner’s requirements, applying their technical design skills while integrating the project management principles and methods taught in the course.

Instructors revised CE 480 for spring 2005. Using a new textbook that better paralleled the chronology of project execution, the course offered case-study analysis of real design and construction projects to enhance student visualization and culminated in a design-build competition. Cadets “worked” directly for faculty members posing as project owners, further enhancing the realism of the semester-long projects.

Working within the three basic phases of project execution—definition, design, and construction—cadets learned how to help

owners define the project scope and how to develop preliminary (order of magnitude) estimates and schedules. They were taught how to develop a conceptual (20%) design and to write detailed statements of work as a means of conveying design intent. Instructors taught cadets project scheduling techniques such as identifying major milestones and critical activities, as well as the use of PACES™ parametric estimating software to refine the project budget. Finally, cadets learned how to offer solicitations to bidders, select the contractor, and manage the contract after award. At each phase, they applied their new skills to develop their projects.

Instructors intentionally constrained the project budget and schedule to challenge the students’ ability to satisfy all of their owner’s needs. Cadets had to keep their owners informed on how the project was progressing and provide support for all decisions. After gaining the owner’s final approval, the cadets prepared request for proposal (RFP) documents and decided how contractors would be evaluated using a “best value” methodology.

Case studies showed students how to apply project management skills in complex, large-scale projects. One involved an Air Force Center for Environmental Excellence “Design-Build Plus” contract underway at the academy. This case study used numerous project documents and charrette information to illustrate the Air Force Project Definition process, and the cadets made site visits with base representatives, the Corps of Engineers, and the general contractor to understand how successful project partnerships are created. Another case study used an RFP for an educational facility at the Georgia Institute of Technology and six contractor proposals that were offered for the project. Given the RFP requirements, the cadets scored each contractor proposal to select the best

*Cadets visit a construction site.
(U.S. Air Force photo)*



contractor. They could see how contractors respond to RFPs and learn what elements (technical, format and presentation quality) make proposals more successful.

At the end of the semester, the stage was set for the course finale: the design-build competition. The class was divided into four teams. Each took on the identity of a large design-build company and competed for the award of a design-build contract for the Flight Line Munitions Storage Facility at Tyndall AFB, Fla., a project recently completed by the 325th Civil Engineer Squadron's SABER Flight.

The competition, modeled on a two-phase, sealed-bid procurement process, was very realistic. Competition standards were based on best practices from the annual Associated Schools of Construction Design-Build Competition. Teams had one week to develop a response to a request for qualifications before receiving the RFP for the project. In this phase, cadets studied important aspects of the "companies," including past performance in completing similar relevant projects and their managed quality and safety programs.

In the second phase of the competition, the teams created a nine-tab, professionally bound response to the RFP in 17 hours. In order to be considered responsive, bidding teams had to include a project schedule, a firm fixed-price cost proposal, a narrative statement of work, and conceptual design drawings. Several technical design calculations were also required to prove that the teams understood critical project components. After bid closing, each team delivered a 40-minute briefing to the selection panel—former and current department heads Brig Gen David Swint (ret.) and Col Greg Seely, with Lt Col Curt Van De Walle, BCE at Tyndall AFB, Fla.—who ultimately



decided which team won the contract award. The cadets' work far exceeded instructors' expectations, making the decision difficult.

Senior cadets prepare a bid for CE 480's design-build competition. (U.S. Air Force photo)

The capstone course and its culminating design-build competition validated the cadets' preparedness for future squadron roles in project management. Not only did they demonstrate how well they learned the management skills taught during the course, they also fully integrated their technical design abilities into managing two realistic project efforts. It was clear that the spring 2005 course revisions had an immediate and profound impact on the students. Student feedback showed that graduates were more motivated to begin their engineering careers as Air Force officers than in previous years. Undoubtedly, these—as well as future—Air Force Academy graduates will make great additions to your engineering flight as project managers.

Dr. Pocock is the Course Director of CE 480. Dr. Pocock and Maj Ohlemacher were the instructors for the course in spring 2005. Capt Suermann was in charge of the design-build competition.

Expanding Design Skills

Capt Brian J. Ballweg
Capt Ryan J. Novotny
AFIT/CEM

Greater numbers of Air Force civil engineer junior officers, with various levels of experience and technical education, are being placed around the world to face difficult multidiscipline design situations. The new challenges faced by these CE's have spurred a technical revival at the Civil Engineer and Services School (CESS).

A new course, ENG 480, Simplified Facility Design, was developed to broaden the design knowledge of engineers of all disciplines and backgrounds. The two-week curriculum guides junior civil engineers

pavements can use the CD-based guide to easily find the right pavement resource. The point-and-click, stand-alone reference contains a wealth of information, including pavement education, the appropriate Unified Facility Criteria, Unified Facilities Guide Specifications, and Engineering Technical Letters (ETL) published by AFCESA. The CD also includes important e-mail addresses for technical support, such as the AFCESA Reach-Back Center and the CESS. This "take anywhere" reference will give new field engineers the pavement guidance they need, wherever in the world they may find themselves.

The CESS at the Air Force Institute of Technology has a proud heritage, educating more than 50,000 students during its 57 years of continuous operation. The CESS is a valuable asset to the career field, as evidenced by support from civil engineer leaders, long-standing enrollment, and the continued excellence exhibited in the performance of our students. As the school continues to

develop innovative methods to educate the career field, the new Simplified Facility Design course and the CESS "Pavement Guide" will remain essential components that support the warfighter.

The next offering of ENG 480 will be April 2-14, 2006. CE captains and lieutenants can apply for this course online at <http://cess.afit.edu>, or contact Capt Brian Ballweg at brian.ballweg@afit.edu. To receive a copy of the CESS pavement guide contact Capt Ryan Novotny at ryan.novotny@afit.edu.

Capt Ballweg and Capt Novotny are instructors at the CESS, AFIT, Wright-Patterson AFB, Ohio.

Time	19-Sep-05 Monday	20-Sep-05 Tuesday	21-Sep-05 Wednesday	22-Sep-05 Thursday	23-Sep-05 Friday
0800	Welcome/Course Intro (Review pretest)	Site Layout Site Considerations Drainage AT/TP/RP	Construction Materials Site visit	Construction Considerations Review from Days 1&2 Vertical loads Columns, joists, and slabs	Fire Protection Building Construction (Suppression/detection)
0900	Building Scope	Preliminary Design Fundamentals	Foundations I Bearing Capacity	Construction Documents Introduction	NEC Overview Methods Equipment
1000	Building Program	Lunch	Lunch	Lunch	Lunch
1100	Site Selection	Codes	Foundations II Concrete Design Reinforcement	Structures I Rigid Framing and Truss Design Vertical loads Horizontal/lateral forces	Site/Civil Breakout Teams of 2
1200	Building Integration	Design Loads	Advanced Foundations Lab and Site Visit	Electrical Fundamentals I	Due at 0800 on Monday!
1300	Soil Fundamentals	Construction Methods Strength of Materials Methods Lab	Foundations Homework	Project Introduction	No Homework
1400	Programming Homework	Methods Homework			
1500					
1600					
0800	Advanced Structures Load-bearing walls	Review of Project Electrical Drawings	Plumbing I Requirements Piping/Fixtures	HVAC Systems II Equipment Mechanical Codes	Construction Critical Path
0900	HVAC Systems I Mechanical Design & Loads	Mechanical Equipment Air handlers	Plumbing II Traps Return Lines Vents/Penetrations	Renovations Overview	Project Close-out
1000	Insulation Vapor barriers Condensation	Lunch	Lunch	Lunch	Lunch
1100	Electrical Fundamentals I Transformers Generators Grounding	Mechanical Drawings	Roof Design Low/Pitched/SSM	Construction Documents Pulling it all together	Final Project Teams of 2
1200	Branch Circuit Design Panelboards Fuses/Circuit Breakers	Mechanical Lab Lab and site visit	Roof Components Insulation/Ventilation Penetrations	Reviews & Coord. Process	Final Project Introduction
1300	Electrical Homework	Mechanical Homework	Plumbing Homework	Engineering for Austere Locations May Vitrion via VTC	Course Critiques Due w/Final!
1400					
1500					
1600					

through the design of a basic one-story building. Students will develop construction documents that duplicate the reality of a design project in garrison or contingency operations. Students will learn all aspects of facility design, including civil, structural, electrical, mechanical, plumbing, roofing and fire-protection elements.

The CESS also developed a "Pavement Guide" for use in the field. New civil engineers facing the daunting task of design, construction and maintenance of airfield

Wright-Patterson AFB OH

Course No.	Title	Off.	Start Dates	Grad Dates
MGT 412	Financial Management	06A	17-Oct	28-Oct
ESS 070 (S)	Hazardous Waste Management	06A	09-Nov	09-Nov
ENV 020 (S)	Environmental Compliance Assessment	06A	14-Nov	17-Nov
ENV 101	Intro. to Environmental Mgmt. Flight	06A	14-Nov	18-Nov
ESS 010 (W)	Hazardous Waste Accumulation	06A	14-Nov	18-Nov
ENV 222	Hazardous Materials Management Process	06A	05-Dec	09-Dec
MGT 423 (S)	Project Programming	06A	05-Dec	16-Dec
ENG 460 (S)	Mechanical Systems for Managers	06A	12-Dec	16-Dec
ENV 419	Envir. Planning, Programming & Budgeting	06A	13-Dec	15-Dec

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 and Web classes.

366th Training Squadron

Sheppard AFB TX

J3ARR3E453-002	Pest Management Recertification	31-Oct/12-Dec	04-Nov/16-Dec
J3AZR3E051-003	Cathodic Protection Maintenance	24-Oct	04-Nov
J3AZR3E451-004	Fire Suppression Systems Maintenance	17-Oct/07-Nov/01-Dec	04-Nov/29-Nov/21-Dec
J3AZR3E051-007	Airfield Lighting Systems	17-Oct	26-Oct
J3AZR3E051-008	High Voltage Systems Maintenance	24-Oct	21-Nov
J3AZR3E051-010	Bare Base Electrical Systems	24-Oct/05-Dec	04-Nov/16-Dec
J3AZR3E051-016	High Voltage Cable Testing & Splicing	17-Oct/31-Oct	21-Oct/04-Nov
J3AZR3E071-001	CE Advanced Electrical Troubleshooting	20-Oct/28-Nov	17-Nov/23-Dec
J3AZR3E072-113	Bare Base Power Generation (Diesel)	11-Oct/28-Nov	04-Nov/22-Dec
J3AZR3E471-101	BB Water Purif. & Distr. Systems Maint.	12-Oct/26-Oct/05-Dec	21-Oct/04-Nov/14-Dec
J3AZR3E472-01AA	Liquid Fuels Maintenance Technician	07-Nov/05-Dec	21-Nov/16-Dec
J3AZR3E472-00AA	Liquid Fuels Maintenance Tank Entry	17-Oct	27-Oct
JCOZP32E1D-01AA	Readiness Flight Officer	17-Oct	14-Nov

Gulfport MS

Due to Hurricane Katrina, all classes at 366th TRS, Det 6, NCTC, Gulfport, Miss., will be canceled until further notice.

Ft. Leonard Wood MO

J3AZP3E571-003	Engineering Design	17-Oct/28-Nov	28-Oct/09-Dec
J3AZP3E571-005	Construction Materials & Testing	31-Oct	10-Nov
J3AZP3E971-005	NBC Cell	17-Oct/28-Nov	21-Oct/02-Dec

312th Training Squadron

Goodfellow AFB TX

X8AZR3E751 0R1A	Rescue Technician	03-Oct/11-Oct/18-Oct/25-Oct/ 01-Nov/28-Nov	24-Oct/31-Oct/07-Nov/15-Nov/ 22-Nov/16-Dec
X3AZR3E771 0F2A	Fire Officer II	17-Oct/02-Nov/28-Nov	01-Nov/18-Nov/13-Dec
X3AZR3E771 0I1A	Fire Inspector I	17-Oct/02-Nov/28-Nov	28-Oct/16-Nov/09-Dec
X3AZR3E771 0H4A	Fire Instructor III	14-Nov/12-Dec	18-Nov/16-Dec

Additional course information for the 366th TRS is available at <https://webm.sheppard.af.mil/366trs/default.htm> or <https://etca.randolph.af.mil>. Students may enroll on a space-available basis up until a class start date by contacting their unit training manager.

Additional course information for the 312th TRS is available at <https://www.goodfellow.af.mil/TRS312/newfire/index.htm>. Students must go through their MAJCOM CE staff to obtain training slots.

A full-page photograph showing two Airwomen in military uniforms working outdoors on a gravel surface. They are folding a large, dark, weathered tarp that is being placed over a larger, grey tarp. The grey tarp has a rectangular opening in the center, secured with a wooden cross-shaped frame. The background shows a chain-link fence and some construction materials.

Moving Day

SrA Tanya Hill (L) and A1C Danielle Alyias, structural journeymen from the 319th Civil Engineering Squadron, Grand Forks AFB, N.D., fold the outer covering of an Alaska Small Shelter for packing and reconstitution after tearing down the shelter at Tallil AB, Iraq. Both Airmen are deployed with the 407th Expeditionary Civil Engineering Squadron.

(photo by MSgt Mark Bucher)