Public Works DIGEST

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This Issue:
Annual Report Summaries

Capt. Daphne Mitchell-Wright leads a 31st Air Defense Artillery unit onto a Fort Sill, Okla., running track constructed to allow Soldiers to avoid several busy roads while running, the first step in an extensive plan to provide running trails on post. Photo by Maj. Jay Taylor, public affairs officer, 31st Air Defense Artillery. Page 28

IMCOM
SOLDIERS • FAMILIES • CIVILIANS

Public Works DIGEST

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Address mail to:
U.S. Army Installation Management Command
2405 Gun Shed Road
Fort Sam Houston, TX 78234-1223
Attn: Editor, *Public Works Digest*

Telephone: 202-761-0022 DSN 763
FAX: 202-761-4169
e-mail:
mary.b.thompson@usace.army.mil

Gregg Chislett
Chief, Public Works Division
Installation Management Command

Mary Beth Thompson
Managing Editor
U.S. Army Corps of Engineers

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Annual Report Summaries

Successes

Technical Support

Professional Development

Meeting Army challenges in 2011

by Maj. Gen. Merdith W.B. (Bo) Temple

The U.S. Army Corps of Engineers has good reason to be proud of its accomplishments this past year in the support of our nation's Soldiers, Civilians and Families at home and overseas. We have worked closely with the Installation Management Command and its Directorates of Public Works around the world, as well as the Office of the Assistant Chief of Staff for Installation Management and the Department of Defense, in accomplishing an outstanding fiscal 2011. This enterprisewide partnership has been critical to ensuring our Soldiers, their Families and Civilian employees have the best facilities possible in which to live, work and train.

Achieving this goal has become increasingly challenging with limited resources for base operations support and sustainment, restoration and modernization activities. One of the key adjustments we have had to make is transforming the way we support our customers.

Changes

We have moved away from overly prescriptive requirements to performance-based criteria and augmented design-build acquisition with site-adapt facilities. The improvements to the Corps' project delivery process now means that quality, adaptable and sustainable facilities can be designed and constructed safely in less time and more cost-effectively than ever before.

Key to this effort is the recent establishment of the Headquarters USACE Installation Support San Antonio Office. The professional staff includes liaison officers from Headquarters USACE, the Construction Engineering Research Laboratory, and the Engineering and Support Center, Huntsville. The staff serves as program advisors to our strategic customers — IMCOM, the Air Force Center for Engineering and the Environment, Army Medical Command, U.S. Army North, U.S. Army South and Army Environmental Command — advising on a variety of USACE technical capabilities and programs including Military Construction, SRM, energy conservation and environmental sustainability.

Maj. Gen. Merdith W.B. (Bo) Temple
Photo by F.T. Eyre

The office serves as the primary USACE on-site representative to facilitate coordination between our San Antonio-based customers and Headquarters USACE for decisions and guidance dealing with changes in policy, budget, program and project objectives, performance, public affairs and other matters.

These changes in our approach to installation support have USACE better postured to meet the challenges of future missions in what is expected to be a budget-challenged environment, all while building a stronger military and nation for years to come. We have focused on our role as Army "solutioneers," working as an integrated team with our Public Works partners and customers in the field to better support our nation, Soldiers, Civilians and Families.

Record year

Our efforts this past year have been focused on many fronts, including direct support to Army installation DPWs, international activities, Base Realignment and Closure close-out, and construction projects funded by the American Recovery and Reinvestment Act of 2009.

In FY 2011, the USACE major subordinate commands, centers, districts, offices and the Installation Support Community awarded nearly $3.7 billion in reimbursable construction-related work for Army installation DPWs and other DoD customers excluding real estate and other services. For FY 2010, that number was $3.5 billion.

USACE international activities included worldwide water resource management collaborations, civil-military emergency preparedness workshops, humanitarian assistance, foreign military sales, civil reconstruction and development assistance for foreign governments and technical assistance for international organizations. Primary customers were the combatant commands, U.S. State Department, the Millennium Challenge Corporation and the U.S. Agency for International Development. USACE engaged in some manner with more than 100 countries in the past year.

The FY 2011 USACE program of services executed for other non-DoD entities was about $2.2 billion. The largest Interagency and International Services customer was the State Department at $443 million, followed by the Federal Emergency Management Agency at $416 million, Customs and Border Protection at $394 million, the Veterans Administration at $345 million, and the Environmental Protection Agency at $291 million. Overall, more than 70 federal customers were supported. New nationwide agreements were signed with the National Park Service, Veterans Affairs and NASA.

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Acronyms and Abbreviations	
ARRA	American Recovery and Reinvestment Act
BRAC	Base Realignment and Closure
DoD	Department of Defense
DPW	Directorate of Public Works
EPA	Environmental Protection Agency
FY	fiscal year
IMCOM	Installation Management Command
SRM	Sustainment, Restoration and Modernization
USACE	U.S. Army Corp of Engineers

Public Works Division end-of-year report

by Gregg Chislett

We have seen many great articles in the Public Works Digest this year, which covers many of our aspects and challenges, providing an outstanding resource to communicate ideas and initiatives occurring across the Army's Public Works community. So upfront, thank you to all who contributed an article this year making this publication a professional resource and great success.

As we close the year, Directorates of Public Works are faced with many challenges to operate newly constructed facilities and maintain legacy facilities;

Gregg Chislett
U.S. Army photo

Acronyms and Abbreviations	
FY	fiscal year
IMCOM	Installation Management Command

reduce energy intensity, solid waste and water consumption; adjust master plans based on pending Army force structure changes; maximize barracks utilization; balance the allocation of sustainment funding to meet mission and infrastructure requirements; reduce staffing; and continue to provide services that meet demanding mission requirements.

The reduction in resources will ➤

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BRAC

As we work through completion of many long-term and much-needed programs, we are proud of our accomplishments in supporting the implementation of BRAC 2005. Primarily, USACE constructed $18 billion in facilities for our Army, Air Force and DoD customers, which is a scale four times larger than all previous BRAC rounds combined.

USACE also executed $1.6 billion in environmental requirements including $97 million in BRAC environmental work, $291 million in environmental quality work, $363 million in Defense Environmental Restoration Program work, $457 million for the Formerly Used Defense Sites Program and $312 million in EPA Superfund work. Those totals do not include $122 million in environmental support to the Civil Works' Formerly Utilized Sites Remedial Action Program and $109 million in nonenvironmental Military Munitions Support Services work. This is a tremendous effort that contributes daily to our nation's quality of life.

For FY 2011, USACE completed BRAC real estate transfers totaling 14,966 acres. The Army has now transferred 65 percent of the total surplus BRAC 2005 property back to local communities for economic redevelopment. For the 32,981 acres of the total available property, we have met the goal of transfer at the time of installation closure.

Getting this quantity of Army property transferred within the six-year BRAC implementation period is an unprecedented success within DoD for the current or any previous BRAC round. This success is directly attributable to the great teams we have working this program for our stakeholders.

We must continue to focus on timely transfer of the remaining BRAC properties. This strategy benefits the Army and IMCOM by avoiding continuing caretaking costs, and it benefits the communities by making the property available for economic redevelopment and job creation.

ARRA Facilities SRM

Finally, execution of construction projects resulting from ARRA continues to be a major focus for USACE. Eight divisions and 21 districts awarded 738 projects for $1.2 billion through the end of FY 2011. This represents 30 percent of the DoD Facilities SRM Program. USACE projects supported 46 Army garrisons, 23 Air Force bases, and 30 Army, Air Force and Marine Corps medical facilities and activities.

Construction has been ongoing since the fourth quarter of FY 2009. Actual construction through Sept. 30 was $1,051 million, ahead of the scheduled construction by $91 million or 8 percent. According to the P2 Project Management System, our 80 percent construction placement by Sept. 30 target was met three months ahead of schedule. This was also due to a combination of good construction management and contractors accelerating their schedules. Contract modifications did not adversely affect the overall program schedule. Most of the remaining construction placement of $146.5 million, or 12 percent, will be completed in the second quarter of FY 2012.

Ahead

Now more than ever, we are ready to face the challenges ahead in 2012. Working side by side with the Department of the Army, program managers and installation DPWs in the planning and execution of critical programs here in the United States and abroad, we are moving forward with new and innovative solutions that meet military mission requirements while ensuring our Soldiers, Civilians and Families have the best facilities possible.

Maj. Gen. Merdith W.B. (Bo) Temple is the acting chief of engineers, USACE.

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require facilities to last longer and be more efficient, which will challenge the norm. We will now be forced to be more innovative, leverage new technology in the operations and maintenance of our infrastructure, and improve annual work plans so we can achieve these challenges. We must also keep sharp our skills, ensuring we leverage our professional development to learn both the leadership and science aspects of Public Works.

Based on the accomplishments of last year, I am confident that, as a community, we will rise as victors and not victims of the challenges before us. Below is a summary the Public Works community accomplishments in fiscal 2011.

Facilities reduction – We effectively reduced the Army's facility inventory by 3.3 million square feet, consisting of 526 facilities. At the completion of these demolition contracts, the Army will require about $10 million less in sustainment funding, $4 million less in energy costs and $4 million less in base operations costs.

Maintenance and repair – We processed 46 maintenance and repair project approval documents that exceeded a total value of $606 million in major facility repairs, making FY 2011 a great year for maintenance and repair. Processing of the projects required close coordination with the garrison and the Office of the Assistant Chief of Staff for Installation Management as updates and edits were completed to ensure acceptance and approval.

These projects included repairs to heating, ventilation and air conditioning systems; roofs; electrical systems; and mold remediation. Major renovations included training barracks and permanent party barracks; the U.S. Military Academy at West Point, N.Y., Auditorium; maintenance facility upgrades; administrative facility upgrades; aircraft maintenance hangars and road upgrades, to name a few.

This work will result in an overall improvement in the condition and reliability of the Army's facilities.

Transportation infrastructure – We inspected 792 bridges, 67 dams, 279 miles of active railroad tracks, nine airfield pavements and 15,774 feet of waterfront berthing. We conducted four training classes that certified 30 railroad track inspectors, 30 bridges safety inspectors, 22 dams safety inspectors and 30 students on Army airfield pavement repairs.

IMCOM worked on implementing the PAVER sustainment management system for roughly 5 million square yards of primary, secondary and tertiary roads for the cantonment area at five garrisons.

We also executed $9.7 million worth of strategic mobility requirements, including 13 transportation repair projects at six Army installations. These projects were identified to support key installations and enhance capability at rail heads, airfields (if the airfield is designated an aerial port of embarkation), container yards and deployment processing facilities.

Networking – We shared garrison best practices. IMCOM selected Fort Hood, Texas, Joint Base Lewis-McChord, Wash., and Fort Bliss, Texas, to determine their solid waste program management best practices. Information about several of the best practices — such as composting, single-stream recycling and cardboard recycling buyback — are posted on the IMCOM Public Works website at *https://www.us.army.mil/suite/doc/32930232*. IMCOM installations are encouraged to share their best practices to be added to the list provided in this website.

Housing – We trained Army housing personnel in Europe and Asia on a wide variety of housing subjects, including Family housing, budget management and execution, Residential Communities Initiative, the First Sergeants Barracks Program, Career Program 27 and DD Form 1391 development and project planning.

The Army replaced various housing management systems at 52 garrisons with the Enterprise Military Housing joint system, known as eMH, used by the Navy, Marines and Army. This system will be more efficient and make it easier to analyze and manage the Army's housing inventory.

Energy and water – We invested $181 million in garrison energy and utility infrastructure projects that:

- replaced incandescent bulbs with CFLs or LED lamps;
- installed programmable thermostats;
- replaced T12 fluorescent lamps that have standard ballasts with T8 or T5 lamps with electronic ballasts;
- installed or replaced weather stripping on entryways where gaps were visible;
- caulked joints, window frames, door jambs and wall penetrations;
- installed lighting motion sensors;
- replaced motors and pumps with high-efficiency Energy Star equipment;
- installed timing controls for pump motors during high-use or high-demand times, allowing them to be off during low-use times; and
- recommissioned numerous buildings.

IMCOM received seven out of the eight awards demonstrating commitment and excellence in energy and water management at the 33rd annual *Secretary of the Army Energy and Water Management Awards.* Congratulations to **Jeffery Presgraves** and **Keith Pomraning**,

Public Works Digest 2012 Schedule

Issue	Theme	Deadline
Jan-Feb	Master Planning	Dec. 12
Mar-Apr	Housing and Barracks	Feb. 13
May-Jun	Environment and Sustainability	April 13
Jul-Aug	Operations and Maintenance and Engineering	June 13
Sep-Oct	Energy, Water and Waste	Aug. 13
Nov-Dec	Business Operations	Oct. 11

Afghanistan Engineer District-South ends 2011 on high note

by Karla Marshall

The U.S, Army Corps of Engineers' Afghanistan Engineer District finished strong in fiscal year 2011, awarding 45 contracts and placing almost $54 million in construction in September.

"The project management business process really worked for the district," said Deborah Duncan then deputy district engineer for Programs and Project Management Division, who has since returned to the states. "I was concerned that the district would not be able to award some of the year-end requirements. Funds were committed late in the year, requirements were changing, and schedules left no time for normal rework."

The project delivery teams were the keys to mission success, Duncan said. Contracting, Project Management, Office of Counsel, the customers and Resource Management applied their collective experience and talents to accomplish the mission.

"Overall, we placed 1,108 contract awards for fiscal year 2011 at a total dollar value of $968,871,194," said Bonnie Perry, chief, Contracting Branch. "This is nearly double our awards in fiscal year 2010, and the total dollar value of contracts increased by 154 percent over the previous year.

"I have an awesome staff, and the credit for this achievement belongs to them, to the district Resource Management Office and Office of Counsel," Perry said.

"The bottom line is that we have had a very successful year," said Air Force Col. Benjamin Wham, district commander. "It did not just happen this week. It started many months ago with great district leadership across the board and great effort on the part of everyone in the district.

"We had a great vision, worked with our customers to develop good solutions and partnered with our contractors to resolve difficult issues and educate them about the USACE contracting process. And we could not have done it without the great support we received from our fellow USACE teammates at the Middle East District, the Transatlantic Division and the Joint Program Integration Office, which works with U.S. Forces-Afghanistan," Wham said.

While the Contracting Branch and others were working long hours to award new contracts, the district's Construction and Engineering Division and field offices were keeping pace, ensuring that contractors were meeting milestones to complete projects. The district currently has 164 ongoing construction projects worth more than $2 billion.

Construction placement measures how well the district is doing at completing projects. In fiscal year 2011, the South District placed $528 million worth of construction. This total amounted to $2.1 million of placement during the year for every person working in the district, and it was 87 percent of the scheduled placement for the year, a remarkable feat in the complex, difficult Afghan environment.

On Kandahar Airfield, a large paving machine places concrete at night so that the concrete does not have to cure in the heat of the day. Photo by Mark Ray, South District

The district placed $53.5 million of construction in September alone, according to Donny Davidson, Herat area engineer, who acted as the district's chief of Construction Branch during September.

"We awarded almost all of the contracts we set out to award and with great ➤

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Aberdeen Proving Ground, Md.; **Pat Walsh**, **Pat Appelman**, **Warren Clifford**, **R.J. Dyrdek** and **Steven Fries**, Fort Knox, Ky.; **Willimore Mack** and **Paul Lindemer**, U.S. Army Garrison Kaiserslautern, Germany; **Bobby Lynn**, **Richard Strohl**, **Donald Clary**, **Huey Keaton** and **Cody Tippit**, Fort Hood, Texas; **Denise Kelley**, **Randy Parks**, **Stanley Thomas**, **Tressa Rutland** and **Matthew Bolen**, Fort Stewart, Ga.; **Regina Kranz**, U.S. Army Garrison Ansbach, Germany; **Lt. Col. Charles Koehler**, **John Costea**, **Richard Havrisko**, **Michael Maier** and **Thomas Struble**, Picatinny Arsenal, N.J.; for a job well done.

Planning – IMCOM installations published several area development plans that improved garrison master plans by focusing on smart development and land use, and on sustainable and walkable Army communities.

Real property – We improved the accountability of IMCOM's real property by making reporting systems more accurate and auditable.

Environment – We established an IMCOM environmental staff that will work in partnership with Army Environmental Command and Headquarters Department of the Army in support of garrison environmental programs.

I look forward to reading this year's articles about how you are meeting the many challenges in the Public Works community. Check the schedule of themes and deadlines for 2012 on page 5 or online at *http://www.imcom.army.mil/hq/publications/pwd_digest/themes_and_deadlines.*

Gregg Chislett is the chief, Public Works Division, Headquarters IMCOM.

Huntsville Center missions surpass $1.7 billion in fiscal 2011

by Valerie Shippers

Contracts for installation support projects awarded by the U.S. Army Engineering and Support Center Huntsville, Ala., in fiscal year 2011 totaled an impressive $1.7 billion. Huntsville Center is the U.S. Army Corps of Engineers' Installation Support Center of Expertise. Its project managers partner with Corps districts, Directorates of Public Works, Headquarters Installation Management Command and other federal agencies on projects.

The ISCX links state-of-the-art business practices and innovative processes to provide comprehensive and cost-effective support to DoD installations. Through its virtual project teams, ISCX delivers centralized management with decentralized execution.

Army Stationing Facilities Support

ASFS coordinates facilities requirements analyses and leads planning charrettes for Army installations that will see the move of more than 140,000 personnel during FYs 2010-13. ASFS also provides IMCOM with centralized support for master planning and Military Construction programming. Support includes managing program resources, normalizing associated costs and assisting with Office of the Assistant Chief of Staff for Installation Management- and IMCOM-directed studies.

Valerie Shippers
Photo by William S. Farrow

In FY 2011, 48 economic analysis requests were completed. Economic analyses include lease and buy analyses and source-of-funding determinations for Corps districts and installations and are components of relocatable facility request packages.

Planning and Programming

The Planning and Programming team manages installation planning services that include MILCON planning charrettes, facility requirement analyses, area development plans, real property master plan updates, comprehensive energy and water management plans, real property inventory updates, facility utilization studies and infrastructure capacity analyses.

In FY 2011, in addition to ongoing program actions, Planning and Programming awarded 21 requirements analyses, 19 planning charrettes, three area development plans, seven infrastructure capacity analyses and three real property management plans at a value of about $3.1 million.

MILCON Business Process Center of Standardization

The facilities built through the MILCON program are critical to the success of the modular Army. Huntsville Center leads COS efforts for 17 facility types and works with proponents to further develop and modify Army standards for these facilities.

The COS, in partnership with geographic Corps districts, awarded more than $44.5 million of MILCON in FY 2011. Following award of 29 facilities in FYs 2009-10, the COS provided technical support to the field's construction efforts. The COS also initiated continental U.S. regional design-build range multiple award task order contracts and assisted Corps districts in requests for proposal development.

To aid future planning and programming, the COS continued development of template DD Form 1391s, available through the Programming Administration and Execution

Acronyms and Abbreviations	
ACP	Access Control Point
ASFS	Army Stationing Facilities Support
COS	Center of Standardization
CUP	Commercial Utilities Program
DoD	Department of Defense
ECIP	Energy Conservation Investment Program
EEAP	Energy Engineering Analysis Program
FRP	Facilities Reduction Program
FRR	Facilities Repair and Renewal
FY	fiscal year
IDIQ	indefinite delivery-indefinite quantity
IMCOM	Installation Management Command
IMMSS	Integrated Modular Medical Support Systems Program
IO&T	Initial Outfitting and Transition Program
ISCX	Installation Support Center of Expertise
MATOC	multiple award task order contracts
MILCON	Military Construction
MDMS	Meter Data Management System
MRR	Medical Repair and Renewal
OACSIM	Office of the Assistant Chief of Staff for Installation Management
OMEE	Operation and Maintenance Engineering Enhancement
REM	resource efficiency managers
RTLP	Ranges and Training Land Program
SRM	Sustainment, Restoration and Modernization
UMCS	Utility Monitoring and Control Systems

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value, and made great strides toward completing the projects we have on the books," said Wham.

"Successfully executing our large and complex program is how this district keeps faith with our customers, the nation and the Afghan people," he said. "Our success this year will be a springboard to further excellence next year."

POC is Karla Marshall, 540-722-6263, karla.k.marshall@usace.army.mil.

Karla Marshall is a public affairs specialist, Afghanistan Engineer District-South (Kandahar), U.S. Army Corps of Engineers.

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processor, for standard facility types.

Ranges and Training Land Program

The RTLP provides program management and engineering support to the Range Modernization Program, which consists of more than 250 Army, Army Reserve and National Guard projects. Support includes establishing engineering criteria and standard designs, initial planning and site selection, facilitating planning charrettes and preparing MILCON programming documentation.

The RTLP provides programmatic oversight and technical support to Corps districts responsible for range design and construction. Project assessments evaluate training and surface danger zone capabilities; constructability, standard design and National Environmental Policy Act compliance; telecommunications infrastructure; and unexploded ordnance.

Army Centralized Furniture Program

Huntsville Center is the Army Centralized Furniture Program manager for barracks and administrative furnishings. Customers include Army Contracting Command and Navy and Air Force installations. Competitive procurements using General Services Administration schedules result in fair opportunities for manufacturers, consistent quality and maximum cost. The program also monitors projects for on-time delivery.

This office furniture is a sample of the type of systems installed in more than 400 administrative buildings through the Army Centralized Furniture Program.

In FY 2011, the program completed the Base Realignment and Closure Furnishings Program, furnishing 400 administrative buildings and 102 barracks buildings for a total of $242 million. Total cost avoidance was $109 million, or 31 percent of the estimated value of the program. The FY 2011 projects for the Army, Navy, Air Force and Marine Corps Reserve furnished 343 administrative buildings and 278 barracks buildings for a total of $240 million, with cost avoidance of $19 million, or 8 percent of GSA pricing.

Facilities Repair and Renewal Program

The FRR Program offers a fast, efficient method for design and execution of all types of facility repairs, renovations and minor construction. This program is available to districts and their customers as part of the "one-door-to-the Corps" policy. The key to the program's success is the innovative use of indefinite-delivery, indefinite-quantity service and construction contracts covering all 50 states plus U.S. territories.

The FRR Program has two execution strategies. The architect-engineer IDIQ service contracts provide designs, studies, investigations, surveying and mapping, tests and planning support. The design-build IDIQ construction contracts are MATOCs with design-build capabilities. The task order award takes an average of 45 days.

In FY 2011, FRR awarded $50 million in repair, renewal and construction contracts in more than 30 actions.

An aerial photograph shows the Digital Multi Purpose Range Complex at Fort Bliss completed in FY2011 under the Range and Training Land Program. Photos courtesy of Huntsville Center

Facilities Reduction Program

The FRP identifies best industry practices and develops regionally focused MATOCs around them to cost effectively remove excess facilities. The FRP can put specialized demolition contractors at the right place at the right time to provide customers with significantly lower demolition costs, minimal time to remove a facility, maximum salvage or recycle credit and maximum landfill diversion.

The two most important FRP metrics are cost per square foot and landfill diversion percentage. Army policy requires a minimum of 50 percent of a demolished building's weight be diverted from landfills.

In FY 2011, the program awarded more than $25 million in demolition for the Army, NASA and the Army Reserve. By maximizing recycling and grinding concrete for use as aggregate and engineered fill, the FRP team achieved an average diversion rate of 72 percent. FRP contracts generated an average cost per square foot for the Army of less than $7 and will remove almost 3.5 million square feet of excess facilities.

Access Control Point Program

The ACP Program provides contracting, engineering and management capabilities for ACP efforts. Its primary customer is the Office of the Provost Marshal General.

The current phase of the Provost Marshal-funded ACP Equipment ➤

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Program is more than 88 percent complete. ACPs have been prepared to receive the automation installation entry system at 28 of 34 continental U.S. installations on the customer's priority list. Most of the remaining six sites are about 80 percent complete.

In FY 2011, the program added a customer. It awarded upgrade projects at Navy hospital facilities in two locations. The ACP Program also worked to improve coordination between the agencies involved with Army ACPs. The Army Standard for ACPs is being revised, and Huntsville Center provided insight and lessons learned from the execution perspective.

The ACP Program is developing three acquisitions that will be available in FY 2012: design-build, AE services and maintenance.

Utility Monitoring and Control Systems Program

The UMCS Program Mandatory Center of Expertise designs, procures and installs complex monitoring and control systems for customers at Army garrisons, Department of Defense and other federal agencies. These systems include: building automation; supervisory control and data acquisition; advanced metering; fire alarm; heating, ventilation and air conditioning; photovoltaic; and alternative or renewable energy sources.

A gate at the Army National Guard Readiness Center in Arlington, Va., is an example of full life-cycle support from the Access Control Point Program.

The UMCS Mandatory Center of Expertise develops and maintains design criteria, prepares and reviews designs and test procedures, and provides technical assistance during procurement, installation, testing and commissioning as well as trouble-shooting services. Acquisitions are accomplished through single- and multiple-award IDIQ contracts.

In FY 2011, UMCS awarded about 785 contract actions for roughly $294 million. The UMCS team manages an active task order award value of more than $500 million.

Electronic Security Systems Program

The Electronic Security Systems Program supports customers at Army garrisons worldwide, the National Guard Bureau, Marine Forces Reserve, DoD and other federal agencies. In FY 2011, the program awarded $49.1 million in contract actions to push the total current workload to $180 million.

Medical Repair and Renewal Program

The MRR Program offers a fast, efficient method for design and execution of medical facility repairs, renovations, minor construction projects and facility support services. MRR provides program and project management, engineering, contracting and construction support to federal agencies.

The program has numerous contracting tools and IDIQ contracts available. The contractors were selected for their experience and ability to perform in medical facilities and are knowledgeable about The Joint Commission and the Accreditation Association for Ambulatory Health Care requirements and other health care criteria and regulations.

In FY 2011, the MRR program managed about 120 medical facility repair and renovation projects, valued at more than $380 million, for the U.S. Army Medical Command, the Air Force, the Navy and the Department of Veterans Affairs.

Operation and Maintenance Engineering Enhancement

The OMEE Program provides a simplified way to respond to the growing operation and maintenance needs of DoD medical facilities worldwide. The OMEE Program uses streamlined processes that offer low-cost, quick response contracts for the operation, preventive maintenance, repair and replacement of equipment and other facility support.

The program has two suites of IDIQ service contracts. The contractors were selected for their ability to perform in medical facilities and are knowledgeable in The Joint Commission and Accreditation Association for Ambulatory Health Care requirements. These contracts provide scheduled maintenance, corrective maintenance, pest management, aseptic management, grounds maintenance and biomedical equipment maintenance, repair and replacement services for medical or nonmedical facilities.

Integrated Modular Medical Support Systems Program

The IMMSS Program provides modular medical systems furniture for Army and tri-service medical facilities worldwide. These systems are designed for hospitals, clinics, pharmacies, medical administrative facilities, labs and medical storage facilities. The systems are designed to be durable, easily cleanable and reconfigurable to any medical facility use.

The IMMSS Program also provides nonsystems furniture for offices, waiting rooms and high-density storage. It can usually provide any furnishings, ➤

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exclusive of medical equipment, required in medical facilities.

The program established a suite of blanket purchase agreements with three systems furniture manufacturers, which were selected based on their ability to meet the functional, interchangeability and reconfiguration requirements of medical facilities. The manufacturers provide functionally equivalent systems, which can differ in color, style and appearance but meet all IMMSS requirements.

In FY 2011, the IMMSS Program executed 272 orders totaling $38.4 million. The capacity of all blanket purchase agreements is $400 million over a five-year period that began in June 2010. For other furniture requirements, the program uses GSA Federal Supply Schedule contracts or openly competed orders.

The Initial Outfitting and Transition Program

The IO&T Program offers turn-key project support for the equipping and transitioning of staff and patients for the U.S. Army Medical Department's military health care and medical research laboratory facility construction and renovation projects nationwide and overseas. The program provides a wide range of services to ensure that when a facility is fully operational, it can effectively and efficiently support its mission.

The IO&T Program established two, four-year IDIQ MATOCs. The unrestricted IDIQ MATOC includes a pool of five contractors with a capacity of $409 million. The restricted IDIQ MATOC has a pool of five small business contractors with a total capacity of $81 million.

In FY 2011, the IO&T Program managed about 20 task orders valued at more than $57 million.

Army Metering Program

To comply with the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, advanced meters, known as smart meters, are being installed on about 8,700 Army, Medical Command, Reserve and National Guard facilities to monitor and electronically report consumption of electricity, natural gas, steam and water.

The plan is for meter data to be electronically transmitted to a central database, the Meter Data Management System, an enterprise system that will collect, analyze and display meter data at the installation, region and headquarters levels. The MDMS collects meter data from all installation production and consumption sources and provides the energy manager with a comprehensive display of the installation's energy footprint. MDMS allows the energy manager to compare the energy use of buildings of similar use and size, measure the installation's total energy consumption and generation, and develop and validate projects that reduce energy use.

As of FY 2011 end, the number of meters installed since program inception exceeded 7,000. A total of 10,000 meters are contracted for installation. About 200 meters are now reporting from the three installations that have the MDMS. MDMS fielding began at 43 other installations and will be fielded at more installations during FY 2012.

Huntsville Center is working with the Army's information assurance organizations to resolve meter connectivity and establish a path forward by March. Meter data will be transferred to MDMS when these issues are resolved.

The installation of gas and steam meters will begin after electric meter installations are completed.

A worker strides along a row of solar panels installed atop a dining facility at Fort Bliss, a project that is part of a program that helps installations meet energy conservation goals.

Energy Savings Performance Contracting

This program delivers energy- and water-reducing capital improvements that the garrisons cannot fund through existing operating funds or other sources. The energy service contractor provides the capital and expertise to make comprehensive energy- and water-efficiency improvements and maintains those improvements in exchange for a portion of the generated savings. The energy service contractor guarantees the improvements will generate sufficient savings to pay for the project over the term of the contract, which cannot exceed 25 years.

More than $565.4 million in private-sector-financed infrastructure improvements have been constructed at 49 Army installations since FY 2000. Energy savings total about $62.5 million per year.

Unlike FY 2010, all FY 2011 new starts were garrison-funded for the measurement and verification phase. FY 2011 awards included:

- a $26.5 million project at the U.S. Military Academy at West Point, N.Y., with a payback of 17 years, nine months and a guaranteed first-year savings of $2.07 million;

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- a $12.3 million project at the Space and Naval Warfare Systems Command San Diego that will provide an annual savings of about $1 million and a project payback term of 19 years, two months;
- a $4.8 million project at the Red River Army Depot, Texas, with a capital investment of $4.8 million and a payback term of 17 years with a guaranteed first-year savings of $0.45 million;
- a $3.5 million project at Fort Bliss, Texas, with a payback of 19 years, four months and a guaranteed first-year savings of $0.32 million; and
- an $11.1 million project at Aberdeen Proving Ground, Md., that has a payback of 11 years, six months and a guaranteed first-year savings of $1.5 million.

Resource Efficiency Manager Program

This program places energy expert consultants at Army garrisons to help installations meet energy goals by finding, developing and employing conservation measures and renewable projects. IMCOM funds the first year of REM services, and the garrison funds the subsequent year options.

REMs have identified energy savings opportunities that yield as much as 10 times their annual salary cost, and they provide valuable assistance in using energy project funding streams. If the REM does not produce a positive return on investment, his or her contract is not renewed. Total expenditures on REM contracts are $3.7 million, which equates to a total program value of 5.4 times what the Army has invested.

In FY 2011, the REM Program was not centrally funded by IMCOM, however, Huntsville Center awarded REM contracts at two installations and the Oregon Nation Guard, and option year extensions for REMs for seven installations. REMs identified about $30 million in yearly savings with more than $20 million in realized savings from executed projects and initiatives. The total project life savings if all REM-identified projects and initiatives were implemented by the Army would total more than $200 million.

Commercial Utilities Program

This centrally funded program ensures utilities are purchased using the best terms and rates available and resold to garrison tenants in compliance with policies and regulations.

The Army averages six hearings annually at which utility companies seek rate increases of from 6 to 22 percent. The CUP provides a consultant to represent the Army as an expert witness at these hearings, helping to avoid or minimize increases. The CUP also assists garrisons in reviewing utility billings to ensure the proper rates are being applied and to catch other errors, and it approves utility contracts.

In FY 2011, the CUP saved the Army $1.6 million by intervening in two rate increase filings and by negotiating directly with utility companies for a cost of only $57,000. About $30,000 was recovered when the Army was charged for invalid taxes by a utility company.

Energy Engineering and Analysis Program

The EEAP leverages the expertise and capabilities of Corps and Department of Energy labs and contracted subject matter experts to perform: energy consumption assessments, renewable and non-renewable energy conservation project recommendations, oversight of selected options, assistance with local energy programs, energy-related training, water conservation and wastewater treatment. The EEAP went from a $60,000 program in 2008 to $20 million in 2011.

In FY 2011, capital investment strategies were completed for EEAP surveys at eight installations. Specialized energy studies were conducted at three others. EEAP surveys were also completed for Corps Civil Works projects and at several Defense Logistics Agency locations, the 88th Readiness Support Center, Air Education Training Command and Joint Base Operations San Antonio.

At year-end, Levels 1, 2 and 3 assessments and feasibility and specialty studies were awarded at 12 Army sites, two Air Force sites, one Defense Logistics Agency site and one Marine Corps site.

Energy Conservation Investment Program Validation Program

Huntsville Center provides program and technical support to OACSIM by preparing and validating DD Form 1391s and assisting with project status inquiries for the ECIP Validation Program.

Since the inception of this program in November 2010, the validation team made initial comments for the FY 2011 program, validated projects for the FY 2012 program and reviewed 200 projects submitted by the Army, Army Reserve and National Guard to develop the ECIP five-year Future Year Defense Program with an annual budget of $50 million.

Energy Execution Program

This program designs and executes energy-specific technology projects for Army garrisons, DoD and other federal agencies. Funds for these projects are typically provided through Sustainment Restoration and Modernization or ECIP.

In FY 2011, Huntsville Center assisted in awarding and executing four ECIP or Military Construction Army-funded projects and more than 15 SRM and Operation and Maintenance Army-funded projects totaling $35 million.

POC is Steve Lewis, ISCX, Huntsville Center, 256-895-1397, stephen.r.lewis@usace.army.mil.

Valerie Shippers is the director, Installation Support and Programs Management Directorate, Huntsville Center.

Corps research center promotes installation sustainability

by Ilker Adiguzel

Very busy and productive" summarizes the past year for the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory. With a mission to conduct research and development for sustainable military installations, the lab's capabilities and expertise touch virtually all facets of facility acquisition, energy, water and waste reduction, land conservation and facility life-cycle management.

Here are some highlights of CERL's fiscal year 2011 activities.

Ilker Adiguzel
Photo by Sandra Bantz, ERDC-CERL

Acronyms and Abbreviations	
ASA-IEE	assistant secretary of the Army for installations, energy and environment
BIM	Building Information Modeling
CERL	Construction Engineering Research Laboratory
COBie	Construction Operations Building information exchange
DoD	Department of Defense
DPW	Directorate of Public Works
ERDC	Engineer Research and Development Center
OACSIM	Office of the Assistant Chief of Staff for Installation Management

Researching toward net zero

Energy security and independence remain top priorities for the Department of Defense. Supporting the assistant secretary of the Army for installations, energy and environment's announcement of the first net-zero installations, CERL has been engaged in partnerships with many stakeholders to help reach goals for energy, water and waste. Researchers participated in the ASA-IEE selection process and are actively involved in multiple initiatives to support installation Directorates of Public Works as they organize to reach net zero.

A growing concern in DoD is the potential for cyber attack to vulnerable electric grids that could cause major mission disruptions at military bases. A CERL energy team is serving as technical manager for the Joint Capability Technology Demonstration led by the U.S. Pacific Command and U.S. Northern Command.

Called "Smart Power Infrastructure for Energy Reliability and Security," or SPIDERS, the project will integrate cyber-secure smart grids with renewable energy at three sites: Joint Base Pearl Harbor-Hickam, Hawaii; Fort Carson, Colo.; and Camp Smith, Hawaii. Operating experience from each of three phases will build toward the first DoD installation with a smart, "island-able" — meaning it can operate independent of the local utility grid — and cyber-secure microgrid at Camp Smith. The microgrid will consist of task-critical assets, office buildings, housing units, wind and solar energy, energy storage and emergency generators all protected by a layered defense.

The lab also completed a study for the Combined Security Transition Command–Afghanistan, which had sought recommendations for installing renewable energy technologies at the new Afghanistan National Security University. CERL evaluated possible options and then provided a recommended list, including information from a reality check by two researchers who visited the campus site in Kabul.

Advancing science for facility security

CERL is leading a multi-institutional effort to develop and integrate ultra-efficient air purification systems and self-decontaminating surface materials for the protection of DoD buildings from airborne biological threats. Current building air security systems, which are based on sensors and energy-intensive high-efficiency particulate air filters, are too costly and high-maintenance for most DoD buildings.

This research will result in integrated air security systems that are more affordable, consume less energy and require minimal maintenance. In this multi-year effort, state-of-the-art technologies, including acoustic air purification and biocidal enzyme-based nanocomposite paints, are being transitioned from lab to pilot scale.

The lab is also leading a major effort to develop a greener decontaminant for rapid remediation of large DoD infrastructure, such as an air base, in the wake of an anthrax attack. Conventional decontaminants are difficult to deploy in large quantities at forward operating bases due to their high storage footprint, corrosivity and toxicity.

With a bio-inspired enzyme-based approach, CERL and its collaborators are leveraging recent breakthroughs in molecular biology and materials science to inactivate *Bacillus anthracis* spores in a highly efficient, targeted manner. The goal of this project is to reduce forward operation base decontamination response times from several months to just two weeks. The Defense Threat Reduction Agency is funding the research.

Checking water safety on site

Rapid, portable, on-site detection of water contaminants, versus sending samples to fixed laboratories, will provide Soldiers with the major advantage of being able to test water sources in their areas of operation. Recent technological advances allowed for the creation of tiny microfluidic chips that reproduce the performance of large analytical instrumentation in a miniaturized package with faster results ➤

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and much reduced costs. Until now, these devices have been confined to laboratory use.

The SafePort portable water analysis system will bring rapid chemical analysis to the field, minimizing down time while awaiting results and substantially reducing analytical costs. SafePort was developed through a partnership involving CERL, Eksigent Technologies, Colorado State University and the University of Notre Dame.

The system consists of a portable, user-friendly hardware unit that accepts various user-selected, interchangeable microfluidic chips for rapid detection and quantification of chemical species in water and for toxicity screening. The goal is to bring microfluidics-based analysis of water samples to the field with push-button operating simplicity, providing accurate, actionable answers to Army personnel in minutes.

Improving facility delivery with technology

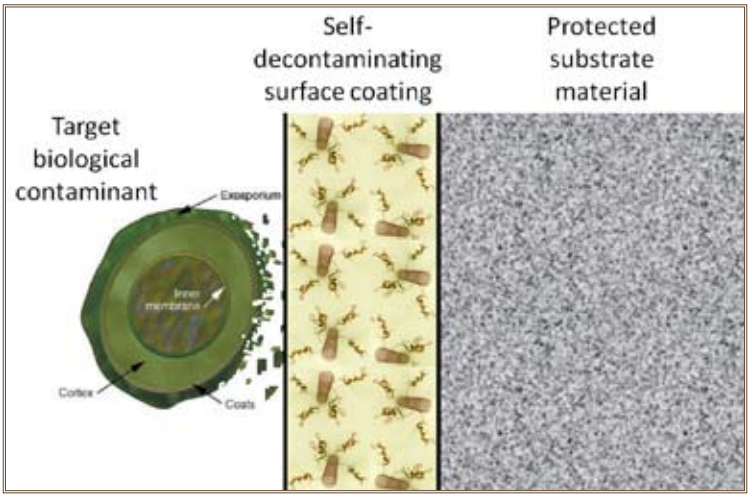
During a facility's design using Building Information Modeling, manufacturers often provide information of little use to the designers, such as fan belt size and pump base plate configuration. However, this information is critical to improving efficiency within the DPW operations and maintenance community.

A project launched this year seeks to ensure that when a facility with BIM is delivered to an installation, operations and maintenance personnel will find it useful for their work and embrace it. The approach identifies and extracts information generated by the Construction-Operations Building information exchange standard, or COBie, that can facilitate maintenance and repair over the building life cycle.

The project is funded by the Office of the Assistant Chief of Staff for Installation Management's Installation Technology Transition Program and will result in a new standard called "Operator's Property information exchange," or OPie.

COBie, which is currently being balloted as part of the National BIM Standard, is also being piloted at the Corps' New York District. The pilot will demonstrate the use of fully electronic construction submittals, provided through ProjNet-eSubmittal, directly linked to the Resident Management System and Contractor's Quality Control Module. The Corps is developing a strategy to implement COBie Corpswide.

Another Installation Technology Transition Program project will identify the points of intersection among the BUILDER sustainment management system, the *High Performance and Sustainable Buildings Guidance* requirements, the Installation Status Report and how they feed into OACSIM's Headquarters Installation Information System. The goal is to provide a central location with all information needed to comply with Executive Order 13514, which requires each agency to implement high-performance, sustainable federal building design, construction, operation and management, maintenance and deconstruction.



An innovative technology, biocidal enzyme-based nanocomposite coating, creates a self-decontaminating surface. Graphic courtesy of ERDC-CERL

CERL's net-zero support includes a project to evaluate waste-to-energy options, such as this conceptual graphic of a rotary kiln waste gasification system now under construction at the Center for Environmental Science and Technology, State University of New York. Graphic courtesy of W2E Ventures Inc.

Fighting corrosion

CERL continues to serve as the Army lead in the DoD Corrosion Prevention and Control program, which is funded by the deputy undersecretary of Defense for acquisition, logistics and technology. Two technologies developed under this program — thermoplastic composite bridges installed at Fort Bragg, N.C., and a carbon nanocoating — received *R&D 100* awards this year from R&D Magazine. The award recognizes the top 100 innovations worldwide. In addition, the composite bridge was selected for one of the *Top Three Editor's Choice* awards.

The lab's corrosion experts also provide critical field support to its customers. In one project for the Department of ➤

Europe District wraps up fiscal 2011

by Rachel Goodspeed

Members of the U.S. Army Corps of Engineers' Europe District said farewell and welcomed two district commanders in less than six months, but that didn't stop them from executing an additional $146.6 million over the previous fiscal year. The Europe District closed the books on fiscal 2011 wrapping up the year with 1,624 actions — roughly $674.2 million worth — in spite of a workforce down 8 percent from the previous fiscal year.

Stepping toward net zero

With 63 projects registered with the U.S. Green Building Council's Leadership in Energy and Environmental Design registry, Europe District is making headway on its LEED program. A $25 million sustainable distribution center in Germersheim, Germany, was turned over to the Defense Logistics Agency in August, and the first low-energy *passivhauser*, or passive houses, were delivered to the Ansbach, Germany, military community in June.

In addition, the district broke ground in November 2010 on the $20 million NATO Special Operations Headquarters in Mons, Belgium, and continues to make headway on the $119 million U.S. Army Europe Mission Control Center in Wiesbaden, Germany. Both projects are slated to meet LEED Silver requirements.

"The passive houses and the distribution center were major steps forward and just a part of our overall goal of constructing our facilities to be more energy efficient and [achieving] the Army's vision of net-zero installations," said James Noble, chief of the district's Engineering Branch.

"The Army implemented LEED standards because they had goals to be more sustainable, to be more energy efficient, use less water and provide a better working environment for the people inside the buildings," said Rich Gifaldi, the district's sustainability engineering manager. "LEED is an efficient tool to be able to measure how well those goals are met."

Shovels await the start of a groundbreaking ceremony Nov. 30, 2010, in Mons, Belgium, to mark the construction start for the $20 million NATO Special Operations Headquarters. Photo by Carol E. Davis

Breaking new ground

Construction of the passive houses was not the district's only first in fiscal 2011. Engineers in Grafenwoehr, Germany, were given the task of repairing two dams in the Army's training area there. While many stateside USACE districts handle water projects, this dam repair work was the first of its kind for the Europe District.

Acronyms and Abbreviations	
DoD	Department of Defense
DoDDS	Department of Defense Dependants Schools
FY	Fiscal Year
LEED	Leadership in Energy and Environmental Design
O&M	operations and maintenance
USACE	U.S. Army Corps of Engineers
WAAF	Wiesbaden Army Airfield

The district also saw an almost 150 percent increase in operations and maintenance work this fiscal year from the U.S. Air Force in Ramstein Germany. Although the requests began in summer 2009, the district's efficiency in project delivery resulted in an exponential increase in O&M contracts.

The district's job order contracts and multiple award task order contracts made it easy to pick up some of the Air Force's excess O&M work when they were oversaturated, said Scott Deetz, resident engineer at the Ramstein Resident Office.

"We provide quality and timeliness," Deetz said. "We also provided turn-key and design."

Building strong around the world

While the majority of the district's workload lies in Military Construction, members also had the opportunity to deliver several goodwill projects in Eastern Europe in partnership with the U.S. European Command and U.S. Agency for International Development.

The Croatian town of Karlovac ➤

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Transportation's Office of the Inspector General, they examined how corrosion may have occurred in 30-year-old steel piles in the Washington, D.C., area's Dulles Corridor Metrorail after decades of exposure to electrical current from the tracks.

This phenomenon — stray current corrosion — can occur when the direct current used in electrified railways strays from its intended path and follows a buried structure like a pipeline or steel pilings. The stray current will flow back to its intended path, but corrosion occurs at the point where it leaves the buried pile. Estimating the steel lost over time due to corrosion is important in projecting how many years of service may be expected from the piles in question.

POC is Dana Finney, 217-373-6714, dana.finney@us.army.mil.

Ilker Adiguzel is the director, ERDC-CERL, Champaign, Ill.

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celebrated the delivery of a special-needs playground in June, and the Armenian towns of Talin and Sasnashen received renovations to a polyclinic and kindergarten, respectively, in September. Estonia's Police and Border Guard Bureau received a helicopter landing pad in October in support of its counter-narcotics and border control operations, and renovations on three hospitals in the Republic of Georgia also began early in the fiscal year.

"These projects are about helping people and their communities," said Wayne Uhl, chief of International Engineering. "While the projects comprise relatively small dollar amounts compared to other construction projects, the payoff comes in the strong partnerships fostered between the U.S. and these countries."

Looking ahead

Although the current economic climate is likely to affect upcoming fiscal years, as with many other Department of Defense agencies, Europe District employees are already tackling the estimated $754 million FY 2012 program.

The district has several larger projects on its plate, including design of the $1.2 billion Kaiserslautern (Germany) Military Community Medical Center, roughly $600 million in constructing and renovating schools for the Department of Defense Dependents Schools-Europe, and $215 million in Wiesbaden transformation projects.

DoD is committed to building and renovating more than 100 DoDDS schools through the 21st Century Education Environment initiative. The district is actively supporting the initiative with five projects soon to begin design, six projects in design, another four under construction and more in the pipeline.

"A recapitalization program of this size is a rare opportunity," said Mike Mollineaux, district DoDDS program manager. "Not only will it improve the functionality and condition of our educational facilities, it will allow for flexible educational environments that are adaptable to future changes in educational philosophy and technique."

Meanwhile, the Wiesbaden community continues to see its own construction boom. In addition to the U.S. Army Europe Mission Control Center, construction is expected to begin on the $91 million Consolidated Intelligence Center, and design is expected to begin on the $30.4 million Network Warfare Center.

Quality-of-life upgrades for the growing military community are also in the works, including the $3.7 million Auto Skills Center and a post exchange and commissary complex. The new Family housing units south of the Wiesbaden Army Airfield, a $133 million project, are expected to be delivered in 2012.

"We've made a lot of progress in the Wiesbaden military community, and there's much more to come," said Jamie McCormick, acting-resident engineer at the WAAF Resident Office. "While the Army continues to modernize its force, we've helped modernize its facilities and support its consolidation efforts."

Further afield, the district's Wye River Memorandum program in Israel had wrapped up in FY 2010, but that didn't stop the country from using the district's foreign military sales program. Today, more than $300 million is projected in current and upcoming projects.

Spc. Kody Hansen, his wife, Mary, and son, David, enter their Urlas passivhauser *quarters during a ribbon-cutting ceremony June 14. Photo by Brian Temple*

U.S. Ambassador James Foley (right) and local special needs children release red balloons to celebrate the opening of a special needs playground in Karlovac, Croatia, June 16. Photo by David Colberg

"These projects help provide the U.S. with an important ally in the Middle East," said Capt. Nathan Davis, deputy area engineer at the district's Israel Area Office. "We have a great relationship with our Israeli partners, and we hope to preserve our relationship by continuing to support critical construction and engineering projects."

Throughout the fiscal year, as district commander Col. D. Peter Helmlinger said, the district's 433 employees — 8 percent fewer than the previous fiscal year — worked hard to prove why Europe District is the organization of choice for its strategic partners.

POC is Rachel Goodspeed, +49 611 9744 2847, rachel.v.goodspeed@usace.army.mil.

Rachel Goodspeed is a public affairs specialist, Europe District, USACE.

Sustainable, energy-efficient communities start with great planning

by Jerry Zekert and Andrea Wohlfeld Kuhn

As 2011 comes to a close, it's clear this was a year of transition. The Army completed most of the Base Realignment and Closure construction, perhaps the largest amount of construction ever achieved. At the same time, 2011 brought to the front the importance of sustainability and energy efficiency in preserving military installation capabilities for future needs.

The Department of Defense and the Army recognize that to achieve these long-term stewardship goals on installations requires sound master planning practices. Creating a comprehensive future vision for installations requires an enterprise approach to planning.

The U.S. Army Corps of Engineers' Master Planning Team serves the Army, the other services and DoD by helping them to embrace the best master planning practices needed to create great sustainable, energy-efficient installations that meet today's missions while positioning themselves to be able to meet unforeseen future military requirements. The team helped create an integrated approach to planning that employs the best planning practices and builds planning competency throughout the Army, the other services and DoD.

In 2011, the Master Planning Team focused on three goals:

- championing best planning practices that ensure the Army and DoD are technical leaders in the practice of sustainable, energy-efficient planning;
- broadening the understanding and knowledge of the professional practice through training, development and outreach; and
- expanding planning support to installations.

Acronyms and Abbreviations	
DoD	Department of Defense
OSD	Office of the Secretary of Defense
USACE	U.S. Army Corps of Engineers

Best planning practices

USACE is considered a champion within DoD in promoting an enterprise approach to planning that integrates energy and sustainability considerations into the planning process while meeting military missions today and tomorrow. The USACE Master Planning Team leads several major technical leadership initiatives.

Andrea Kuhn (standing, center) and Jerry Zekert (standing, right) work with students during a master planning class in Portland. Photo by Jill Schreifer

DoD Master Planning Unified Facility Criteria update – USACE, working with the Office of the Secretary of Defense and all the services, prepared an update to the *DoD Master Planning Unified Facility Criteria*. The update establishes consistent installation planning processes that embrace sustainable, energy-effective development. The USACE team led the multi-service working group that developed a comprehensive document that embraces the best planning practices. The effort is in final staffing and is expected to be approved within the next couple of months.

Enterprise approach to planning and energy guidance – Working closely with the USACE Energy Program manager, the Master Planning Team championed a protocol that ensures energy and net-zero considerations are embedded in the ongoing installation planning processes. The team provided technical advice, concept papers and presentations to various forums.

Sustainable planning and development – The Master Planning Team served as the lead expert in sustainable planning on many multi-functional teams, ensuring sustainable planning practices were integrated as part of the enterprise approach to master planning. For example, a team member served as the master planning subject matter expert on the Army's Sustainable Design and Development Validation Team, participating in corroboration and evaluation of Leadership in Energy and Environmental Design projects and a year-end after-action review.

Building the Master Planning Community of Practice – The USACE Master Planning Team championed the development of the Master Planning Community of Practice. As part of this effort, the team hosted the annual training symposium prior to the Federal Planning Division Workshop in Boston in April. More than 350 people participated.

Technical planning presentations – The master planning team provided many technical planning presentations to Army and DoD leaders, professional organizations and associations, and other stakeholders. These lectures offered insight into various aspects of comprehensive planning. Team members spoke at functions sponsored by the U.S. Green Building Council, the American Planning Association, the OSD Sustaining Military Readiness Conference, the Society of American Military Engineers and the ➤

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USACE senior leader conferences.

Training, development and outreach

USACE raised the bar within the Army and DoD planning community and among associated stakeholders, designers and engineers for understanding the principles of planning. Planning for military installations requires unique skills with a comprehensive, enterprise approach.

Working with the USACE Learning Center, the Master Planning Team created the only American Institute of Certified Planners-accredited educational program in the federal government. The Master Planning Institute program consists of formal classroom training; on-site, hands-on installation planning practicums; and short educational presentations

Master planning courses – Seven classes were offered around the world, and 164 students were trained in 2011. These courses included the Basic and Advanced Master Planning, Historic Structures and Applied Skills classes.

Installation master planning practicums – In 2011, the USACE Master Planning Team, working with Headquarters Installation Management Command and installations, sponsored a series of planning practicums. These training sessions provided broad planning training to the entire installation community. Stakeholders were amazed at what planning can do to make an installation's vision come to life. Seven installation practicums were hosted around the world in 2011, including Fort Hood, Texas, Fort Gordon, Ga., Fort Shafter, Hawaii, and USACE's Cold Regions Research Engineering Laboratory, Hanover, N.H.

Publications and outreach – The USACE Master Planning Team contributed to professional publications, providing insight into installation master planning. Team members wrote a dozen articles for the January/February 2011 Master Planning edition of the Public Works Digest. Throughout the year, members continued to provide articles that discussed the importance of leveraging planning processes in solving tough Public Works issues. A team member co-authored an article that appeared in Live Better eMagazine on sustainable design features at Fort Carson, Colo., and the National Renewable Energy Laboratory.

Technical support to installations

The USACE Master Planning Team worked closely with supporting districts to build regional centers that provide consistent technical planning support to installations. These regional planning production centers institutionalize the ability to provide regional planning support. Each USACE division sponsors at least one planning center.

The Fort Worth District Planning Production Center is a model. This center built robust in-house and contractor capabilities to provide planning support to installations. The Fort Worth team also sponsored a regional conference on sustainability and energy, and worked with other military services on planning support.

The Sacramento District Planning Production Center offers worldwide planning contracting capability that other Regional Planning Production Centers can leverage. This tremendous asset has broadened USACE's planning abilities.

Very good year

In summary, the USACE Master Planning Team led a robust planning program that consistently promoted an enterprise approach for the planning and development of installations. The team built a leading-edge planning expertise that is relied upon by the Army and DoD.

The American Planning Association cited the USACE Master Planning Team with *Honorable Mention for Outstanding Federal Sustainable Planning Project* in 2011. This is the third year the team received an award.

The team's outstanding professional planning education program, accredited by the American Institute of Certified Planners, teaches the best professional planning practices, embracing energy and sustainable development. The classes build the installation planning bench, which helps military installations plan for the future by preserving installation military capacities.

Achieving these capabilities results in the long-term delivery of sustainable, energy-efficient installations for the nation while meeting missions today and tomorrow.

POC is Jerry Zekert, 202-761-7525, jerry.c.zekert@usace.army.mil.

Jerry Zekert is the chief, Master Planning Team, and Andrea Wohlfeld Kuhn is a senior planner, Headquarters, USACE.

Master planning training program honored

The Center for Environmental Innovation and Leadership awarded its 2011 Workforce Development Through Training Award to the U.S. Army Corps of Engineers for its Master Planning Institute training program.

The award will be given during the GOVgreen Conference and Exhibition Dec. 1 in Washington, D.C.

The Corps' robust master planning professional education program provides a broad spectrum of sustainable, energy-efficient planning practices to the entire federal government planning community.

Army Housing fiscal 2011 rewind

by Shenise Foster

Fiscal year 2011 proved to be a productive and groundbreaking year for the Office of the Assistant Chief of Staff for Installation Management's Army Housing Division. The Army Housing Division lived up to the promise of the *Installation Management Campaign Plan* to improve Soldier and Family housing, as well as sustain a multi-skilled workforce with the knowledge, capabilities and innovation to deliver housing products and services.

The Army Housing Division led the way in developing Family housing, barracks and professional development programs that improved the quality of life for Soldiers and Families and will continue to sustain the Army housing culture for many years to come.

Creating the foundation

In FY 2011, Career Program 27 and Civilian Workforce Development teams across the Army came together in response to the 2010 National Defense Authorization Act. The Army's Civilian Workforce Transformation Task Force worked to ensure that 100 percent of Army employees are managed in a career program, regardless of job series — a significant task. Only 40 percent of Army civilians were in a designated career program in FY 2010.

The task force created the Installation Management Career Program 29. CP-27 will remain a separate program dedicated to housing professionals, but the career programs will work together in the coming years.

CP-27 will continue its efforts to include other job series, such as 0300, 0800 and 1100. The goal is to make Army Civilian Training, Education and Development System funding available to more housing personnel, allowing them to become well-rounded careerists.

The Civilian Workforce Transformation Task Force debuted the Army Career Tracker, *https://actnow.army.mil*, a

Shenise Foster
Courtesy photo

leadership development tool that integrates training, formal and informal education paths, and experiential learning gained through assignment and professional history into one personalized and easy-to-use website. ACT will allow users to:

- view all career-related data in one portal;
- receive professional development recommendations from leaders, mentors or supervisors;
- identify the operational, institutional and self-development requirements for advancement; and
- plan new activities designed to reach professional and personal goals.

To provide training on policies, procedures and regulations, the Army Housing Division began developing courses to focus on five core areas: Family housing, general and flag officer quarters, housing services for off-post assistance, Residential Communities Initiative for on-post privatized housing and unaccompanied personnel housing.

Increased knowledge in these areas will enhance the practitioner's ability to offer quality services to Soldiers and Families. Two course levels will be offered for each subject.

This effort aligns CP-27 with the Army Civilian Workforce Transformation initiatives and reduces competency gaps. Courses are expected to be available in 2012.

As part of its on-going support for Housing Services Office employees, the Army Housing Division conducted an HSO training seminar for more than 20 installations in April. This seminar on social media applications, the Automated Housing Referral Network, the rental partnership program and the upcoming HSO certification roll-out, allowed HSO professionals to collaborate and foster an environment of open communication.

Acronyms and Abbreviations	
ACT	Army Career Tracker (website)
AHOUS	Army Housing Online User Services (website)
AHRN	Automated Housing Referral Network
CP-27	Career Program 27, Housing Management
DoD	Department of Defense
FY	fiscal year
HMA	housing market analysis
HSO	Housing Services Office
IMCOM	Installation Management Command
OMA	Operations and Maintenance, Army (funds)
SRM	Sustainment, Restoration and Modernization

Building the structure

Housing market analysis – The Department of Defense relies on the private sector as the primary source for housing for accompanied DoD personnel stationed within the United States. To determine whether the nearby community can accommodate an installation's needs, the military service performs an HMA.

HMAs use a structured analytical process that assesses the suitability and availability of the private sector's rental market against standards for affordability, location, features and physical condition. Results are used to support decisions for construction, renovations, leasing and Army investments in housing privatization projects.

An HMA assesses housing market information and trends at a specific location and compares that data to the installation's total housing requirements. DoD Housing Manuel 4165.63-M provides policy guidance for determining military Family housing ➤

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requirements.

The Army Housing Division, which manages the HMA program, completed a Lean Six Sigma evaluation of the HMA requests. The findings resulted in a cost avoidance of $1,456,442 and a process improvement for HMA requests in FY 2011.

Family housing leasing management – When housing is needed to satisfy a temporary shortfall that the private sector cannot meet, the Army leases Family housing. The leasing program rents, operates and maintains privately owned quarters that are assigned to military Families as government quarters.

In FY 2011, the Army leased nearly 2,200 homes in the United States and more than 6,000 homes in foreign locations. The majority were in Germany, Korea, Italy, the Netherlands and Belgium.

Operations and maintenance – In FY 2011, $287 million was appropriated for Army-owned Family housing operations and maintenance, which funds utilities; housing management; administrative support; services such as street cleaning, snow removal and refuse collection; furnishings; and recurring and major maintenance and repair.

Warrior in Transition barracks at Fort Belvoir, Va., completed during FY 2011 can house 288 Soldiers. Photo by Edward Emden

Permanent Party Barracks Program – In FY 2011, the Permanent Party Barracks Program completed 13 new junior enlisted barracks projects totaling 4,186 spaces in the 1+1 configuration. These accommodations allow Soldiers to have separate sleeping quarters, private baths and kitchenettes. An additional 22 projects were funded to construct 5,275 spaces.

Currently, 95 percent of the required barracks inventory is funded for adequacy. The plan is to bring that to 100 percent by FY 2013.

Three Warrior Transition Unit barracks projects were completed at Forts Belvoir, Va.; Bliss, Texas; and Campbell, Ky.; totaling 728 spaces. Sixteen installations with projects programmed or under construction are scheduled to be completed during FYs 2012-13. They are at Forts Benning, Ga.; Bragg, N.C.; Carson, Colo.; Drum, N.Y.; Hood, Texas.; Knox, Ky.; Leonard Wood, Mo.; Polk, La.; Richardson, Alaska; Sam Houston, Texas; Sill, Okla.; Stewart, Ga.; and Wainwright, Alaska; at Schofield Barracks, Hawaii; and Joint Bases Langley-Eustis, Va.; and Lewis-McChord, Wash. These barracks will be equipped with state-of-the-art accessible furniture, private bathrooms and Internet access.

Training barracks – The Army training barracks buyout remained a top Army priority, which fulfills the Army's commitment to improving all barracks. An aggressive construction and renovation schedule funded with Military Construction, Army and Operations and Maintenance, Army-Sustainment, Restoration and Modernization dollars will complete the program.

In FY 2011, 56 percent — 65,615 spaces — of the training barracks requirements were funded. Another 4,662 spaces will be renovated to adequate standards through the Army's Training Barracks Upgrade Program funded with OMA. The SRM Integrated Programming Team developed a synchronized facilities investment strategy. The team secured funding for training barracks that includes furnishings and other usually OMA-funded features for FYs 2013-15. This success will help relieve Installation Management Command funding shortfalls that, during previous years, came "out of hide" from SRM and OMA funds.

An American Recovery and Reinvestment Act-funded Family housing unit is under construction at Fort McAlester Army Ammunition Plant, Okla. Photo by Richard Smith, project manager

Operational readiness training complexes – This past fiscal year, $96 million was appropriated to support the Army's transient training barracks requirements for the Reserve component and its mobilizing units. These funds will construct a battalion complex at Fort Drum, complete the existing battalion complex at Fort Bliss and construct an enlisted barracks at Fort McCoy, Wisc.

First Sergeants Barracks Program – Centralized management of unaccompanied personnel housing materialized as the First Sergeant's Barracks Initiative, a key component of the Army's *Holistic Barracks Strategic Plan*, in October 2007. The initiative became the First Sergeants Barracks Program, ➤

(continued from previous page)

which became public law in December 2009 and was executed Armywide except for Korea by spring 2011.

The program maximizes barracks use, frees Soldiers' time from nonwarfighting tasks and controls the number of certificates of nonavailability issued, which in turn reduces the number of single Soldiers residing off post and the amount of unprogrammed Basic Allowance for Housing without dependent.

Furnishings – The Army Housing Furnishings Program supplies furnishings for Family housing, barracks and Army lodging. The items include moveable furniture such as case goods, equipment such as appliances and soft goods such as linen, rugs and draperies.

Furnishings authorizations are governed by the Common Tables of Allowances 50-909. These tables are being revised to update furnishings authorizations and will be republished when completed.

The Fort Belvoir Housing Office is conveniently located in the post's Town Center area. Photo courtesy of Army Housing Division

AR 420-1, *Facilities Management*, Chapter 3, requires that all housing furnishings be accounted for and managed using the Enterprise Military Housing system known as eMH. The enormity of the furnishings program makes accountability necessary.

Initial-issue and replacement Family housing furnishings are managed by each installation and purchased with Army Family Housing funds. Unaccompanied personnel housing initial-issue furnishings are centrally funded and managed by IMCOM Housing Branch, and replacement furnishings are funded and managed by the installation.

Sustaining curb appeal

Automated Housing Referral Network – In 2011, the AHRN, found at *www.ahrn.com*, developed and deployed a mobile site for service members and Families with smartphones that gives the option to use AHRN on the go. The mobile-friendly site allows users to search for homes and view pictures, maps and local housing office information. AHRN provides the capability for customers to search on- and off-post rental and military for-sale-by-owner properties Armywide.

eMH – The Army Housing Division upgraded its facilities management operating system from the Housing Operations Management System, HOMES4, to the Navy's eMH structure. The eMH's integrated modules enhance the automation of housing data management processes for unaccompanied personnel, Family, general officer and leased housing.

This system is a secure, proven, government-owned, joint housing application that offers a single sign-on with a common access card. Stateside system deployments were completed in FY 2011. During FY 2012, locations outside the United States will begin to receive eMH. Online training clips are available under the "Housing Training" area on eMH.

Army Housing Online User Services – The AHOUS website, *https://www.housing.army.mil/ah/*, replaced the Army Housing OneStop website in FY 2011. This in-house-managed platform allows Soldiers and Families to view floor plans, pictures and general information about their next duty station. AHOUS is the official website for all single Soldier and Family housing information.

Social media – Army Housing rocketed into the social media realm during FY 2011. A Twitter page, *http://twitter.com/#!/USArmyHousing*, reaches a segment of the Army housing community that was not aware of the programs and services provided. A Facebook page, *http://www.facebook.com/USArmyHousing*, reaches more than 5,000 fans, and that number increases daily.

These avenues allow the Army Housing Division to collaborate with other government organization's social media presences and give Soldiers and Families a reliable contact for their concerns about housing, whether it's on or off the installation.

By creating the foundation, building the structure and sustaining the curb appeal in 2011, the Army Housing Division improved the quality of life for Soldiers, Civilians and Families.

POC is Shenise Foster, 571-256-1292, shenise.foster@us.army.mil.

Shenise Foster is the New Media Program manager, Army Housing Division, Office of the Assistant Chief of Staff for Installation Management. Army Housing Division personnel who contributed to this article are: Elizabeth Liggett, Career and Intern Program manager; Megan Purkey, HSO Program manager; Sandra Randolph, HMA Program manager; Amajtro Peterson, program analyst; Ed Emden, acting chief, Unaccompanied Personnel Housing Requirements and Policy Branch; Gaby Shelley, housing management specialist; and Vernona Aslim, chief, Operations and Management Branch.

Center helps Army achieve sustainability goals

by William D. Goran

The Center for the Advancement of Sustainability Innovations continued last year to help the Army address complex issues involved with national, Department of Defense and other mandates to become sustainable. Created by the U.S. Army Corps of Engineers in 2006, CASI now extends its reach to many areas of sustainability across DoD. This summary provides a snapshot of a few of the center's activities in fiscal year 2011.

Sustainability planning

CASI helped update the USACE Sustainability Plan. The center also wrote a Greenhouse Gas Inventory Management Plan to guide the process of conducting the inventory of GHG emissions at USACE facilities and projects.

To facilitate the inventory, CASI developed a simplified GHG data collection tool, based on the Federal Energy Management Program's GHG reporting tool, for major subordinate command and district project managers to enter data. The tool is called the Corps of Engineers Reduced and Abridged FEMP Tool, or CRAFT.

CASI provided webinar training for CRAFT, collected additional inventory data elements not covered in CRAFT and developed a central data repository to allow inventory data archiving and retrieval for analysis. The tool was updated in late fiscal 2011 to a web-based system that ensures better data entry integrity and quality control as well as a database storage system that supports data visualization software and links to the federal government's Facility Energy Management system.

The center also supported others in sustainability planning, including the Army Materiel Command and the Installation Management Command's Strategy Division. In addition, CASI worked with Fort Leonard Wood, Mo., to develop a 25-year integrated strategic sustainability plan that will incorporate long-term sustainability into all operations and activities at the fort. The plan was web-enabled on the Engineering Knowledge Online portal to help Fort Leonard Wood manage actions coming out of the effort.

Acronyms and Abbreviations	
CASI	Center for the Application of Sustainable Innovations
DoD	Department of Defense
FEMP	Federal Energy Management Program
GHG	greenhouse gas
USACE	U.S. Army Corps of Engineers

Medic training at Fort Greeley, Alaska, depends on frozen ground to provide a realistic experience, but the number of days suitable for this training is being affected by climate change. Photo by Airman 1st Class Christopher Gross

Climate change

The Army recognizes that projected climate changes will impact installations, operations and mission globally. Requirements for climate change vulnerability assessment and adaptation planning are in a DoD instruction, Executive Order 13514 and the 2010 Quadrennial Defense Review.

At the request of the assistant secretary of the Army for installations, energy and environment, CASI is developing a comprehensive planning and assessment framework consistent with national and DoD requirements and guidance. This framework will include a high level identification of the vulnerabilities of military operations, facilities and lands, and it will be guided by stakeholders from assistant secretary's office, Army staff elements, Army commands, installations and others. This vulnerability assessment will use data from iterations of the National Climate Assessment of the U.S. Global Change Research Program Office.

Rare earth minerals

An emerging critical issue is a growing dependence on rare earth minerals essential for a diverse and expanding array of high-technology military applications, such as jet fighter engines, other aircraft components, missile guidance systems, electronic countermeasures, underwater mine detection, antimissile defense, range finding and space-based satellite power and communication systems. Rare earth minerals are also important in wind turbines and solar cells.

Concerns have arisen about the importance of these minerals to technology, because China mines 95 percent of the world's supply. The effects that nondomestic sources may have on supply and demand of these minerals needed to be better understood and integrated into Army investment decisions, because they will affect the Army's ability to execute mid- and long-term missions.

To address this issue, a team composed of CASI, the NASA's Sustainability Office and the United Kingdom Ministry of Defense's Sustainable Acquisition Team took a broad, strategic and forward-minded look at evolving conditions and explored the investments most critical to address. The study, funded by the Army Environmental Policy Institute, provided recommendations for the Army to consider in weighing possible actions to protect its critical missions and activities.

POC is William Goran, 217-373-6735, william.d.goran@us.army.mil.

William D. Goran is the director, CASI, and a technical director for special projects, U.S. Army Construction Engineering Research Laboratory, Engineer Research and Development Center.

Corps' Environmental Community of Practice 2011 report

by Candice Walters

For the U.S. Army Corps of Engineers Environmental Community of Practice professionals, 2011 was a year of not only meeting its execution goals but, in several program areas, exceeding them. Thus, it could be called the year of soaring to new heights.

"This has been a year of unprecedented work in our environmental programs, with several mission areas receiving more money to execute than originally expected," said Christine Godfrey, acting chief, Environmental Community of Practice. "As the nation's environmental engineers, we are engaged and, indeed, building a strong, sustainable environment for future generations."

In fiscal year 2011, the Environmental Community of Practice executed a $1.6 billion reimbursable workload, which included:

- $291 million in environmental quality work — $81 million more than anticipated at the beginning of the fiscal year;
- $363 million in Defense Environmental Restoration Program work at active installations — $63 million more than expected;
- $312 million in the Superfund support to the Environmental Protection Agency — almost $50 million more than anticipated; and
- more than $456.5 million in the Formerly Used Defense sites program, the most ever in the program's history.

In addition, USACE environmental professionals executed $122 million in environmental work through the Civil Works Formerly Utilized Sites Remedial Action Program and $109 million in nonenvironmental Military Munitions Support Services work.

Across the board, the Environmental Program finished the year with almost $300 million more work in FUDS, EQ, DERP and EPA Superfund than had been anticipated at the beginning of the fiscal year.

"The extra money came to us because others within the federal government know that USACE has the professionals who can turn it around and obligate in a timely manner," Godfrey said. "It's a testament to the hard work and dedication to excellence demonstrated by each and every one within our environmental community.

"You've heard the expression, 'You win with people.' When it comes to the USACE environmental programs, it's absolutely true," Godfrey added.

The FUDS program led the way in obligating extra money. Although originally expecting just about $277 million in its FY 2011 funding, it ended up receiving 50 percent more funds than anticipated — an additional $39 million in a congressional plus-up and $141 million in Army reprogrammed funds, both of which came to the program late in the third quarter to obligate.

"This was a massive effort for everyone in a very short time," said Julian Chu, FUDS national program manager. "None of this could have happened without extraordinary commitment and very hard work. It is the dedication to excellence by every member of the FUDS team that makes the FUDS program one of the best managed programs in USACE."

The low temperature thermal desorption unit at the Cornell-Dubilier Electronics site in South Plainfield, N.J., heats the soil, evaporating hazardous substances and converting them into solids that are disposed in a hazardous waste landfill. Courtesy photo

Acronyms and Abbreviations	
DERP	Defense Environmental Restoration
DoD	Department of Defense
DoE	Department of Energy
EPA	Environmental Protection Agency
EQ	Environmental Quality (Program)
FUDS	Formerly Used Defense Site
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
USACE	U.S. Army Corps of Engineers

In addition to achieving a 100 percent obligation rate, the FUDS program took significant steps toward using innovative technologies as well as green and sustainable remediation at more than 30 project sites in the fiscal year to fulfill DoD's cleanup objective more efficiently and economically, Chu added.

The Superfund program continued its growth trend in support of EPA for a second consecutive year with contract obligations standing at $312 million and 107 percent. During the year, the Superfund program also continued work on projects that had received additional funding in FYs 2009 and 2010 under the American Recovery and Reinvestment Act, enhancing efforts to stimulate the nation's economy.

EPA and New York District used $30 million in ARRA funding for the Cornell-Dubilier Electronic Superfund Project, South Plainfield, N.J., to accelerate the cleanup of contaminated soil and debris. This successful project achieved the ranking of No. 7 in the September 2010 White House report *100 Recovery Act Projects that are Changing America*.

The EQ team — which focuses on compliance, conservation, pollution ➤

Louisville District's Army Reserve furniture team has best year yet

by Jon Fleshman

The Army Reserve Support Team's customer-focused furniture squad had a championship season in fiscal 2011 by racking up a record number of contract awards with the highest dollar value since the program began in 1997. The team is part of the Army Reserve Support Branch of the U.S. Army Corps of Engineers' Louisville District.

The team awarded contracts for 51 furniture projects worth close to $36 million between Oct. 1, 2010 and Sept. 30, 2011, according to Joe Gates, chief of the Special Programs Section of the Army Reserve Support Branch.

"The key to their success is a process that goes far beyond the simple purchase of furniture," Gates said. "It includes getting the best value from an array of suppliers, closely coordinating and managing the timing of delivery and installation to ensure uninterrupted progress toward overall project completion that is integrated into the construction contract, working the punch list to quickly resolve furniture package deficiencies and actively involving the customer and vendor in final inspections."

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
FY	fiscal year

Bob Harris, the team's project engineer and unofficial historian, has been with the program from the beginning when the Reserve Support Branch furniture team comprised only himself and Gates, with support from Engineering, Contracting, Construction and Resource Management divisions. The recent rise in numbers reflects the team's successful support of the Louisville District's Base ➤

While vendor representative Bob Manley (right) checks the work-station assembly, Corps of Engineers furniture team post-award manager Brandon Meyer (left) and Sgt. 1st Class Valarie Jackson inspect parts for the furniture being installed in her Fort Knox, Ky. Office. Photo by Jon Fleshman

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prevention and integrating natural resource laws, values and sound environmental practices at Department of Defense facilities — executed 38 percent more work this year than was anticipated. Expecting to receive $210 million, the program received an added $81 million due to a large amount of Air Force work and unanticipated work for the Army.

Receiving and executing more than $30 million in FY 2011 was the USACE Environmental Support for Others program, which provides environmental services to non-DoD federal agencies that do not have the in-house capability to meet their own environmental requirements. About $20 million of the funding received went to support the Department of Energy, with Huntington District overseeing those efforts. Huntington District worked on projects at DoE's Savannah River, S.C., West Valley, N.Y., Oak Ridge, Tenn., and Los Alamos, N.M., sites, all of which involved looking at the sites' Base Capital Asset Cleanup Projects.

Under an interagency agreement with the DoE's Office of Environmental Management, Huntington District provided project controls support on cost estimating, contractor's performance reporting, scheduling, risk management and baseline change control for the Savannah River Base Capital Asset Cleanup Projects.

Huntington District also brokered work for Omaha and Pittsburgh districts and the Environmental and Munitions Center of Expertise through an agreement between USACE and DoE's National Energy Technology Laboratory to provide engineering services, construction management, economic modeling and other technical support. Two projects were completed in FY 2011, and three more are under way.

The FUSRAP team achieved a number of milestones in FY 2011:

- completing two feasibility studies at Iowa Army Ammunition Plant and DuPont Chambers Works;
- completing three records of decision at the W.R. Grace Radioactive Waste Disposal Area, Iowa Army Ammunition Plant and Harshaw Chemical Company Investigative Area-6; and
- removing and properly disposing of about 129,300 cubic yards of contaminated material throughout the program.

In addition, St. Louis District returned 18 properties to beneficial use.

This past year also saw the first ever USACE Sustainability Awards Program, six awards designed to identify the great work USACE employees are doing in the sustainability arena in support of the Corps and its customers. The award winners are examples of how USACE is using innovation, dedication and hard work to balance mission requirements with sustainability responsibilities. USACE also submitted 13 projects to be considered for the 2011 *GreenGov Presidential Awards*.

POC is Candice Walters, 202-528-4285, candice.s.walters@usace.army.mil.

Candice Walters is a public affairs specialist, Headquarters, U.S. Army Corps of Engineers.

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Realignment and Closure mission that began in FY 2008. That year, seven BRAC furniture projects were awarded; then nine the following year, 25 in FY 2010 and 32 in FY 2011, which was almost 63 percent of the total furniture contracts awarded.

"The normal Army Reserve training center package consists of furnishings from 10 to 14 vendors for a total from $400,000 to $800,000," Harris said. "The value of furniture packages for many of the larger armed forces reserve centers constructed for BRAC was well over $1 million dollars."

The largest package was almost $4.7 million for the Moffett Field, Calif., Regional Support Command headquarters.

"The strength of this team lies in its dedication to providing the Soldier with the highest quality of service and furniture that will allow them to complete their mission," said Tony Yeldell, chief of Construction, Army Reserve Installation Management Directorate. "All of this work is done with relatively few errors and has not impacted the scheduled delivery of any project."

In the past, a new building's furniture wouldn't show up for three to six months, Gates said. When it did, troops off-loaded the trucks and put together the work stations. The Army wanted a turnkey program that took care of design, ordering, installation, punch list and warranty requirements.

Quality was also an issue. As mandated by Congress, all furniture came from the Federal Prison Industries, known as UNICOR, Harris explained. When Congress considered doing away with the furniture monopoly, UNICOR became amenable to upgrading its operation, and now, the district has a solid relationship with UNICOR.

"Product and service both greatly improved in the area of design as well as the furniture itself," said Barbara Pfister, the team project manager

In recent years, the high volume and tight deadlines of BRAC projects brought their own challenges to the team's interior designers who perform technical reviews, Pfister said.

Interior designer Radka Lindquist stressed the importance of communicating the Army Reserve requirements to the architect-engineer community by providing the latest standards and guidance throughout the design phase.

"I also perform technical reviews to make sure all the furniture is accounted for, scrutinize drawings to ensure furniture, electrical and telecommunications plans are compatible, and compile price quotes and quantities for the project engineer to take to Contracting," Lindquist said.

"The biggest challenge for Contracting is the sheer volume of purchases and the frequent modifications due to schedule slips during construction," said Lisa Bisig, who heads the Servicing Section of Contracting. "It's common for Contracting to have more than 50 furniture-related actions to process at any given time."

Once the contracts have been awarded, post-award managers like Shanna Miller move front and center to tackle the administrative details. Miller's duties include the pre-installation furniture portion of the Red Zone meeting, held when the project is within 80 percent of completion; tracking and dealing with schedule issues; assisting with small business coordination and quality control for database information input; handling issues during installation; following up on corrective actions; and coordinating furniture close-out. She also serves as the liaison among the furniture team, the installers, the district's Construction Management Office, the geographic construction project engineer and the general contractor.

To deal with more than 500 contract actions in FY 2011 — an average of 10 per project — the furniture team developed a delivery process and a culture of sharing and support. At the weekly team meeting, for example, members review detailed, color-coded progress reports from the Army Reserve Support Furniture Database, known as ARSFuD, that was the brainstorm of team member Brandon Meyer.

"I created the installation progress report to give us a snapshot look at projects starting installation within the last 60 days, as well as a look-ahead to those remaining in the current fiscal year and those for the next FY," explained Meyer.

Other key procurement process initiatives include:

- a furniture advisory committee with representatives from the Army Reserves, the Corps and interior designers from industry;
- the Army Reserve Design Guide;
- a comprehensive interior design requirements document;
- the lead vendor responsibility for the entire furniture package;
- the pre-installation part of the Red Zone construction meeting; and
- a formal punch inspection with details of deficiencies and required corrective actions.

POC is Jon Fleshman, 502-315-7475, jon.fleshman@usace.army.mil.

Jon Fleshman is a public affairs specialist, Louisville District, U.S. Army Corps of Engineers.

Public Works Technical Bulletins: 2011 in review

by Dana Finney

During fiscal year 2011, the Army Corps of Engineers continued to provide directors of Public Works and Corps districts with useful, hands-on guidance, assistance and technology tips by releasing Public Works Technical Bulletins. Since last year's summary, 15 new PWTBs have been published. The latest PWTBs tackle environmental issues such as the ecological effects of renewable energy projects, the advantages of composting at explosives contaminated sites and help with managing winter annual grasses.

The PWTBs can be downloaded from the Whole Building Design Guide website. Navigate to this site easily through either the Construction Engineering Research Laboratory website or Engineering Knowledge Online's public pages: *http://www.cecer.army.mil* (middle of page) and *https://eko.usace.army.mil* (on right).

PWTB 200-1-87, ***Operation and Maintenance for Central Vehicle Wash Facilities***, provides a general reference for operation and maintenance of CVWFs designed according to guidance in Unified Facilities Criteria 4-214-03. The PWTB also has information useful for preparing the statement of work for a CVWF operation contract.

PWTB 200-1-88, ***Guidelines for Management of Winter Annual Grasses***, provides a comprehensive list of winter annual grass species occurring in the United States, both native and introduced, along with their common distribution. The PWTB also describes management practices to control these species and includes a key for identifying which grasses are present.

PWTB 200-1-89, ***Integrating NEPA Analysis into Army Non-Native Invasive Plant Management***, demonstrates ways for Army personnel to incorporate National Environmental Policy Act analysis into both integrated pest management plans and nonnative invasive plant species management plans. The information will help installations to comply with NEPA requirements for managing nonnative invasive species.

Acronyms and Abbreviations	
CVWF	central vehicle wash facility
NEPA	National Environmental Policy Act
PWTB	Public Works Technical Bulletin

PWTB 200-1-90, ***Guidance on Native Plant Species Suitable for Ecological Restoration***, lists native plant species that can be used to restore military lands. The use of native species for restoration and other ecological and land management purposes provides numerous advantages contributing to ecological sustainability. *(See page 41.)*

PWTB 200-1-91, ***Management Guidance for Gopher Tortoise Relocation***, addresses concerns developed through the experience of state wildlife agencies, university studies in veterinary medicine, investigations performed by Army research organizations and recommendations contained in the interagency candidate conservation agreement for the eastern population of the gopher tortoise (*Gopherus polyphemus*) signed by the Army in 2009. *(See page 40.)*

PWTB 200-1-92, ***Guidance and Demonstration of Motion Detection Systems for Monitoring Species of Concern***, describes the use and effectiveness of using motion detection cameras to monitor animal species of concern on military installations and Corps of Engineers facilities in the United States. Natural resource managers can weigh the pros and cons of installing this non-invasive technology to survey these species.

PWTB 200-1-93, ***Ecological Guidance for Renewable Energy Projects***, transmits information on factors affecting adoption of renewable technologies to replace or supplement current nonrenewable energy sources. Considerations include current and potential future mission use and requirements, fiscal and other costs for energy infrastructures, and available technologies. *(See page 40.)*

One PWTB identifies invasive species of concern on training ranges, like the prickly diffuse knapweed. Photo courtesy of U.S. Department of Agriculture Archive Bugwood.org

PWTB 200-1-94, ***Army Water Conservation Collaboration Web Portal***, offers information for accessing and using the Water Management Toolbox. The website is *www.water-management-toolbox.com*.

PWTB 200-1-95, ***Soil Composting for Explosives Remediation: Case Studies and Lessons Learned***, discusses the advantages of using composting as a remediation technique at several Army cleanup sites that have soils contaminated with explosives and nitroaromatic materials. Composting is a cost-effective alternative to incineration.

PWTB 200-1-96, ***Initiating Regional Smart-Growth Strategies***, facilitates collaboration between Army installation personal and nonmilitary regional stakeholders to promote smart-growth initiatives. It can help in meeting the goals of Executive Order 13514 to satisfy mission requirements while maintaining a safe, healthy and high-quality environment for current and future generations.

PWTB 200-1-97, ***Evaluation of Check Dam Systems for Erosion and Sediment Control at Military Facilities***, transmits information and guidance for selecting and using check dam structures to control erosion on training lands. The PWTB will help land managers avoid product failure due to misapplication.

PWTB 200-1-98, ***Guidance to Improve Archaeological Interpretation of Soils***, provides basic guidance for Army cultural resource managers and their consultants ➤

Fort McCoy breaks ground for $6.8 million barracks project

by Geneve N. Mankel

Installation leadership and civilian contractors donned hard hats and used golden shovels at Fort McCoy, Wis., Sept. 28 to break ground for construction of the Annual Training/Mobilization barracks.

"This is a historic event," said Darrell Neitzel, Fort McCoy's director of Public Works. "This is the first permanent Soldier training barracks that has been built at Fort McCoy, ever."

The Army Corp of Engineers Fort McCoy project office will oversee the project. Four Bears/TCI Joint Venture is the contractor for this $6.8 million design-build project. Completion is expected by Oct. 1, 2012.

Fort McCoy's senior commander, Maj. Gen. Glenn J. Lesniak, emphasized the historical significance of the event in his remarks at the ceremony.

"The landmark look that you see at Fort McCoy was originated in 1942," Lesniak said. "More than 1,500 facilities were built to support operations for about five years. Today, 272 of those facilities are still in use as barracks."

The AT/MOB barracks design is adapted from the design that active-duty installations use, replicating a housing complex environment with laundry and other facilities. The two-story structure will house 168 personnel.

"The landmark look will be replaced with the look of the AT/MOB facility," Lesniak said.

The facility is Silver certified Leadership in Energy and Environmental Design, a green building certification system that takes into account the building site's sustainability and regional priority, the building's water efficiency and energy use, the materials and resources used to construct the building, its innovation in design and its indoor environmental quality.

Construction crews work on the AT/MOB facility. Photo by Tom Michele

"It's a step toward modernizing Fort McCoy so it can be in service for the next 100 years," Lesniak said.

Modernizing Fort McCoy is an ongoing process that has included more than $98 million in renovation projects from fiscal years 2008 to 2011, according to the DPW Master Planning Division.

Acronyms and Abbreviations	
AT/MOB	Annual Training/Mobilization
DPW	Directorate of Public Works

DPW, with support from the post, congressional leaders and local communities, has done a tremendous job with the renovations and upgrades at Fort McCoy, Lesniak said. A testament to the outstanding upgraded facilities at Fort McCoy was given by the commander of the last unit to mobilize at Fort McCoy.

"He said this is the best site he has ever mobilized from and gave Fort McCoy a number of other compliments about the services and facilities," Lesniak said.

Following his remarks, Lesniak, along with Fort McCoy's garrison commander, Col. David E. Chesser; the U.S. Army Corp of Engineers's project engineer, Roy E. Brewer; Four Bears Construction Inc. representative Elmer L. Hanson; and TCI Architects/Engineers/Contractor Inc. representative Darell S. Harlin broke ground at the construction site.

POC is Lou Ann M. Mittelstaedt, Public Affairs Office, Fort McCoy, 608-388-2769, DSN 280-2769, louann.m.mittelstaedtciv@mail.mil.

Geneve N. Mankel is a staff member, Public Affairs Office, Fort McCoy. This article is adapted from the The Real McCoy.

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on how to recognize and interpret soils in archaeological contexts. Doing so helps in making informed and proper management decisions about land use.

PWTB 200-1-99, ***Development and Evaluation of Compost Mulch Best Management Practices for Erosion Control***, describes mulching with compost as a cost-effective method of erosion control on military lands. Composted byproducts, such as wood fiber mulch, can help control erosion and establish vegetation while reducing landfill waste and impacts to water quality.

PWTB 200-1-100, ***Selection of Reinforced Vegetation and Hard Armoring Techniques***, serves as a primer to help Army personnel identify and understand the technologies and materials available, and the basic engineering concepts behind, steep slope stabilization and erosion control to support military activities.

PWTB 200-1-102, ***Twenty Non-Native Invasive Plants Army Installation Land Managers Should Know About***, provides an overview of 20 invasive weed species that occur on Army installations in the continental United States. The PWTB presents information for each species as an illustrated fact sheet that covers plant biology, control and management, and impacts on the Army mission.

POC is Malcolm McLeod, 202-761-0632, malcolm.e.mcleod@usace.army.mil.

Dana Finney is a public affairs specialist, Construction Engineering Research Laboratory, U.S. Army Engineer Research and Development Center.

Fort Wainwright real property team achieves impossible

by Kate Siftar

For the real property staff at Fort Wainwright, Alaska, the Department of the Army's commitment to 100 percent compliance with the Chief Financial Officers Act of 1990 presented a whole new meaning. Every one of the more than 2,000 assets in the installation's real property inventory needed a folder containing all related cost documentation no later than the last day of September.

An Office of the Assistant Chief of Staff for Installation Management two-week, pre-audit site-assistance visit in May 2010 identified the need for the folders. The challenge was building the folders for the 2,000-plus assets. Like many other Army installations, Fort Wainwright has too few real property specialists to properly and proactively manage its real property inventory, but the real property staff took on the challenge to comply with the CFOA requirements and meet the seemingly impossible deadline.

A team of engineers, planners, realty specialists, administrative assistants and real property specialists was formed to focus on the goal. The team worked like an assembly line. Each person's capability was used to the maximum and contributed to a final compliant folder.

An administrative assistant purchased and labeled folders. A real property specialist printed out Integrated Facilities System cost detail sheets. An engineer estimated costs. A realty specialist located leases and easements. A planner validated units of measure, and it went on and on. Instead of enjoying the long days of interior Alaska summers fishing, gardening or just relaxing in the sun, they filed constantly, every day, all day.

The team overcame many obstacles. The biggest problem was missing cost documentation for many assets. The reasons were varied and wild — the records were shredded by mistake; the records were thrown out during an office move; the records were never given to Real Property; or the records were destroyed after retaining for their mandatory timeframe, which, unfortunately, did not match the CFOA requirement.

If the cost documentation could not be located, an attestation memorandum had to be created and signed by the director of Resource Management and the real property accountable officer. They are both now very familiar with attestation memos.

The *Real Property Audit Preparation Handbook* served as an invaluable reference. Newsletters from the Programming Administration and Execution System, known as PAX, were a great cost-estimating resource. The newsletters list unit costs for many Army facilities and state area cost factors.

The team's efforts are now focused on developing a sustainable process to preserve the accuracy and completeness of Fort Wainwright's real property inventory to meet the expectations of various levels of audits, which will continue until 2017. The 2010 National Defense Authorization Act requires that financial statements are validated as ready for audit by Sept. 30, 2017.

Fort Wainwright Internal Review has been appointed as Installation Management Command's liaison support and the point of contact for the Army's audit readiness efforts. Internal Review is mandated to report any issues and oversee the audit readiness on a quarterly basis. Reports were submitted in August and November.

An audit is never an enjoyable experience and usually has a negative impact on morale. Auditors are rarely real property experts, and their solutions do not always make sense to subject matter experts. However, one thing that the Fort Wainwright team members can agree on as a benefit of the past year's audit preparations is that they learned the importance of an internal control program.

Dave Sanches (left), a planner, Anne Chemi (center) and Vickie Tallman, both real property specialists — three of the Fort Wainwright team's key members — build real property folders. Photos by Kate Siftar

Completed folders rest in a file drawer at Fort Wainwright.

The team members can now articulate solutions. They gained a better understanding of controls needed. They will be more effective and motivated to improve the installation's asset management process with a sustainable program.

POC is Kate Siftar, 907-377-3315, kate.siftar@us.army.mil.

Kate Siftar is the chief, Master Planning Division, U.S. Army Garrison Fort Wainwright.

Acronyms and Abbreviations	
CFOA	Chief Financial Officers Act

Fort Sill goes off-road with PT

by Kevin L. Jackson

In October, Fort Sill, Okla., completed a first-of-its kind project. A 15-foot-wide, almost one-mile-long asphalt running trail — built for Soldiers and on which vehicles are prohibited — was completed to help address the need for safe physical training facilities.

The challenge

Every morning, more than 21,000 Soldiers rise before the sun to perform PT at Fort Sill. The Soldiers gather with their units on ball fields, the front yards of their headquarters or wherever they can find grass and do calisthenics. And they run. Roughly nine miles of cantonment roads are blocked from about 5:30 to 7:30 a.m. for Soldiers to run.

When these roads are blocked, the facilities along them are, for the most part, inaccessible. These facilities include unit headquarters, motor pool entrances, two dining facilities, a fire department, a wastewater treatment plant, a gymnasium and two water towers.

Not all Soldiers run on the blocked streets, which further compounds the situation. The wave of Civilian vehicles driving to work on Fort Sill crests between 7 and 7:30 a.m., conflicting with those Soldiers running on the sides of roads.

During the winter months, when the morning temperatures are bitter cold in southwest Oklahoma, PT is moved to the afternoon. The dangerous part of that timeframe is that the roads cannot be blocked, and all of the Soldiers run on the sides of busy roads.

Soldiers doing PT compete with vehicles for road space on Fort Sill. Photo by Kevin L. Jackson

The 2005 Base Realignment and Closure law brought the 31st Air Defense Artillery Brigade from Fort Bliss, Texas, to Fort Sill, adding 1,500 Soldiers to the post population. The brigade complex is located on the south side of one of Fort Sill's arterial roads, which is busy with construction projects and serves as the portal to the towns of Lawton and Cache where the majority of Fort Sill Civilians and military reside.

Units headquartered on the north side of the road, directly across from the 31st's complex, block several roads in the mornings for their PT. Wisely, the 31st's leadership did not want their 1,500 Soldiers crossing a very busy road twice every morning to run on roads that were already congested with other Soldiers.

"The location of our brigade required us to cross a main traffic artery here on Fort Sill," said Lt. Col. Ronald B. Hildner, deputy commander, 31st Air Defense Artillery. "It was a safety issue."

The 31st's leadership approached the Directorate of Public Works' Master Planning Division and requested that a route be found or developed to South Boundary Road on which vehicular traffic is rare. Once on the road, the Soldiers could run safely for miles.

The design

DPW master planners knew that, like designing a highway, the expected user population would dictate the width of the trail. The planners visited the 31st and other units, asked questions and observed.

If space was not a hindrance, how wide would the units prefer their running formations to be? The perfect formation, they learned, was four Soldiers wide with a leader running alongside.

Planners saw that, when units did run in such formation, they used the entire 12-foot-wide road lane. Planners estimated that each Soldier took up about 2½ feet, so five Soldiers across would need 12½ feet.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
DPW	Directorate of Public Works
PT	physical training

But what would happen, the planners asked, if a formation was approached by another similar formation coming in the other direction? Should the trail be 25-feet wide? They decided that scenario would be rare, but the approach of a single runner would be more common. Planners calculated that an additional 2½ feet should be added to allow for an individual runner to pass the formation and agreed on a 15-foot width.

As planners developed the design, some on Fort Sill argued against building a running trail. After all, PT had always been run on post roads with cars driving past. It worked. Why the need for change?

Some research demonstrated the need. The distractions a driver faced in operating a vehicle even just 10 years ago pale in comparison to what the average driver faces today. Drivers eat and drink while driving. They adjust the radio, the CD or the GPS. They worry about personal problems or try to stay awake. In addition to these more routine distractions, add the cell phone.

In 2000, there were 97 million wireless subscribers, but by 2009, there were 276.6 million, according to CTIA–The Wireless Association. With cell phone use comes text messaging, adding a behemoth distraction to drivers. In 2000, 12.2 million text messages were sent monthly. By 2009, that number had grown to 135.2 billion.

A detailed study from Monash University on the effects of text messaging while driving revealed that, when retrieving and sending text messages, the amount of time drivers spent with their eyes off the road increased by 400 percent, the ➤

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number of incorrect lane changes increased by 140 percent and vehicle speed increased.

The National Highway Traffic Safety Administration reports that every 24 seconds, an accident involving drivers using cell phones and texting occurs in America. In 2009, cell phones were reported as a distraction for 20 percent of the drivers in fatal crashes.

The project

Thanks to funding from the 31st Air Defense Artillery Brigade, construction began in December 2010. Now that the trail is completed, Soldiers are using it.

No roads have to be shut down. No Soldier has to cross a busy road or run beside traffic. Soldiers can run the trail anytime without worrying about their safety.

Several key people from the installation worked with brigade leaders for two years to ensure Soldiers got what they needed and are kept safe at the same time, Hildner said.

"The construction of this trail reduces the danger to Soldiers running in the morning from traffic and increases traffic flow on the road due to fewer runners crossing it," he said. "It is a win-win for both the brigade Soldiers and those trying to get on post in the morning."

The trail also serves bicyclists. Fort Sill's planners want to provide safe routes for bicycles as well and believe trails like this one can be used very safely by runners and bicyclists simultaneously.

Future plans

Fort Sill DPW master planners envision a network of these off-road trails meandering throughout post like a spider web. The trails will be wide, lighted and a comfortable distance from traffic, so whether a Soldier is running or a Family from the housing area is taking a relaxing bicycle ride, users will be able to access the trail almost anywhere on Fort Sill, even after the sun goes down, without the worry of a vehicle coming up behind them.

Seven planning tools will be used to obtain this goal.

- ***Flood plains*** – More than 9,100 acres of 100-year flood plain acreage that does not allow building construction exist on Fort Sill. The Master Planning Division sees great potential in placing wide, lighted trails in these areas, which are usually thick with trees that will make trail use more enjoyable during summer when they provide shade.
- ***Green space*** – Where there is not a designated flood plain, planners will set aside green space for trails to continue onward. This practice may involve demolishing old buildings or relooking at how certain areas of post are designed in the future. A side benefit is that green space provides more permeable space within the cantonment area for storm-water runoff, reducing road deterioration and dangerous driving conditions.
- ***Road corridors*** – Planners are looking at placing wider sidewalks on both sides of roads that will undergo widening, with trees separating the vehicular traffic from the sidewalks. Though a 15-foot-wide sidewalk would be preferred, especially along arterials, space and funding may limit the width of the sidewalks, but a minimum of 10 feet will be considered.
- ***Pedestrian bridges*** – Where there are wide arterials with higher speed limits, the solution is to construct a pedestrian bridge. With this tool, both vehicular and pedestrian traffic never meet, and the steady flow of each is never impeded.
- ***Power line easements*** – Large power poles with electrical lines high above the ground were constructed to support the electrical needs of the BRAC projects. The electric company does not allow building construction within the easement of these lines, but trails are permitted.
- ***Anti-terrorism and force protection setbacks*** – Buildings are required to be set back a certain number of feet from the curb depending on the population of a building. Planners will use this space to place trails where possible and where access to the building is not impeded.
- ***Helicopter landing pads and airport runway approach zones*** – Within a certain number of feet from the helicopter landing pad at Fort Sill's Reynolds Army Hospital and even a longer distance on both ends of the runway at Fort Sill's Henry Post Airfield, approach zones exist where no buildings can be built. Trails can be constructed in these very large unused areas.

Workers build Fort Sill's running and biking trail. Photo by Clarence Pierce III

Added benefit

With the increase of safe trails throughout Fort Sill, the DPW will provide a tremendous quality-of-life element for military Families. It is hoped that more people will walk and ride bicycles to their destination, reducing some of the traffic on roads, which will result in longer lasting roads and fewer road maintenance costs.

POC is Kevin L. Jackson, 580-442-4485, kevin.l.jackson146.civ@mail.mil.

Kevin L. Jackson, RLA, is a senior planner and landscape architect, Master Planning Division, DPW, Fort Sill.

Fort Hood uses nonpotable water for golf course

by Christine Luciano

With Texas facing constraints on its water supplies and a statewide drought, Fort Hood's Directorate of Public Works and Directorate of Family and Morale, Welfare and Recreation are working together on an alternative for the installation's golf course irrigation system.

The 27-hole golf complex uses potable water to refill its irrigation pond and water the course, but that situation is about to change. Fort Hood's newest water conservation effort, a system that pumps nonpotable water from a small lake near the golf complex into the golf course's irrigation pond, is now in the test phase.

In fiscal year 2009, the golf course's water consumption was metered as required by the Army, and the bill increased from $100,000 to $340,000 annually. Executive Order 13423, *Strengthening Federal Environmental, Energy and Transportation Management*, also mandated a 2 percent per year reduction in potable water use along with Army and installation sustainability initiatives.

"From a business perspective, DFMWR could not overcome the added cost and was looking for affordable alternatives," said Michael Ernst, chief, Business Division, DFMWR. "Instead of using drinkable, potable water out of a tap, we looked at options to use reclaimed water. It's good for business and the environment."

In 2009, the Construction Engineering Research Laboratory conducted a feasibility study to identify alternatives for a nonpotable source.

"CERL looked at several alternatives including building storm-water retention golf ponds, pumping water from Copperas Cove and then identifying nearby lakes that could be used," said Randy Doyle, supervisor, Environmental Support Team, DPW. "The most feasible alternative was to bring water in from a nearby lake, which was two miles away."

The lake is within the cantonment and is one of the storm-water retention ponds for the motor pools on the installation's east side. Soldiers washing their vehicles at those motor pools contribute water to the small lake, and that water will be reused for the golf complex, Doyle said.

Transporting water from the lake involves a four-phase project. Phases one and two were completed this year with the construction of a pipeline and installation of pump capacity. The water is pumped through a two-mile pipeline to the golf course holding pond. The irrigation system pulls water from the pond.

The next phase will assess and determine whether the lake's dam can be raised 10 feet to allow the inflow of up to 40 million gallons of water. The last phase will integrate the nonpotable system into the installation's utility management control system.

The UMCS would automate the nonpotable system and avoid sending an individual out to the lake to turn on the pump manually, Doyle said. Sensors throughout the lake would detect the water level and avoid the lake being drained too deeply.

DFMWR also conducted an internal analysis to make its water operations more efficient.

"The staff was able to adjust the timing, the distance and the direction the water throws to conserve a little more water," Ernst said. "Then, we also installed a weather station."

The weather station calculates the evapotranspiration rate based on the water used by the plants, amount needed for replenishment, humidity rate, wind, temperature and other factors. The station then adjusts how much water is needed to irrigate the complex and automatically shuts down the irrigation system if rain is coming or if no watering is needed.

"This is a great partnership between DFMWR and DPW," said Nick Johnsen, director, DFMWR. "We are saving both natural resources and, at the same time, improving the bottom line of the golf course."

The green pump project is expected to show a return on investment within four years.

Fort Hood's nonpotable watering system could be used at other military golf courses.

"This is a best practice for Fort Hood and is an alternative for other installations with similar water challenges," Doyle said. "The green initiative reduces reliance on potable water and shows Fort Hood's commitment to protecting our natural resources."

POC is Randy Doyle, 254-287-1099, randy.doyle@us.army.mil.

Christine Luciano is the environmental outreach coordinator, DPW, Fort Hood.

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
DFMWR	Directorate of Family and Morale, Welfare and Recreation
DPW	Directorate of Public Works
UMCS	utility management control system

A small lake at Fort Hood collects nonpotable water from motor pools that is then transported to the golf course to be used for irrigation. Photo by Christine Luciano

Scranton Reserve center construction project mines solutions

by John Neville

The Army is a little stronger and the nation a little safer since the new Armed Forces Reserve Center opened in Scranton, Pa., in September. While the U.S. Army Corps of Engineers has built many Reserve centers across the nation, the one in Scranton is unusual. It sits on an abandoned coal mine, and such sites can pose problems.

The redevelopment or reuse of abandoned coal mines can be complicated by the presence, or potential presence, of hazardous substances, pollutants or contaminants. The federal government doesn't usually build on such sites because they present substantial liability down the road. However, when it can reclaim such sites, cleaning up and reinvesting in them protects the environment, reduces blight and takes development pressures off of green spaces and other untouched land. The practice is referred to as "beneficial reuse."

The Scranton Armed Forces Reserve Center was built on land known formerly as the Marvin Bank site. The property was used for coal mining operations from at least the 1930s. Reports indicate it was used for coal storage and reworking mine tailings, and it contained a refuse mining operation until the Army acquired it.

The proposal to build on the property presented the Corps with three problems — the possibility of contaminants, soil condition challenges and a compressed timeline.

The Corps set out to figure out whether the mining left behind hazardous materials and, if so, how much. The analysis involved drilling environmental boreholes at 20 locations and the collection of soil samples for analysis of volatile organic compounds, semivolatile compounds, polychlorinated biphenyls, and hazardous metals, iron and manganese.

"The contaminants of concern associated with the former mining activities included acid mine drainage, which is caused when sulfates and metals from mine tailings and exposed rock are oxidized and mixed with water forming sulfuric acid," said Louisville District environmental engineer Cristie Mitchell.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure

The Scranton Armed Forces Reserve Center, nestled in the hills of Pennsylvania, is built atop a former coal mine, a site that presented issues to be addressed. Photo by Michael Stewart

The levels of these materials would determine whether the project would move forward on this site. While some compounds were found in the borings, they were not found in high enough levels to prohibit building a nonresidential use structure.

The results also provided a record of what was in the ground prior to the Army taking ownership of the property. This record will shield the Army from liability if someone tries to sue the government for what was in the ground prior to the Army acquiring it.

"We were able to negotiate with the state and show our results and say, 'Look, this is all from the mining activity. Will you limit our liability if we take this property on?'," Mitchell explained. "That way, they won't come back in 20 years and say we [the federal government] contaminated a well downstream when clearly the contaminants are related to former mining operations."

Building atop mining areas also posed construction challenges. The disturbed or removed dirt that resulted from the mining left the ground less dense, not an ideal foundation for a large building. To offset the risk, the contractor used a process known as dynamic compaction.

The process involves dropping a heavy weight repeatedly on the ground at regularly spaced intervals. The impact of the free fall creates stress waves that help in the densification of the soil.

Besides moving past the challenges associated with building on a former mining operation, the Louisville District team that managed the project worked very quickly to support the acquisition schedule. The Army had to acquire the property by a certain date to meet the September Base Realignment and Closure deadline.

"We were developing the design at the same time we were acquiring property and conducting environmental due diligence," said district program manager Hans Probst.

"Because of BRAC, we got squeezed into a compressed timeline," Probst said. "We had to make some quick decisions with project design and property acquisition performed simultaneously over a relatively short period of time. The coordination was a challenge that the project delivery team overcame by working closely and communicating openly."

POC is John Neville, 502-315-7451, john.t.neville@usace.army.mil.

John Neville is the historian, Public Affairs, Louisville District, U.S. Army Corps of Engineers.

Langley-Eustis builds sustainable Warrior in Transition facility

by Joshua W. Miller

Wounded warriors assigned to the Warrior in Transition Unit at Joint Base Langley-Eustis, Va., will soon continue their recuperation in a newly constructed complex that pushes the envelope for sustainable design in the Army.

Warrior in Transition complexes are designed by the Army to provide therapeutic environments incorporating living units, spaces for social interaction and administrative operations into a campus that promotes nurturing, healing and learning. The complexes are designed with "new urbanism" ideals of sustainable communities, integrating housing and other land uses within walkable communities, allowing injured or temporarily disabled Soldiers to live, eat, train and work together. These complexes are intended to provide the best accommodations that the Army can build to express gratitude for wounded Soldiers' selfless service and sacrifice.

The Langley-Eustis Warrior in Transition Complex consists of three primary facilities — a 43,200-square-foot barracks that will house 64 Soldiers in a mix of fully accessible and adaptable units, a 16,600-square-foot company administration building that will provide office space for 76 people, and a 7,000-square-foot Soldier and Family assistance center.

In spring 2010, the Department of Army moved the company administration building and SFAC contract forward from a fiscal year 2011 to an FY 2010 award funded by the American Recovery and Reinvestment Act. At that time, the project development team seized the opportunity to incorporate forward-looking, energy-enhancement features and sustainable design measures into the construction program

A collaborative effort among the installation leadership, the U.S. Army Corps of Engineers' Norfolk District and the Center of Standardization at USACE's Fort Worth District, created a comprehensive listing of potential technologies. After exhaustive review, a final list of technologies and design strategies was established, and those items were incorporated into the design-build request for proposals as preferences and bid options.

The barracks facility contract, awarded in FY 2011, pushes sustainable design goals further. As currently awarded, Lifecycle Construction Services has committed to deliver both the company administration building and SFAC as Leadership in Energy and Environmental Design Gold certified facilities. Under the second awarded contract, Purcell-Lawman Joint Venture has committed to deliver the barracks as LEED Platinum, earning one of the first such designations for an Army-owned and USACE-constructed facility.

LEED Gold and Platinum, the highest certification levels that the U.S. Green Building Council awards, go to buildings designed to be environmentally responsible and economically sustainable, promoting a healthy living and working environment.

The Warrior in Transition complex site at Langley-Eustis incorporates old-growth trees and wetlands with site amenities such as sidewalks, walking trails and an outdoor pavilion. Each building design features an on-site rainwater harvesting system that will collect runoff rainwater in underground storage tanks.

Those tanks are connected to on-site reuse and irrigation systems. This arrangement allows for increased water quality credits by diverting runoff water from the storm system into localized holding tanks before being used for slower on-site direct infiltration as irrigation or reuse in building systems.

The rainwater harvesting system will help meet state and national regulations requiring new construction and designs to manage storm water at the source, allowing the size of detention and retention ponds to be minimized as well as limiting the impacts of erosion and peak runoff flows.

Acronyms and Abbreviations	
FY	fiscal year
LEED	Leadership in Energy and Environmental Design
SFAC	Soldier and Family assistance center
USACE	U.S. Army Corps of Engineers

Sustainability is not limited to the site. The buildings are also designed to maximize energy efficiency and reduce environmental impact.

Perhaps the most visually striking example of this balance of building and nature is the SFAC's green roof. The facility will incorporate an extensive-type vegetated roof assembly, featuring locally compatible, scientifically engineered, low-growth sedums. These hardy plants require little maintenance after their establishment period and provide an attractive appearance that ties the building directly to the surrounding environment.

This vegetated roof is a pioneering construction technique for Army standard design facilities, but its advantages promise to be numerous. The relatively lightweight extensive green roof can be installed over a variety of structures, including membrane roofs and metal roof decks, extending the life of the substrate by providing a protective cover from the direct weather and environmental elements.

The green roof is also expected to help minimize storm-water runoff and mitigate urban heat island effect. Water that is naturally stored in the growing media and the drainage retention layer is sufficient to sustain the drought-resistant sedums between natural rainfall events, and irrigation systems are not required for normal upkeep.

Another less visual but no less unique system will be incorporated into the barracks building — a gray-water recycling and reuse system — also a first for standard design facility types. The gray-water system will capture water from washing machines, sinks, showers and other non-black ➤

A rendering shows the Joint Base Langley-Eustis SFAC with its green roof. Photo by Jeffrey Windler

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water sources, recycling it through an on-site filtration system.

Gray water will be filtered on-site to a high purification level and stored briefly in a collection tank where colored dye will be added to indicate its recycled, nonpotable status. It will then be reused for demands such as toilet flush water, process needs and, potentially, irrigation.

This unique system helps to achieve multiple sustainable goals. Reusing gray water for on-site nonpotable water helps to reduce the overall water consumption and minimize the total water volume delivered to the off-site wastewater treatment facility. The system, in turn, will also use less energy and pollutant chemicals in the total water cycle process due to the reduced quantities of both fresh water and wastewater requiring pumping and treatment.

In addition, each of the facilities incorporates improvements to its building systems. The hot water boilers or water heaters of each building will be supplemented by a solar hot water system that will provide at least 30 percent of the hot water demand by directly renewable, sun-powered means.

Traditional heating and cooling systems were dismissed in favor of much more efficient ground-coupled geothermal heat exchanger systems for heating and cooling. This geothermal equipment will reduce fossil fuel energy consumption by creating a natural give-and-take process cycle with the ground of the site itself. Heating and cooling will be provided through a closed-loop system, drawing or rejecting heat directly from the earth by means of a thermal transfer fluid pumped through a series of buried pipes.

Finally, all lighting in the buildings will be ultra-efficient LED fixtures. LED fixtures draw significantly less energy than their traditional counterparts while also reducing the total heat gain from the fixtures and lighting equipment. These fixtures reduce demand and will be combined with occupancy sensors to further minimize power usage.

Collectively, these improvements will greatly contribute to energy efficiency gains for the facilities over similar-sized counterparts at other installations. The buildings achieve a 40 percent reduction over efficiency levels of American Society of Heating, Refrigerating and Air Conditioning Engineers 90.1-2007 in the company administration building and SFAC, and a 50 percent reduction in the barracks.

Other less dramatic improvements to the building systems and interiors include the use of efficient controls to create comfort zones within the building, allowing for variable heating and cooling based on utilization. Ultra-low-flow and waterless plumbing fixtures combined with zoned valves are expected to reduce water consumption by as much as 45 percent in each building.

In addition, the installation demonstrated its commitment to long-term sustainability goals by ensuring that the complex will meet all requirements for use of LEED-identified green housekeeping products. The installation will also use an energy management system and provide education programs about the facilities' green building initiatives to visitors and occupants.

The Warrior in Transition complex illustrates significant progress in sustainable goals. The facility will meet its commitment to Soldiers by providing a high quality recuperative environment and to the natural habitat by integrating energy-efficient, environmentally friendly designs.

These commitments were met conjunctively through an integrated development strategy by the installation, the USACE geographic district and the Center of Standardization while maintaining schedule and costs against the original programmed budgets.

As this project has shown, when the team is fully engaged in the goals of sustainable design and the needs of the user, cost does not have to be a limiting factor in providing an energy-efficient, sustainable and functional facility.

POC is Joshua W. Miller, 817-886-1891, joshua.w.miller@usace.army.mil.

Joshua W. Miller is a project coordinator, Center of Standardization, Fort Worth District, USACE.

At Fort Monroe: What's in the moat of a 177-year-old fort?

by Robert S. Reali

The Army closed Fort Monroe, Va., Sept. 15 due to the Base Realignment and Closure 2005 decision. Fort Monroe was a 565-acre Army garrison located on Old Point Comfort at the southeastern tip of the Virginia Lower Peninsula between Hampton Roads and the Lower Chesapeake Bay. The structure is the largest stone fort ever constructed in the United States and comes complete with a 20-acre moat.

Construction began on the present-day stone fort in 1819 and was completed in 1834. Fort Monroe became the keystone of the nation's coastal defense system following the War of 1812 and remained a Union fort in confederate Virginia throughout the Civil War.

Initial estimates of the munitions cleanup costs ranged from $100 million to $600 million. It was expected that an Army post with more than 180 years of military use would have plenty of improperly discarded munitions and duds lying around. A large portion of the cleanup comprised contents of the large moat surrounding the original stone fort.

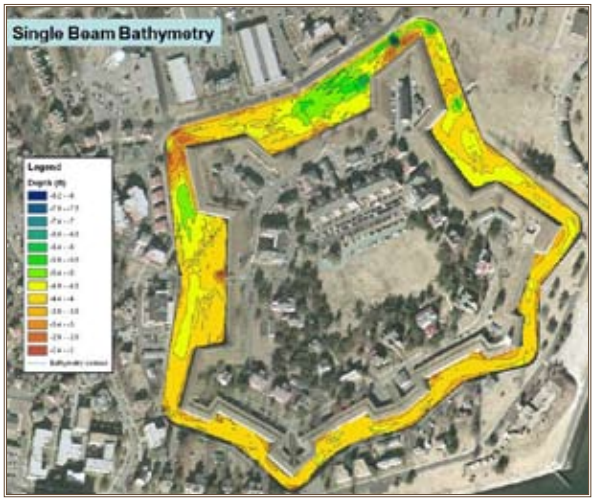
Contractors sweep the Fort Monroe moat for munitions. Photo courtesy of Science Application International Corporation

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure

In 1974, a proposal to dredge the moat required an investigation to determine whether historic artifacts and munitions in the moat would interfere with the project. A Navy dive team offered to help as part of a training exercise.

Fort Monroe and its mote sit on a peninsula between the Chesapeake Bay and the harbor at Hampton Roads, Va. Photo courtesy of Fort Monroe Public Works

In addition to the numerous historic artifacts recovered, the Navy team retrieved dozens of cannon balls, civil war artillery shells, fuzes and small arms rounds. While this effort recovered a large number of munitions and historic artifacts, it was not well documented. The dredging project never happened, and the completeness of the moat search has since remained in question.



A bathymetry image shows the depths of water in the moat. Photo courtesy of Science Application International Corporation

When Fort Monroe was placed on a proposed BRAC list in 1994, a baseline geophysical survey of the moat identified more than 70,000 metallic anomalies and labeled all of them "munitions." The project phase that would have verified whether those were actually munitions never occurred, however, because the base was not chosen for closure at that time.

In 2005, Fort Monroe was chosen for closure by the BRAC commission, and munitions were high on the list of environmental problems to be addressed. Following a 2006 historic records review, a contract was awarded for a remedial investigation and feasibility study in 2008.

Almost immediately, the scope and work plan for that investigation was considered inadequate by stakeholders. The proposed statistical screening method didn't cover enough acreage, and the nearby shore areas of swimming beaches were not covered at all. Most importantly, the moat, one of the most iconic areas of the fort, was to have only a review of the historical munitions information since its reuse potential was extremely limited.

After several unproductive meetings, the Army adopted a more collaborative approach to the planning process, ➤

Corps team's Fort Leonard Wood sustainable design earns award

by Eugene Pawlik

A 26-person multidisciplinary U.S. Army Corps of Engineers team was recognized by the Holcim Foundation for its sustainable design concept for Fort Leonard Wood, Mo., during a ceremony Oct. 20 at the National Building Museum in Washington, D.C.

The team received an *Acknowledgement Award* in the North American category of the *2011 International Holcim Awards for Sustainable Construction*.

The entry was titled "Energy, water and waste efficient military installation, Fort Leonard Wood, Mo." In addition to the concept plan that formed the basis for the award, the team developed an implementation plan that will be presented to Fort Leonard Wood officials to enable the post to achieve net-zero energy, water and waste by 2030.

Lyndsey Pruitt, an architect at Corps headquarters, is the main author of the project. Other team members and their districts are: **Sean Beville**, Fort Worth; **Daniel Brauch** and **Kenney Simmons**, Kansas City; **Leslie Campbell**, New Orleans; **Tracy Dorgan**, New England; **Angela Curtis**, Little Rock; **Greg Gilkison**, Huntington; **Eric Li**, **Keith Molina** and **Keane Nishimoto**, Honolulu; **Lindsey Nicole Matetich**, **Kelli Alison Polzin** and **Jennifer Ramirez**, Seattle; **Sara Murphy**, **Ryan Murphy** and **Parker Sherard**, Savannah; **Martin Regner** and **Paul Szempruch**, Galveston; **Laura Ruf**, St. Louis; **Elizabeth Smith**, Japan; **Cristin Szydlik** and **Matthew Valentine**, Sacramento; **Andy Temeyer** and **Cambrey Torres**, Omaha; and **Nathalie Westervelt**, New York.

POC is Eugene Pawlik, 202-761-7690, eugene.a.pawlik@usace.army.mil.

Eugene Pawlik is a public affairs specialist, Headquarters, U.S. Army Corps of Engineers.

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which led to the addition of land-based acreage in random search grids and search grids tied to future redevelopment areas. The moat would also get a much more detailed investigation, but it would be done as part of the surface water and sediment investigation under a separate contract.

The contractor first looked at the historical data collected about the moat to determine why it was assumed that the moat was such a huge munitions risk even though the future use for the moat was not going to change. Recalling the 1974 munitions effort, it was known that a majority of the munitions were found under a set of three embrasures — windows in the fort through which the cannons would fire.

A 1932 inspector general's report documented an inspection of that particular section of the fort. The inspector noted cannon balls, Civil War artillery shells, fuzes and small arms rounds improperly stored in this casemate and ordered the casemate cleaned out. The list of the items found in the casemate matches almost exactly the items recovered from the moat in 1974, suggesting that the Soldiers assigned the duty of clearing out the casemate simply threw the objects out the window into the moat.

Based on the historical information uncovered and lack of detail in previous munitions projects in the moat, it was determined that a full sweep of all 20 acres of the moat was required. A robust geophysical survey with magnetometers, side scan sonar, bathymetry and sub-bottom acoustic profiling was planned.

This survey identified 324 targets with a high confidence of being munitions based on their symmetry. When crews were actually sent in the water, no munitions were found. All of those targets were scrap metal, sign posts and tie-back rods used in the initial construction of the fort.

Because the main concerns of munitions in the moat were the possibilities of a future dredging project and of using the moat to provide storm-water capacity, the Army conducted a sedimentation analysis of the moat that went back to its original construction in 1834. The current bathymetry of the moat was graphed against a 15-foot 1904 scroll showing cross sections of the moat in 18 locations.

This graph provided a per-year average sedimentation rate of 0.2 inches back to 1904. This sedimentation rate is also consistent with the known depth of the moat in 1834 when it was constructed. The Army's conclusion was that sedimentation that could rob the moat of its storm-water capacity was not an issue, and dredging would not be required for many years.

Since no munitions sweep can ever be 100 percent confident of clearance and since munitions had been found in the past, institutional controls are required in the moat to provide an awareness of what could be found there and provide instructions should any future bridge or utility work turn up a Civil War shell. This awareness program will go along with institutional controls for the land-based munitions sweeps that were deemed appropriate when only two Civil War era shells were found during this phase of the project.

While a munitions investigation in a moat may not seem like something common in the environmental industry, the collaborative and methodical process used at Fort Monroe could be applicable at many Army cleanup sites that just don't fit the standard model.

POC is Robert S. Reali, 757-325-8955, robert.s.reali@us.army.mil.

Robert S. Reali, PE, CHMM, is the BRAC environmental coordinator, Fort Monroe Caretaker Team.

Fort Lee moves beyond 'pipe and pond'

by Dana Bradshaw and Richard Stanford

The past year saw the completion of a suite of low-impact development projects at Fort Lee, Va. The projects retrofitted existing storm-water infrastructure and serve as a model for future development.

With the culmination of Base Realignment and Closure, Fort Lee's daily population approaches 45,000, making use of more than nine million square feet of buildings and 75 miles of roadways. Bailey Creek, a small stream that originates at Fort Lee and forms a tributary to the James River, and ultimately the Chesapeake Bay, bisects the 3,846 acre cantonment area and forms the principal drainage for the installation.

In that context, Bailey Creek now appears on the state's 303(d) list of impaired water bodies for fish consumption and recreation. Most of its tributaries have increased flow rates, are heavily incised and carry significant amounts of sediment left from BRAC construction.

This situation happens not by chance but by design. The Army deals with conventional storm-water management at the construction site level only. Traditional designs call for piping the water to a pond, which releases it over time to a drainage system and ultimately to a creek or other watershed.

With a decades-old piping infrastructure and more than 60 storm-water ponds all releasing to Bailey Creek, Fort Lee had drainages that far exceeded the ability of the natural environment to accommodate them. One tributary received water from dozens of ponds and pipe systems, which caused it to be about 25 feet wide and more than 20 feet deep near its origin at the outfall.

In 2005, Fort Lee performed a comprehensive geomorphological study of Bailey Creek and identified upland drainage areas that contributed to the most degraded portions of the creek. The study also identified drainage areas with the greatest potential for storm-water controls that would reduce the adverse effects of development on the creek and assigned priorities to those areas.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
LID	low impact development

Recognizing that traditional storm-water management approaches often provide inadequate protection, Fort Lee adopted the latest tactic — low impact development. A description of that approach and descriptions of typical LID storm-water management units are found in Unified Facilities Criteria 3-210-10, *Design: Low Impact Development Manual*.

Two of the projects with the greatest impacts were mixing old infrastructure with new ideas at a training area and retrofitting the storm-water infrastructure of a large parking lot.

Training area project

Recent development at a petroleum and water training area of about 86 acres resulted in inadequate storm-water management that was causing regular flooding of several roadways and a well-used intersection. An 8.1-acre portion of the project area was retrofitted using ➤

The design of a bioretention swale at a Fort Lee training area encourages maximum infiltration and reduced storm-water movement for other than extreme rain events. Photo by Dana Bradshaw

An overview of the Fort Lee training area LID project depicts the layout of LID techniques that increased areas for infiltration as opposed to the previous ditched areas that simply transferred runoff to the creek system. Graphic by Richard Stanford

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LID techniques to solve these problems.

The LID approach consisted of:

- an infiltration trench at the northwest corner of a large concrete pad area;
- a 250-foot-long water quality swale constructed along the roadway leading into the area, which serves as a long, narrow bioretention area;
- a 1,400-square-foot bioretention area adjacent to the site;
- two smaller bioretention areas near the northeast and northwest corners of a nearby building; and
- a level spreader at the downstream terminus of the entire system.

These LID units were integrated into a traditional storm-water sewer line that conveyed water from the upstream infiltration trench, through an existing dry detention pond, beneath the large bioretention area, across the intersection, beneath the two smaller bioretention areas, across the main roadway and finally to a discharge point in a wooded area near the training area.

Where once flooding was apparent after a one-inch rain, this system accommodated a four-inch rain with no visible standing water.

The combination of LID and a traditional storm-water management system:

- achieves, to the extent practicable, Chesapeake Bay nutrient reduction goals;
- captures and treats about 7,187 cubic feet of runoff;
- captures and infiltrates roughly 4,362 cubic feet of runoff; and
- reduces the chance of flooding to less than 10 percent of potential storms.

Parking lot project

Some environmental conditions present special problems for LID practices, which often rely on infiltration of runoff. One of those conditions is moderate to steep slopes.

This project involved a 2.5 acre parking lot constructed on a 3.5- to 4-degree slope with all runoff directed to six drop inlets within the parking lot. The drop inlets were connected by a series of conventional storm sewer pipes that conveyed runoff directly to Bailey Creek with ever increasing velocity and erosive force.

This LID project took advantage of the existing traditional sewer system but implemented a 2,950 square-foot "off-line" bioretention area. The drop inlet catch basins were modified with a novel design that shunted initial runoff into a bioretention unit situated downslope and perpendicular to the fall of the parking lot but allowed the remainder of higher flows to enter the existing storm sewer system.

A heavily incised Bailey Creek tributary is more than 20 feet deep and 30 feet wide near the storm-water outfall. Photo by S. Nellis

In this way, consistent with the requirements of the *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects* in Section 438 of the Energy Independence and Security Act, the bioretention unit accepts the flows from 95 percent of the yearly storms, infiltrating up to 2,350 cubic feet of runoff and filtering the remainder of the runoff to remove pollutants from those storms. Runoff from the other 5 percent of storms is conveyed by the existing sewer system.

This system greatly reduces the flow volumes and erosive forces entering Bailey Creek. After completion of the project, a four-inch rain resulted in complete infiltration of all runoff with no water entering the existing storm-water infrastructure.

POC is Dana Bradshaw, 804-734-5080, dana.s.bradshaw.civ@mail.mil.

Dana Bradshaw is chief, Conservation Branch, Environmental Management Office, Directorate of Public Works, Fort Lee; and Richard Stanford is an LID design contractor, ATR Associates Inc.

Expanding Army water reuse: Study assesses practices, policies

by Richard J. Scholze and Marc D. Kodack

Where practical, the Army promotes and practices water reuse in several ways, such as for irrigation, aquifer recharge, cooling tower makeup, environmental purposes, vehicle washing and industrial uses. Despite ongoing efforts to conserve water at many installations, Army water consumption is not decreasing.

Some Army installations face future water shortages due to climate change, drought, declining surface streams or aquifers, and competing regional demands from agriculture, municipal consumption, energy production and environmental requirements. This reduction in available water resources may pose risks for the Army's ability to conduct its mission. In addition, the Army must meet goals such as those stated in Executive Order 13514, which requires a 2 percent annual reduction in potable water use and a total of 26 percent cumulative reduction by 2020.

To address these concerns, the Army Environmental Policy Institute asked the Engineer Research and Development Center's Construction Engineering Research Laboratory and its Center for Advancement of Sustainability Innovations to review and evaluate Army water reuse policies. The purpose was to identify changes and strategies to increase water recycling and reuse at Army installations and to summarize current Army practices.

One way to reduce consumption is through water reuse and wastewater recycling. Reused water quality varies. For example, Fort Sam Houston, Texas, is connected to the San Antonio Water System's reuse pipeline. The fort uses the highly treated reclaimed water for extensive irrigation and cooling tower makeup.

Acronyms and Abbreviations	
AEPI	Army Environmental Policy Institute
CERL	Construction Engineering Research Laboratory
CVWF	central vehicle wash facility
ERDC	Engineer Research and Development Center

Central vehicle wash facilities that operate at many installations are now designed to use recycled water. CVWFs are used to wash tracked vehicles like tanks and wheeled vehicles such as trucks.

A typical CVWF design consists of rugged "birdbaths" with concrete rumble strips on the bottom that shake sediment loose as the vehicle drives over the strips. Water cannons using high-pressure water jets are then used to remove the remaining soil and other material. All the used water is captured in a sedimentation basin with a grit chamber and oil skimmer, sand filter and holding pond. About one million gallons per day can be recycled at a large CVWF, a substantial portion of total water use for an installation. Fort Carson, Colo., estimates that its CVWF saves 150-200 million gallons per year in potable water. The design has been quite successful and has been constructed at more than 25 Army installations.

Fort Huachuca, Ariz., actively recharges highly treated effluent into infiltration basins that recharge to aquifers for enhancing local ecosystem services. Increased subsurface water will increase availability to domestic and industrial users, improve wetland maintenance and support habitats that depend on subsurface flow while also increasing water quantity and more uniform stream flows as it emerges to the surface.

The White House Climate Change Task Force directed federal agencies to apply ecosystem-based approaches and, where appropriate, adaptation that takes into account strategies to increase ecosystem resilience and protect critical ecosystem services on which humans depend to reduce the vulnerability of human and natural systems to climate change. Water reuse contributes in the areas of provisioning, regulating, cultural and supporting services.

Installations also are being encouraged to use rainwater harvesting for new projects. Changes in construction codes and

A Soldier cleans a truck at the Fort McCoy, Wis., CVWF, which has an 11-million gallon holding pond and recycles 98 percent of the water to clean equipment. U.S. Army photo

requests for proposals must be added to require contractors to incorporate rainwater harvesting into projects. The Energy Independence and Security Act of 2007 requires federal facilities to use low-impact development measures to retain more water on site. CERL is actively investigating beneficial uses for this captured water, such as irrigation, toilet flushing, cooling tower makeup water, water features like decorative fountains and vehicle washing. Plumbing codes are also being changed to actively promote the use of rainwater harvesting and gray-water reuse where appropriate and feasible.

AEPI posted the final report on its website, *http://www.aepi.army.mil.* The report is also available from ERDC-CERL. It assesses current and potential Army water reuse and wastewater recycling, including applicable laws and regulations, differences between regulations and guidelines, potable reuse considerations and installation water reuse examples. It offers recommendations for policy changes that will increase water reuse on Army installations.

POC is Richard J. Scholze, 217-398-5590, richard.j.scholze@usace.army.mil.

Richard J. Scholze is a senior project manager, ERDC-CERL, Champaign, Ill. Marc D. Kodak was a senior fellow, AEPI, Arlington, Va., during this project and is now a program and project manager, Office of the Assistant Secretary of the Army for Energy and Sustainability.

Wind tunnels at NASA Langley being removed by FRP

by Debra Valine

A Facilities Reduction Program project to remove wind tunnels and supporting facilities at NASA's Langley Research Center in Hampton, Va., is making history in more ways than one and is saving NASA a lot of money.

Langley officials approached the U.S. Army Engineering and Support Center, Huntsville's FRP about demolishing four wind tunnels and related structures. The FRP helps the Army and other government agencies eliminate excess structures to reduce fixed installation costs and achieve energy savings.

Specific facilities being demolished at Langley are the 30-foot-by-60-foot full-scale wind tunnel, two 8-foot tunnels that are large concrete structures located next to each other, and the 16-foot transonic wind tunnel complex, which includes 10 wind tunnel support facilities. The 16-foot complex also includes an administration building that will remain in place.

Partners in the project are: Huntsville Center; NASA Langley; the U.S. Army Corps of Engineers' Norfolk District; Charter Environmental, the prime contractor; and Neuber Environmental, the subcontractor. This project is unusual for the FRP, since it's a NASA facility rather than an Army facility, and the wind tunnels have historic significance.

Work got under way in January on the $3.75 million project. The project is expected to be complete in December.

"NASA's original estimate for the full scale wind tunnel and the 16-foot wind tunnel was $8.4 million," said Thad Stripling, Huntsville's FRP program manager. "We will remove those two tunnels as well as the other two with related structures for $3.75 million — that's less than half the original estimate."

Several large components of the full scale tunnel and smaller historic artifacts from the full scale and the 8-foot transonic pressure tunnel were salvaged for display at NASA Langley and other locations, including the Smithsonian. Some of the artifacts, such as 35 fan blades from the 16-foot transonic tunnel, are being incorporated into the structural design of new NASA Langley facilities. A full list of salvaged items is available at *http://crgis.ndc.nasa.gov/historic/Salvaged_Artifacts*.

"This project is very interesting because of its complexity," said project manager Mindy Shelton from the FRP. "These wind tunnels are historical structures that were used to test the capabilities of various aircrafts since before World War II."

Demolition of a historic structure requires years of planning and preparation, according to Mary Gainer, Langley's historic preservation officer. Memorandums of agreement with the Virginia Historic Preservation Office and the Advisory Council on Historic Preservation defined mitigation measures to be undertaken by NASA. These measures included preparation of Historic American Engineering Records, artifact salvage and curation, a public interpretation website and public display on the NASA Langley campus.

The wind tunnels were used for aeronautics research. In more recent years, they were employed in the shuttle program. Officials at Langley determined the wind tunnels were no longer needed and decided to remove them to reduce maintenance and associated costs.

"Many studies were done to determine the [potential] use of these facilities," said Cheryl Allen, Construction of Facilities program manager. "These tunnels used older technology and didn't answer today's aeronautics research questions."

FRP typically averages recycling 70 percent of the materials from a project. This project included steel and other valuable metals from the power systems and concrete, some of which will be kept on site to be used as backfill.

"This project will be interesting because our recycling numbers will be off the chart due to the steel and concrete," said Jeff Shea, Charter Environmental's site superintendent. "We'll probably exceed our recycling goals."

Acronyms and Abbreviations	
FRP	Facilities Reduction Program

Workers destroy a wind tunnel at NASA's historic Langley Research Center. Photo by Jeff Shea

"The full scale wind tunnel had a lot of transite asbestos that went to an appropriately permitted landfill and wood that went to a commercial waste landfill," said Skip Schroeder, a NASA project manager. "We looked for ways to recycle the wood, but because of the way the building was to be demolished, this was not feasible. The 16-foot wind tunnel is almost all steel and very valuable from a recycling perspective."

FRP removed structures at Langley last year, has worked for NASA at the Michoud Assembly Facility in Louisiana and has a current project at Goddard Space Flight Center in Maryland.

"Working with the Army Corps and the contractors has been a great experience," Allen said. "Last year, the FRP took down 20 of our buildings, mostly old office and storage space. That project went really smoothly. There has been a bit of creative problem solving with this project when unknown issues surfaced, but it is now going well.

POC is Debra Valine, 256-895-1691, debra.valine@usace.army.mil.

Debra Valine is chief, Public Affairs, U.S. Army Engineering and Support Center, Huntsville, Ala.

Renewable energy projects' ecological, environmental considerations

by Thomas Smith

Army installation energy managers are becoming more and more involved in energy supply and use considerations. Renewable energy projects that involve and impact Army lands are being proposed at an increasing pace on or near military bases. The unintended consequences need to be understood before these projects are approved. If not, many of the projects could have significant delays, work stoppages, costly overruns and ecological damage.

In part to achieve greater independence from traditional energy sources, increasing interest and technology development is being put toward renewable energy. The U.S. Army Corps of Engineers published Public Works Technical Bulletin 200-1-93, *Ecological Guidance for Renewable Energy Projects*, to help installation personnel involved in all aspects of renewable energy development and use become aware of important environmental and ecological considerations associated with those resources.

To comply with the Energy Policy Act of 2005; the Energy Independence and Security Act of 2007; and Executive Orders 13123, *Greening the Government Through Efficient Energy Management*, and 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, government agencies are required to greatly improve energy management, in part by expanding the use of renewable energy. The Army's *Energy Strategy and Campaign Plan* calls for achieving a net-zero energy status, which will necessarily require additional power and energy production capability. To meet these goals, the Army will have to increase energy management and conservation efforts as well as actively pursue renewable energy development on a large, utility scale.

Acronyms and Abbreviations	
PWTB	Public Works Technical Bulletin

This PWTB transmits information on factors affecting adoption of renewable energy projects to replace or supplement nonrenewable energy-use practices. It is intended to support decisions regarding energy use, availability and production at installations. Decision factors include current and potential mission use and requirements, fiscal and other costs for energy infrastructures, available technologies, and broad-based ecologic and environmental considerations, costs and risks.

The bulletin discusses renewable energy sources such as wind, solar, geothermal and biomass conversion, and identifies environmental and ecological attributes ranging from geology to biology to communications to air space to noise to socioeconomic factors that should be considered in pursuing renewable energy use and development.

Large renewable projects like wind turbines need to be evaluated for potential unintended impacts on the ecosystem. Photo by Dana Finney

The PWTB, accessible at *http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215*, provides information for facility and installation managers and other decision makers to use when considering renewable energy options. It also makes recommendations for baseline studies and the development of guidelines sensitive to mission, ecosystem, human health and other potential concerns.

POC is Thomas Smith, 217-373-5898, thomas.smith@usace.army.mil.

Thomas Smith is a senior project leader, Construction Engineering Research Lab, U.S. Army Engineer Research and Development Center.

Precautions to be taken when gopher tortoises are relocated

by Harold Balbach

Several Southeastern U.S. Army installations located within the natural range of the gopher tortoise, *Gopherus polyphemus*, are proposing to relocate or have already relocated tortoises to other places on or off the installation. The tortoise is protected to some degree all across its range and has been proposed as a candidate for listing as a threatened species under the Endangered Species Act.

There are many reasons for relocation, one of the most critical being to remove them from construction sites. In other situations, the idea may be to build up viable populations in locations not subject to intensive training.

Public Works Technical Bulletin 200-1-91, *Management Guidance for Gopher Tortoise Relocation*, available at *http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_91.pdf*, answers some of the many questions that arise when ➤

A gopher tortoise is measured prior to relocation to collect data on population, age and sex. Photo by Harold Balbach

Bulletin describes native species to revegetate Army lands

by Thomas Smith

Army land managers are often involved with land restoration, reclamation, rehabilitation and remediation. In most if not all instances, these actions involve some sort of revegetation. The U.S. Army Corps of Engineers released Public Works Technical Bulletin 200-1-90, *Guidance on Native Plant Species Suitable for Ecological Restoration*, to help land managers identify and select plant species best suited to their local area.

To effectively manage Army lands for sustainability in the face of a variety of missions and purposes requires a knowledge and understanding not only of the ecology of those lands but also of the key components, particularly the native vegetation. To fulfill obligations and requirements of numerous authorities — in particular, Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*; Army Regulation 200-1, *Environmental Protection and Enhancement*; and Executive Order 13112, *Invasive Species* — land managers need to have knowledge of and access to resources that will allow them to make informed, science-based decisions for all types of revegetation whether it be on training ranges, natural resources sites, cantonment landscapes, environmental cleanup sites or other installation areas.

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
ERDC	Engineer Research and Development Center
PWTB	Public Works Technical Bulletin

In addition to promoting overall ecosystem sustainability, the use and management of native plant species can have positive effects and impacts on:

- the control of alien species, which are not native to the ecosystem, and invasive species, because they are likely to cause economic or environmental harm;
- water resources and wetlands;
- watershed management;
- nonpoint source runoff;
- soil erosion control;
- threatened and endangered species;
- native fauna;
- maintenance and restoration of vegetation communities;
- wildland and prescribed fire management;
- pollution control and contaminant remediation; and
- training land and range maintenance.

This PWTB, accessible at *http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215*, provides a list of native plant species suitable for use in revegetation of military lands. Appropriate native plant species can be selected by ecoregion for the lower 48 states.

A PWTB provides guidance for selecting native species to use in revegetation, like for this traditional drill seeding after a wildfire. Photo courtesy of ERDC-CERL

The bulletin is organized in an easy-to-use tabular format that shows each species' growth form, season of growth, soil types, establishment characteristics, drought tolerance, longevity, cold hardiness and salinity tolerance. It also shows natural distribution of species and how suitable they are for erosion control. In addition, the PWTB contains references used in identifying the species listed and a listing of other relevant resources.

POC is Thomas Smith, 217-373-5898, thomas.smith@usace.army.mil.

Thomas Smith is a researcher, Construction Engineering Research Lab, U.S. Army Engineer Research and Development Center.

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relocation is undertaken.

The different concerns vary widely in importance when preparations are being made for relocation of tortoises on Army property. While the relative importance of each topic may vary from installation to installation and state to state, each of the areas should be a part of the evaluation of every relocation plan. The relative importance will vary with each action and each setting. A summary of recommendations drawn from experience and other publications is presented for each factor, and references with links, as appropriate, are included for the sources of this information.

One important recommendation is that records of physical condition be kept for each animal moved so that survival after release may be determined more accurately. Two relatively nontechnical data sheets on which this information may be recorded are included.

Examination of the areas of concern presented, combined with consideration of the factors locally known to be important, will help land managers and wildlife specialists ensure that their relocation plans are successful in the long term and that the Army is able to meet the standards expected for managing a sensitive species.

POC is Harold Balbach, 217-373-6785, hal.e.balbach@usace.army.mil.

Harold Balbach is a senior project manager, Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.

Career development: Breaking your own glass ceiling, part 4

by Jim Hearn

In the three previous editions of the Public Works Digest, I discussed conducting a personality assessment, personal SWOT (strengths, weaknesses, opportunities, threats) analysis and developing a general plan for your career path. I will now cover one of the important tools that you need to pursue your career goals. To get your foot on any rung of the career ladder, you need a compelling resume.

For this article, I will focus on federal service resumes and not private sector resumes, which tend to be much shorter.

Pure and simple, your resume is a marketing document. What you are marketing is yourself. It is not just a chronological listing of previous positions but rather a description of what you have accomplished. Think of a print advertisement that was appealing, factual and made you want to explore further. That is the effect you want your resume to have on the reader.

In many cases, the selecting official may have 50 resumes to review in a short period of time. If your resume is boring, disjointed, too general or poorly written, it will be given little consideration. If you are serious about the position that you are pursuing, then this is the most important document that you have ever written.

Don't write a generic resume and assume it will work for any position on the USAJOBS website. The hiring official is looking for specific knowledge, skills and abilities that are appropriate to a particular position. It is unlikely you will hit many of the specific skills with a generic resume.

Following are some points to help your resume stand out.

Address the requirements in the job announcement – They are the specific skills, knowledge and abilities that the selecting official is requiring. Usually, they appear in the order of importance to the selecting official. In many cases in which an applicant complains about nonselection, I compare his resume to the job announcement and see a complete disconnect.

Jim Hearn
Photo by Harry Weddington, Omaha District

Don't copy your job description – Most selecting officials already know what your job description says. Take the elements in your job description and show what you accomplished against those elements. Highlight any awards, honors, creditable accomplishments or other ways of showing your great work.

Be bold but don't lie – If you did something well, say that. If you were asked to serve outside your job description, highlight your accomplishments. Don't include something that you did not do. You don't know who will read your resume and recognize the issue.

Arrange highest to lowest – Your first sentence should be the most important thing that you want to tell the reader. It should grip the reader so that he or she wants to read more. Don't put some unimportant fact first just because it was the first thing that came to your mind. Don't make the reader work to figure out how good you might be as an employee. When I read through the first three or so sentences on a resume and I can't find a pulse of significant accomplishment, I file it in the dead resume file.

Show job growth whether its 10 years of experience or one year 10 times – If you have been in the same position for a long period of time, try to show how you have grown in competence during that period. Hiring officials like to see job growth and advancement in a candidate. It is an indicator that others saw talent in you. If there were reasons for not advancing, such as a dual-earning family or taking care of aging parents, then say that.

Use facts, figures and examples – Make your resume come alive. Allow the reader to visualize how good you are. If your program grew by 15 percent more than any previous year, stating that fact looks better than just saying that your program increased. Examples bring life to dull-sounding tasks.

Write in short, hard-hitting sentences – Your writing should reflect Earnest Hemingway, not James Joyce. Your sentences should hit the reader like a boxer — pop, pop, pop. You don't want sentences so long that the reader falls asleep — I've seen them.

Use action words – Write in the active, not the passive, voice. Use verbs that convey what you did, i.e., managed, supervised, accomplished, risked, orchestrated, prepared, exceeded.

Check grammar and spelling – You should spell check, proofread, and do it again and again. Have others proofread. This is a deal-breaker! As a selecting official, if I saw blatant mistakes in spelling or grammar on your resume, I would assume that you showed no attention to detail or pride in what you prepared. If you cannot get this most important resume correct, how can I trust you with my routine paperwork?

Spell out acronyms – You don't know who will be screening your resume. It might be someone who knows nothing about your profession. Make sure that your message is clear to anyone and not just someone like you.

Explain special professions like Reservists or former military – Much of what you did on active or Reserve duty ➤

Rose by another name: Academy changes title

by Gustavo (Gus) De Jesus

The Directorate of Public Works Academy has taken another name. The new name is Installation Management Command Academy, School of Public Works.

The DPW curriculum was established under the auspices of the IMCOM Academy, which brings all IMCOM institutional training under a single enterprise solution. In the near future, the School of Public Works will include all functions and skill sets found in a traditional DPW, including housing, environmental work, energy, sustainability and other functions.

School of Public Works courses are held at the IMCOM Academy facility at Fort Sam Houston in San Antonio. There is no tuition for the courses. The student's command must pay travel and temporary duty costs.

Gustavo (Gus) De Jesus
Photo by Michael Andres

Acronyms and Abbreviations	
DPW	Directorate of Public Works
IMCOM	Installation Management Command

Courses, schedules and enrollment procedures can be found at *https://www.us.army.mil/suite/page/649494*. Hotel registration is posted there for some courses. Additional courses will be posted in the near future.

POC is Gustavo (Gus) De Jesus, 210-466-0618, gustavo.dejesus@us.army.mil.

Gustavo (Gus) De Jesus is the dean, School of Public Works, IMCOM Academy, and the chief, Facilities Management Branch, Headquarters, IMCOM.

Making plans come true: planning visualization

by Jerry Zekert

A key competency that planners and designers must gain is skill in visualizing what the future is going to be. Sometimes, a simple picture is worth a thousand words.

The Master Planning Institute's Course 958, Master Planning Visualization, is the perfect fundamental class for planners, programmers, designers and others who need to gain this skill. Class participants learn how to use Google SketchUp and Adobe Photoshop to make great planning renderings and site proposals that come alive.

The skill is a tremendous asset in working with stakeholders to help them see what they are proposing.

Jerry Zekert
Photo courtesy the Master Planning Team

The class is accredited for continuing education units by the American Institute of Certified Planners, the American Institute of Architects and others.

Master Planning Visualization will be offered Jan. 31 through Feb. 2 at the U.S. Army Corps of Engineers Learning Center in Huntsville, Ala.

For more information or to register, contact the registrar at 256-895-7401, or look at the Department of Defense Master Planning Institute website, *http://www.dodmpi.org*.

POC is Jerry Zekert, 202-761-7525, jerry.c.zekert@usace.army.mil.

Jerry Zekert is the chief, Master Planning Team, Headquarters, U.S. Army Corps of Engineers.

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was specialized. Find a way to present those accomplishments in terms that the civilian sector can understand. See if you can relate your work with similar work on the civilian side. If the job does not fit exactly, possibly the skills required to do the job do compare favorably to something a hiring official would want.

I've seen my share of poorly written resumes. Some have job descriptions, some wander all over the place, and others are just boring. Spend the time to find the right words to make the reader want to read more about you and maybe call you for that all-important interview.

Jim Hearn, Ph.D., is the director, Regional Business, Northwestern Division, U.S. Army Corps of Engineers, and a Career Program 18 Planning Board member.

U.S. Army Installation Management Command
2405 Gun Shed Road
Fort Sam Houston, TX 78234-1223
www.imcom.army.mil