

Public Works

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Juan Arango, a steelworker with L.R. Wilson Co., cuts away a template from around anchor bolts at a Base Realignment and Closure project in Alexandria, Va. Photo by Marc Barnes, Belvoir Integration Office, U.S. Army Corps of Engineers. Page 21



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Public Works DIGEST

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IMCOM Public Works and fiscal reality

by Greg Kuhr

It is incumbent upon all that we recognize the new fiscal reality of our nation and adopt a culture of living with reduced resources. We should anticipate increasingly reduced Army budgets for both Military Construction and Operations and Maintenance and ensure our funding and decision making is prioritized to meet Army mission requirements.

For Installation Management Command, this new reality mandates that we re-evaluate our facility requirements to include facility quantity, size and location given recent Base Realignment and Closure and other stationing actions. With this new resource-constrained perspective, I am confident that we can continue to provide the facilities to provide Army Soldiers and Families the quality of life on Army installations that they deserve.

I would like to highlight a few initiatives that will affect the IMCOM Public Works community. Each of these initiatives will inform headquarters decision making and posture the Army to focus resources within this new fiscal reality.

Facilities Investment Strategy

The Office of the Secretary of Defense funds the Army at 90 percent of the Facility Sustainment Model requirements. Insufficient Restoration and Modernization funds are programmed for fixing deteriorated facilities, which causes installations to use their sustainment funds to fix critical problems. This sustainment migration contributes to further facilities deterioration and, in turn, increases our R&M requirements or MILCON solutions.

Construction for Army initiatives such as BRAC, Global Defense Posture Realignment, Grow the Army and Army Modular Force have resulted in significant growth (fiscals 2005-15) of our OMA-supported facility footprint. Despite significant construction for these Army initiatives, significant facility shortfalls



Greg Kuhr
U.S. Army photo

and overcrowding still exist. As such, the Office of the Assistant Chief of Staff for Installation Management, in coordination with IMCOM, is developing an Army-level strategy to manage our facility footprint, to improve facility quality and complete buy-out of facility shortfalls in a resource-constrained environment.

The goal of this FIS is to provide sufficient facilities to meet our requirements at the least cost with acceptable quality and quantity. The objectives of the FIS are:

- **Sustain required facilities** – Continue funding sustainment at 90 percent.
- **Demolish or divest excess facilities** – Analyze facility utilization for potential consolidations that will free up additional facilities for disposal. Accelerate demolition over a 10-year period. Disposal will prevent unauthorized tenant expansion, reduce sustainment and base operations costs free up real estate for repurposing and prevent the potential safety issues of unoccupied facilities.
- **Improve existing facility quality** – Improve Q3- and Q4-rated facilities that present obstacles to mission accomplishment, buy out training barracks and buy out utility and energy initiatives.
- **Build out facilities shortfalls** – Focus MILCON effort on critical shortages and opportunities for O&M R&M repurposing or modernizing existing facilities and relook facility standards.

| Acronyms and Abbreviations | |
|----------------------------|--|
| FIS | Facility Investment Strategy |
| FSM | Facilities Sustainment Model |
| FY | fiscal year |
| GFEBS | General Fund Enterprise Business System |
| IMCOM | Installation Management Command |
| LEED | Leadership in Energy and Environmental Design |
| MILCON | Military Construction |
| O&M | Operations and Maintenance |
| OACSIM | Office of the Assistant Chief of Staff for Installation Management |
| R&M | Restoration and Modernization |
| RPLANS | Real Property Planning and Analysis System |
| SDD | Sustainable Design and Development (program) |

Sustainment, restoration and modernization

The FSM generates annual sustainment funding to keep real property facilities serviceable throughout their expected service life. The model considers regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs.

FSM also includes major repairs or replacement of facility components, usually accomplished by contract, which are expected to occur periodically throughout the facility life cycle. Major work includes regular roof replacement; refinishing wall surfaces; repairing and replacing electrical, heating and cooling systems; and replacing tile and carpeting. IMCOM provides the garrisons with 75 percent of their requirements according to the model under the IMCOM Funding Guidance.

To manage essential R&M projects, IMCOM withholds 15 percent of the sustainment funding generated by FSM. In FY 2011, IMCOM plans to execute \$656 million to support the Army's R&M immediate requirements. This number includes \$214 million for the Training Barracks Upgrade Program; \$187 million for Permanent Party Barracks Moisture Water Vapor projects; \$41 million for Q3 and Q4 R&M projects; \$133 million ➤



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for energy and utility projects; \$30 million for demolition; and unexpected storm damages, which this year alone have exceeded \$61 million.

Real property

Much is happening in the real property world in three major areas: Chief Financial Officer's Act audit preparation, Real Property Planning and Analysis System data improvements and conversion to the General Fund Enterprise Business System.

Audit preparation is well underway at all garrisons with a target date of the end of September. The purpose of the audit is to demonstrate that our real property records match the physical assets beginning with the 1354 and each recapitalization work order. This effort requires a tremendous amount of work considering that some installations have as many as 9,000 facilities.

RPLANS, as a system that compares assets against requirements, is being improved at the programmatic level and at the installation level. Three of four staff assistance visits are complete, and the final one is scheduled at the end of July.

Real Property specialists are busy transitioning from the Integrated Facilities System to GFEBS. Much hands-on learning is required to accurately convert real property records and create new property records.

Facilities Reduction Program

The Army has the largest real property inventory within the Department of Defense, which is the largest within the U.S. government. As the Army transforms to meet future missions, our installations will remove outdated, excess and temporary buildings.

The Facilities Reduction Program is to ensure removal of excess facilities on Army installations primarily with OMA funds. The remaining removal activities are under the direction of the Military Construction,

Army. In FY 2011, IMCOM succeeded in funding \$30 million to demolish more than two million square feet consisting of 450 Army facilities.

The management of construction and demolition debris from the removal of millions of square feet of excess Army buildings is a major challenge. Installations are incorporating Sustainable Design and Development principles into facility planning decisions to improve energy usage, quality of life and the environment.

The increasing costs of waste disposal and the growing acceptability and greater value of used building materials make the recovery, reuse and recycling of construction and demolition debris an important and cost-effective component of SDD. Sustainable approaches to waste management can simultaneously provide benefits to the community and the environment, while cost effectively supporting construction, renovation and demolition activities.

Enterprise Energy Strategy

The *Installation Management Campaign Plan* is being implemented with a specific Line of Effort focused on energy and water efficiency and security.

IMCOM has issued an energy operations order, 10-257, that requires a broad range of actions at installations, including:

- establishment of an installation comprehensive energy and water conservation program,
- accomplishment of campaign plan goals, and
- enhancement of our energy posture across IMCOM.

By achieving our energy conservation, efficiency and security goals, we will better position the Army to accomplish its mission, regardless of the energy challenges in the future, in a more cost-efficient manner.

The energy operations order directed

specific actions and energy conservation measures to help achieve mandated energy goals, with an emphasis on low-cost/no-cost measures, and identification and development of all energy- and water-efficiency projects with less than a 10-year payback. IMCOM's strategy is to initially target low-cost and no-cost projects for funding, with a goal to buy out these projects at as many garrisons as possible, then focus on projects with less than a 10-year payback.

In FY 2011, IMCOM funded \$112.3 million for garrison energy and utility infrastructure projects. This funding included \$16 million for low-cost or no-cost energy projects, \$41.4 million for Installation Status Report red or black condition utility systems projects and \$54.9 million for energy- and water-efficiency projects with less than a 10-year payback.

SDD

The Energy Independence and Security Act of 2007 included a requirement to "identify a green building certification system and level" to demonstrate efficient and sustainable use of water, energy and other natural resources; use of renewable energy sources; and improved indoor environmental quality through enhanced indoor air quality, thermal comfort, acoustics, day-lighting, pollutant source control, use of low-emission materials and building system controls.

In late 2008, OACSIM established the SDD Program to ensure all new construction meets the statutory requirement for green building certification. In addition, beginning in FY 2013, all new construction and major renovation projects shall be planned, programmed, budgeted, designed and built to achieve reduced energy consumption at or below levels specified in the American Society of Heating Refrigeration and Air-conditioning Engineers Standard 189.1-2009, *Standard for the Design of High-Performance Green Buildings*. ➤



USACE solutioneers Building Strong for a sustainable future

by Robert E. Slockbower

Continuing to meet military mission requirements in this budget-constrained environment is a challenge the U.S. Army Corps of Engineers is addressing head-on. Now more than ever, our engineers are faced with managing complexity while driving innovation to meet the current and future infrastructure needs of our military and our nation. They are really more like “solutioneers” as they blend creative imagination with technical know-how in their approach to improving our infrastructure and supporting world-class sustainable installations that Soldiers call home.

To address this daunting challenge, USACE partners on military infrastructure issues with the Installation Management Command, the Office of the Assistant Chief of Staff for Installation Management, the Office of the Assistant Secretary of the Army for Installations, Energy and Environment and the Department of Defense, bringing technical expertise to bear on these extremely challenging issues.



Robert E. Slockbower
Photo by F.T. Eyre

Three key areas of focus as we forge ahead are sustainability, energy and defense infrastructure.

Sustainability

What we build today must be adaptable if it is to endure well into the future. USACE’s cutting edge Climate Change Adaptation Policy was recently approved by the assistant secretary of the Army for civil works. The policy states that, because

| Acronyms and Abbreviations | |
|----------------------------|---|
| DCIP | Defense Critical Infrastructure Program |
| DoD | Department of Defense |
| EEAP | Energy Engineering Analysis Program |
| IMCOM | Installation Management Command |
| UP | Utilities Privatization |
| USACE | U.S. Army Corps of Engineers |

of the climate change and variability that we’re observing today and anticipating in the future, all of USACE — divisions, districts, centers, labs and executive offices — will integrate climate change adaptation planning and actions into their missions, operations, programs and projects. This policy will have major impacts on our decisions regarding existing and proposed infrastructure on military installations.

USACE is keenly interested in the American Society of Civil Engineers’ initiative to embed sustainability principles into horizontal infrastructure programs and projects through sustainable infrastructure project certification. We require the use of Building Information Modeling technology, which promises to raise

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The Army selected the U.S. Green Building Council’s Leadership in Energy and Environmental Design rating tool and set LEED Silver as mandatory criteria for MILCON projects.

Tools to manage our business

The Army has selected GFEBS as the automated tool to replace its aging financial and real property systems. GFEBS’s strength is in the cost culture it promotes by providing total transparency and accountability of our resources.

While cost accounting is not foreign to the Public Works community, GFEBS provides the capability of capturing the total costs to maintain and operate the Army’s real property facilities and infrastructure by integrating the financial execution with the real property data in

one system. The transition does have its challenges, but we continue working on improvements to the system and are confident that, in addition to providing accurate and detailed cost accounting, it will also become a valuable tool to all Directorates of Public Works in their day-to-day planning and decision making.

Looking ahead

The MILCON-Energy Integrated Planning Team will identify costs and impacts to bring all future MILCON into compliance with the energy statutes and to assess the impacts on life-cycle and facility O&M costs. This team will report findings to the Stationing Senior Review Group for planning MILCON Future Years Defense Programs.

In the meantime, to leverage the current favorable bid-savings climate, FY 2012 MILCON projects and projects at less

than 35 percent design will be adjusted for increased energy efficiency and include mandatory LEED requirements from among the criteria in the rating system. This change in requirements will help ensure IMCOM achieves success in meeting *Installation Management Campaign Plan*, Line-of-Effort 6, Energy Efficiency and Security.

Directorates of Public Works must remain current to fast-evolving sustainability, energy-efficiency and water-conservation requirements, and ensure incorporation of these into all projects. Success lies in the hands of all who are responsible for our infrastructure. Be proactive by transforming our installations into modern and sustainable facilities to stay Army Strong.

Greg Kuhr is G-4, director of Facilities and Logistics, IMCOM.



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understanding of the site's facilities and infrastructure life cycles, facilitate design and construction, and prepare for operational and maintenance needs.

USACE has also embarked on research to improve future infrastructure sustainability, including:

- capabilities to model building envelopes to optimize energy design and material decisions;
- an integrated planning environment for energy, water and waste planning at the campus (cantonment) scale to support the Army's net-zero goals; and
- tests and evaluations of microgrids to improve the intelligence in links between energy supply and energy demands at

military bases.

Energy

Energy infrastructure must remain affordable in terms of both infrastructure improvements and future operating costs. As Army and DoD budgets are scrutinized and reductions are becoming imminent, more efficient infrastructure systems will be required to reduce our utilities payments.

Sustainment, Restoration and Modernization funds are used to renew our infrastructure systems, but, in many cases, it is a challenge to determine which systems need immediate care and which are at an acceptable level of efficiency. Therefore, IMCOM and USACE have partnered to expand the Energy Engineering Analysis Program, which conducts holistic energy assessments and

develops capital investment strategies to bring Army installations into compliance with annual energy-use reduction goals. The Comprehensive Energy and Water Management Plan complements the EEAP by producing a plan of action to reach Army and DoD goals.

Third-party financing tools provide alternatives when funds to upgrade infrastructure are short. For instance, Energy Savings Performance Contracting can be used to upgrade existing or replace failing systems. Complementing this program is the Utilities Energy Saving Contract, which uses local utility companies' financing to improve and modernize installation infrastructure systems. Finally, Utilities Privatization is an investment strategy that leverages private financing to recapitalize utilities infrastructure wherever economical.

UP transfers ownership and upgrades the infrastructure to industry standards. Congress authorized UP service contracts in 1997. From 1999 through fiscal 2010, 147 Army utility systems were privatized, 157 systems were determined not economical to award, and 51 systems remained to be evaluated. UP contracts have projected life-cycle cost avoidance of \$1.9 billion, or 28 percent, as compared to similar upgrades and repairs under continued Army ownership.

Defense infrastructure

DoD's Defense Critical Infrastructure Program enhances risk management decision-making capability concerning critical infrastructure. DCIP exists to help identify those infrastructure assets that are very important and need protection to carry out DoD's critical missions.

Within the DCIP, there are 10 defense infrastructure sectors, each with an agency or a combatant command assigned as the lead agent. USACE is the lead agent for the Public Works defense infrastructure sector. As the Public Works Sector lead, USACE ensures that utilities such as

Army facility is prototype for net-zero at Department of Energy

by Paula J. Loomis, Andrea Wohlfeld Kuhn and Leandra Thompson

When the Department of Energy's National Renewable Energy Laboratory in Golden, Colo., reached net-zero status in June 2010, few realized that four years earlier, in 2006, the U.S. Army Corps of Engineers used performance-based design-build to procure, design and construct the 4th Infantry 1st Brigade and Battalion Headquarters at Fort Carson, Colo. The Fort Carson building then served as the prototype for NREL's Research Support Facility.

Net-zero energy consumption is a critical goal for federal agencies. The Department of the Army takes the concept further, seeking to attain net-

Acronyms and Abbreviations

| | |
|-------|--------------------------------------|
| NREL | National Renewable Energy Laboratory |
| USACE | U.S. Army Corps of Engineers |

zero water and waste as well.

With the emphasis on energy and sustainability and the adoption of federal, state and local mandates, it is imperative that design and construction agents and firms benchmark from successful projects to provide highly efficient, sustainable facilities. The Fort Carson and NREL teams used benchmarking in their design and acquisition methodologies. Smart acquisition decisions promote environmental conservation, sustainable workplaces and lower energy costs — winning combinations.

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2011's massive storms present challenges

by Mindy Rosito

During the past seven months, storms and weather situations — from tornados, to ice, to flooding — have attacked several Army installations. Fort Leonard Wood, Mo., sustained millions of dollars of damage as a result of an F4 tornado while celebrating the New Year. Through the winter months, Fort Hood, Texas, Fort Sill, Okla., and Fort Bliss, Texas, sustained damages as a result of freezing temperatures uncharacteristic for these geographic locations. Most recently, Fort Benning, Ga., Fort Bragg, N.C., Fort Campbell, Ky., and Redstone Arsenal, Ala., experienced tornados.



Mindy Rosito
Photo by Tomas Rodriguez

Business rules summary

A natural disaster is defined as an exceptional weather event that causes damage to multiple facilities. Typical examples are hurricanes, typhoons, tornados, high winds, hail, floods, ice and extended severe cold causing multiple pipe freeze-ups. Seasonal occurrences consistent with the geographical region — e.g., snow storms in upstate New York or extreme heat in southern states — are not eligible.

Generally, the following types of damages are not considered qualified natural disaster or fire damage: mold, equipment failure due to power surges or lightning strikes, leaks, roof damage or localized flooding occurring solely as a result of heavy rainfall and water damage caused solely by the backing up

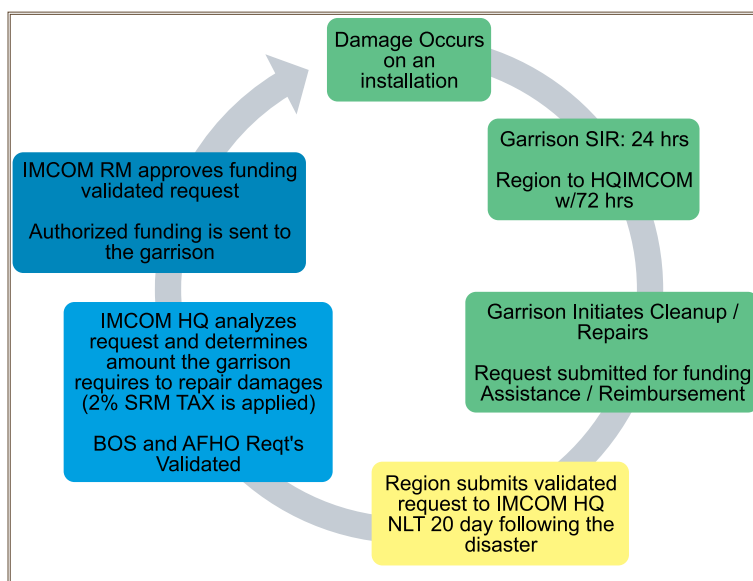
of wastewater systems.

The current Headquarters, Installation Management Command, business rules require all garrisons to reserve 2 percent of their initial Sustainment, Restoration and Modernization funding for immediate repairs resulting from

natural disasters or fire damages. In situations where the 2 percent is exceeded, Headquarters IMCOM will look for funding only after careful validation of the damage is complete.

The reports from natural disaster and fire damage are due at Headquarters IMCOM within 30 days of the disaster. Meeting this deadline has been a huge challenge for many installations.

In cases where the paperwork cannot be submitted on time, it is important to communicate with headquarters. The required paperwork consists of



This diagram illustrates the cycle of natural disaster reporting and funding. Graphic by Tom Undes and Mindy Rosito

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electricity; water; heating, ventilation and air conditioning; and other services that support DoD's critical infrastructure are reliable and resilient under all threat and hazard environments.

DCIP identifies critical assets, assesses the threat and vulnerabilities, and performs risk assessments. Then, a risk-informed decision is made as to how to remedy the concerns. During fiscal 2011, the DCIP community developed Risk Decision Packages on prioritized infrastructure.

USACE provided technical assistance in the development and review of these packages, which are risk-informed decision documents that identify prioritized courses of action to mitigate identified risks. When risk mitigation projects are funded, most will become Military Construction projects, and USACE will have another opportunity to provide service to DoD.

Clearly our engineers, or rather our solutioneers, have their work cut out for them as we continue striving to protect, sustain and improve the natural and

manmade environment through innovative solutions geared toward a sustainable future. Thanks to our partnerships with IMCOM, the OACSIM and DoD, we are not facing these challenges alone. As we continue to focus our combined efforts in the areas of sustainability, energy and defense infrastructure, we will be laying solid groundwork for a sustainable future that will serve our country and our Soldiers for years to come.

Robert E. Slockbower is the director, Military Programs, USACE.



Over the top: Army Reserve roofing life-cycle management

by Bud Lewis

Reviewing its five-year Corporate Installation Sustainment Plan in 1999, the Army Reserve Installation Management Directorate identified a trend that was troublesome. In most years, roofing projects comprised 50 percent or more of repair and maintenance capital expenditures.

ARIMD leadership determined that a comprehensive approach was needed to drive down the life-cycle cost of its roofing inventory. In 1999, the Army Reserve began the pilot development of a roofing program now referred to as the Army Reserve National Roofing Initiative

This initiative has been refined each year for more than a decade and has now become one of the most recognized programs of its type in the industry. An Army Installation Management Command-wide strategic sourcing study in 2009 identified significant savings opportunities in roofing services, and IMCOM decided to leverage the Army Reserve's NRI. An article published by *Supply & Demand Chain for Executives* in 2010 highlighted the Army Reserve's success in managing the total life-cycle cost of its roofing inventory, and the NRI program has been publicly endorsed by both the National Roofing Contractors Association and the Roof Consultants Institute as one of the most comprehensive and cost-effective roofing programs in the country.

Initiative

The NRI's goals are:

- to eliminate leaking roofs, and thus protect the personnel and equipment in Army Reserve facilities;
- to sustain roofs in a green condition; and
- to reduce total life cycle costs.

The methodology employed to attain these goals includes studying and developing a comprehensive roof management approach based on the tenets of the Unified Facilities Criteria 3-110-03. The Corps of Engineers' Louisville District was enlisted to assist ARIMD in program implementation. In particular, Kathy Sweeton, a registered architect and the Corps' only registered roof consultant, provided initial coordination in developing the strategic plan to meet NRI goals and UFC requirements.

The result was the award of two contracts for roof replacements that are fully warranted, including both material and labor, for 20 years.

Contracts

The first was a multiple award task order contract with registered roof consulting firms, which are companies with expertise in solving building envelope problems. ARIMD believed that using industry professionals was critical to ensuring roofs perform for their intended useful life *and* wanted all building envelope issues addressed — not just roofs. So, ARIMD tasked the RRCs to develop

| Acronyms and Abbreviations | |
|----------------------------|--|
| ARIMD | Army Reserve Installation Management Directorate |
| IMCOM | Installation Management Command |
| MATOC | multiple award task order contract |
| NRCA | National Roofing Contractors Association |
| NRI | National Roofing Initiative |
| RRC | registered roof consultant |
| UFC | Unified Facilities Criteria |

guide specifications based on the UFC "preferred" systems and construction details that meet or exceed the NRCA standards. The guide specifications are derived from roof systems that have been performing in the field for at least 20 years.

The RRCs also performed initial building envelope and roof surveys and developed roofing specifications that comply with the guide specifications. Roof data was compiled in ROOFPRO 4.3, a commercial off-the-shelf software. The program prioritized reroofing projects, developed budgets, tracked warranties and spotted trends.

This step has proven to be a vital part of the NRI, because it gives commanders accurate information on which to base decisions. The MATOC also provided for registered roof observers to oversee roofing construction, a quality assurance measure to ensure contractor compliance with the specifications and details.

A second MATOC was developed for roofing contractors. These contractors were qualified by confirming their

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a spreadsheet listing the damages by building or location and a memorandum from the garrison commander through the regional commander.

Challenges

The federal government is essentially self-insured in certain important areas, primarily loss of, or damage to, government property and the liability


of government employees insofar as the government is legally responsible or would ultimately bear the loss.

The damages at Fort Leonard Wood nearly drained the withhold amount for storm damages. The damage estimates out of Fort Bragg, Fort Campbell and Redstone Arsenal exceeded the withhold amount.

Since the government doesn't control the weather, there is no way to forecast the

amount of money that will be required to repair damages caused by Mother Nature. It is conceivable, with the amount of sustained storm damages in recent dates that the money will run out.

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membership in the NRCA for at least three years and providing proof of certification to install 20-year No Dollar Limit-warranted roofs by at least one manufacturer of modified bitumen, built-up, PVC and EPDM rubber roofing materials. Finally, contractors were required to self-perform all the work

The 20-year No Dollar Limit warranty is the best in the roofing industry. Almost every material manufacturer in the industry offers it, allowing for ample competition.

Results

The NRI program covers more than 5 million square feet of roofing. In the 11 years since the program's inception, there have been 14 confirmed roof leaks caused by faulty workmanship. All were repaired at no cost to the Army Reserve. There have been no material failures. The 20-year roof warranties for labor and materials have been upheld at no cost to the Army Reserve.

The roofs on two buildings at the Army Reserve's facility in Houston provide an example of NRI's success. The two roofs were comparable in every way except that one roof was replaced to NRI standards while the second was not. In 2008, the Houston facility was subjected to

Hurricane Ike, which caused major structural damage to many buildings in the Houston area.

During the hurricane, one of the two roofs was damaged, and the building suffered more than \$350,000 in repair costs. That roof had not been replaced to NRI specifications.

The other roof had been designed to meet NRI standards requiring greater wind uplift resistance. It suffered no damage during the hurricane.

NRI roofs have weathered hurricanes Ike, Katrina and Gustav without failure. The initial higher cost of installing roofs using industry best practices is more than offset by their longer life cycle, not to mention the reduction in collateral damage to building contents.

Once an asset's total life-cycle management costs are understood, it is easier to select the best strategic option for maintaining existing facilities. High-performing roofs are a key sustainment practice in maintaining and even improving infrastructure.

As another example of NRI standards, a roof's parapet wall can be covered with a heavy membrane sheet, making it



This Army Reserve complex roof in Houston, which had not been replaced under the NRI, shows considerable damage from Hurricane Ike in 2008. Photos by Bud Lewis

waterproof, even before the metal coping cap and panels are installed. The metal will protect the membrane from ever weathering, making the parapet wall waterproof for the life of the building even if water penetrates the coping cap. When the roof needs replacement, the counter-flashing and the metal flashing at the bottom of the parapet can be removed, new base flashing installed and the counter-flashing re-attached — never touching the wall. As an option, the roof can be left in place, and an additional cap sheet can be installed with a 10-year No Dollar Limit warranty, resulting in a total of 30 years of service. This is true sustainment design.

Using available funding to install high performing roofs will reduce life-cycle costs, eliminate roof leaks and maintain roofs in a green condition. *ARIMD's Guide Specifications and Construction Details* is in its 12th year of use and is field proven. ARIMD will gladly share this information with anyone interested.

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Bud Lewis is the NRI program manager, U.S. Army Reserve. 🇺🇸



With the roof blown off in background, this roof at the Houston Army Reserve complex, which had been replaced using NRI standards, shows no hurricane damage.



Nonhazardous Solid Waste Program tackles challenges

by Michael Andres

Installation Management Command faces multiple challenges in managing the Nonhazardous Solid Waste Program. Both on- and off-installation landfills are reaching capacity. Disposal costs are escalating, and stricter solid waste and recycling regulations are being promulgated.

The collection of solid waste is not a new activity for IMCOM installation; however, it is an area that requires constant adjustments to meet rapidly changing requirements.

Municipal solid waste, as it is called, has traditionally not been properly accounted. Most installations rely on data submitted by contractors that may not reflect actual conditions, and minimal recordkeeping makes it difficult to differentiate between MSW and construction and demolition waste in the waste stream.

C&D waste is material produced during construction, renovation, demolition or deconstruction. It includes residential and commercial buildings and their infrastructure, and its components typically include concrete, wood, metals, gypsum wallboard, asphalt and roofing material. Materials are considered C&D waste if they would normally be hauled to the landfill for disposal.

The goal of diverting C&D waste from landfills has obstacles. The construction industry is resistant to change. Contract specifications are often not written properly to account for the right types of waste and diversion goals. Recycling markets are limited, and there is a lack of awareness along with a perception that recycling will cost more.

Every IMCOM installation should have already implemented an Integrated Solid Waste Management Program. The ISWMP should describe:

- the generation, collection and disposal of solid waste;
- the statutory and regulatory requirements; and



Michael Andres
Photo by Grace Andres

- the plan of action to reduce and divert all types of solid waste.

Diversion goals

The fiscal 2010 IMCOM MSW diversion rate was 7 percent below the diversion goal. In addition, out of the 88 IMCOM managed and supported installations, 52 did not meet the FY 2010 MSW diversion goal of 40 percent.

The FY 2011 solid waste diversion goals require eliminating waste by adhering to the aims of Executive Order 13514 and the Department of Defense Strategic Sustainability Performance Plan. The executive order promotes pollution prevention and elimination of waste by minimizing the generation of waste and pollutants through source reduction. It establishes the goal to divert 50 percent of MSW and C&D waste by 2015. The FY 2010 DoD SSPP set annual diversion goals that will place the agency on a glide path to achieve 50 percent diversion for MSW and 60 percent for C&D by 2015.

The assistant secretary of the Army for installations, energy and environment has also implemented a goal of net-zero waste. A net-zero waste installation is an installation that reduces, reuses and recovers waste streams, converting them to resource values with zero landfill over the course of a year. The components of net-zero solid waste start with reducing the amount of waste generated, repurposing waste, maximizing the recycling of the waste stream to reclaim recyclable and

| Acronyms and Abbreviations | |
|----------------------------|---|
| C&D | construction and demolition |
| DoD | Department of Defense |
| FY | fiscal year |
| IMCOM | Installation Management Command |
| ISWMP | Integrated Solid Waste Management Program |
| MSW | municipal solid waste |
| SSPP | Strategic Sustainability Performance Plan |

compostable materials and recovery to generate energy as a byproduct of waste reduction. Disposal is nonexistent.

IMCOM installations will have to make significant improvement to meet or exceed the solid waste diversion and net-zero goals.

Landfill closure

Landfills, while considered practical for now, are not a desirable long-term solution for containing solid waste, because they pose the risk of possible land, air and water contamination. Army policy gives preference to using off-site disposal facilities rather than expanding existing or constructing new facilities on post.

Only a few IMCOM landfills are still open and permitted to continue to operate. This permission is subject to re-evaluation at least every five years to determine whether this alternative continues to be the best choice. In addition, due to funding constraints, IMCOM is faced with the dilemma of postponing the landfill closure schedule. ▶



C&D debris are composted at the Fort Hood Inert Material Management Unit. Photos by Michael Andres



(continued from previous page)

When an Army landfill is within three to five years of its design and permitted capacity, the installation should begin planning and programming for closure and post-closure care in accordance with 40 Code of Federal Regulations, Part 258, Subpart F, Closure and Post-Closure Care, and all applicable state regulations.

Way ahead - beyond recycling

It's well known that recycling reduces solid waste. However, recycling is just one of the ways to reduce waste; other options are available. The most significant action we could take to break the current stalemate and make significant progress is to seek to keep waste from occurring.

Greg Kuhr, IMCOM G4 director of Facilities and Logistics, recommends adhering to the following facets of source reduction.

Establish and communicate alternatives – After an installation identifies the major components of its waste stream, ask what the alternatives to generating this waste in the first place are. The Public Works community needs a campaign against petroleum-based products such as plastic bags, plastic water and soda bottles, and Styrofoam containers. What alternative products and practices can be used? IMCOM can demonstrate federal leadership with a campaign to minimize these and other products.

Extended product responsibility – IMCOM can provide incentive to industry partners by mandating their responsibility

to remove wastes generated by their products. This would involve mandatory contract language for all purchases that would require suppliers to remove packaging waste or refund the government for its disposal.

Build strategic partnerships – Establish partnerships with the Army and Air Force Exchange Service; the Defense Commissary Agency; Morale, Welfare and Recreation vendors; and others to limit the introduction of waste while also partnering with the installation on recycling efforts. Garrisons can't keep fighting themselves by working to recycle products while other on-post agencies do not constrain the introduction of these products into the waste stream. In addition, there are likely significant advantages to combining waste diversion efforts on post to reduce overhead costs and increase recycling revenue with volume increases.

Another form of recycling is composting. IMCOM installations could cut their reliance on landfills by implementing a compost program. Composting is a means to divert large portions of the waste stream from landfills and provide materials for soil conditioning and landscaping.

IMCOM installations can be considered to be their own municipalities, because they generate a variety of waste material. According to the Environmental Protection Agency, yard trimmings, food scraps and wood constitute 34 percent of the MSW stream. These wastes are normally sent to the landfill but could become useful compost.

Joint Base Lewis-McChord, Wash., and Fort Hood, Texas, have demonstrated that composting can be accomplished in a simple way. The Fort Hood Compost Center is operated by the solid waste management services contractor. The center operates under an "exempt




The Lewis-McChord composting operation saves more than \$300,000 a year.

status." Only vegetative waste and manure from the stables are processed.

Organic waste at Lewis-McChord is primarily composed of food waste from dining facilities and food preparation areas, installation landscaping and maintenance, land-clearing debris, storm debris, wastewater treatment system-generated bio-solids and horse manure. It is regulated and permitted by the Tacoma-Pierce County Health Department and Washington Department of Ecology.

The indirect and contract labor requirements consist of management, regulatory oversight and permit management. The equipment operation and maintenance is the responsibility of the Public Works Operations and Maintenance Shop. The equipment used for organic waste management includes two front end loaders, a trommel screen, dump truck and horizontal wood grinder. The FY 2010 annual cost savings generated by organic composting and recycling at Lewis-McChord was \$319,255.

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| DoD SSPP Annual Diversion Goal | | | | | |
|---------------------------------------|------|------|------|------|------|
| Fiscal Year | 2011 | 2012 | 2013 | 2014 | 2015 |
| Goal | 42% | 44% | 46% | 48% | 50% |
| Annual Targets MSW 50 percent by 2015 | | | | | |
| Fiscal Year | 2011 | 2012 | 2013 | 2014 | 2015 |
| Goal | 52% | 54% | 56% | 58% | 60% |
| Annual Targets C&D 60 percent by 2015 | | | | | |



Army Transportation Infrastructure Program updates

by Ali Achmar

The objective of the Army Transportation Infrastructure Program is to “provide safe, reliable, efficient and cost effective transportation infrastructure systems and dams that promote the health and welfare of the Soldiers, Civilian employees, their Families, contractor workforce and retirees, and provide the capability for garrisons to accomplish assigned missions.”

The ATIP has an annual budget that ranges between \$7 million and \$8 million. These funds are used to determine the condition and identify deficiencies in Army transportation facilities and to train Army personnel.

By centrally managing and funding the program, a practice that started in 2006, the Army is able to comply with public laws and regulation for inspecting and evaluating these facilities. In the past, it had been difficult to determine which installations complied and which did not.

The Headquarters, Installation Management Command, leadership decided to centrally fund and manage the program for the following reasons:

- to gain efficiency;
- because decentralization in 1998 did not work;
- to ensure public laws and regulation are met;
- for consistency; and
- so that data can be retrieved from one source.

ATIP encompasses individual programs that cover Army airfield pavements, bridges, railroads, dams and waterfront facilities.

Army Airfields Pavement Evaluation Program

This program consists of 42 major airfields identified as critical category I, and noncritical category I. Each of these airfields has a unique mission that was identified by the U.S. Army Aeronautic Service Agency and approved for special



Ali Achmar
Photo by Mary Beth Thompson

pavement evaluation or inspection. All other airfields and heliports pavements are treated as normal pavement, according to AR 420-1, Chapter 7.

The airfield evaluation consists of two types:

- *Nondestructive testing* – This evaluation determines the structural integrity of the pavement. Critical-category airfield evaluation is done every five years, and noncritical category every eight years.
- *Visual inspection* – This inspection determines the Pavement Condition Index, which ranges from zero to 100 — failed to excellent, respectively. Critical category airfields are evaluated every five years and noncritical-category every eight years.

Army Bridges Safety Program

All Army bridges are considered open to the public, according to AR 420 -1, Chapter 7. The Army inventory is estimated to include around 1,891 bridges, according to the fiscal 2010 inventory.

Routine bridge inspection is required every two years by

| Acronyms and Abbreviations | |
|----------------------------|--|
| AR | Army Regulation |
| ATIP | Army Transportation Infrastructure Program |
| DPW | Directorate of Public Works |
| IMCOM | Installation Management Command |

Public Law 95-599, *Surface Transportation Assistance Act of 1978*, and 23 U.S. Code 151, *Bridge Inspection Standards*. Bridges are inventoried annually.

Because of the large number of bridges in the Army inventory, the garrisons were divided into two categories, assigned to either odd or even years, for inspection purposes. About one-half of the bridges will be inspected in the even numbered years, and the other half in the odd-numbered years.

The program also includes underwater inspections, fracture critical inspection, scour evaluation and load rating of the bridges.

In addition, IMCOM sponsors one bridge training course every year: Army Safety Inspection of In-Service Bridges. This course is offered by IMCOM under the DPW Academy.

Army Railroads Program

The Army inventory list for railroads exceeds 1,432 track-miles worldwide. The objectives of the program are:

- to perform detailed inspections every ➤



Army bridges are inspected every two years. Photo by Kenneth Renfro



(continued from previous page)

four years to determine mission readiness of track facilities for supporting Army Strategic Mobility,

- provide an estimate of materials and costs to repair tracks, and
- identify close-to-traffic conditions that require immediate attention.

In addition, regulations require an internal rail defect inspection every five years. This test identifies deficiencies inside the rails.

The program has two courses — Railroad Track Maintenance and Safety Standards with Certification, and Advanced Railroad Track Maintenance and Recertification. These courses are presented by IMCOM under the DPW Academy.

Army Dam Safety Program

The Army has 236 dams in its inventory. They consist of 179 low-hazard, 22 significant-hazard and 35 high-hazard dams.

Dam safety inspection and inventory are required by Public Laws 92-367, 104-303 and 107-310. The objective of this program is to capture all Army dams, perform dam inspection, and identify deficiencies and repair needs every four years.

For the first time ever, all Army dams meet the requirements of Federal Emergency Management Agency 93, *Federal Guidelines for Dam Safety*; and FEMA 145, *Dam Safety*. The high-hazard and the significant-hazard dams in the inventory have emergency action plans, and the low-hazard dams have standard operating procedures. Each has an owner's guidance manual and complies with its state's minimum requirements.

The program has one course, Dam Safety Inspection, which is offered once a year by IMCOM under the DPW Academy.

Army Waterfront Facilities Program

The waterfront program is a new

addition. Surprisingly, the Army owns waterfront facilities that require inspection per Unified Facilities Criteria 4-150-07.

These facilities are used for logistics and Army support for deployments, ammunition and supplies. They also provide dry docks for maintenance and repair of ships.

Twelve facilities have been identified throughout IMCOM. Three inspections have been completed, and two will be inspected in fiscal 2011.

ATIP website

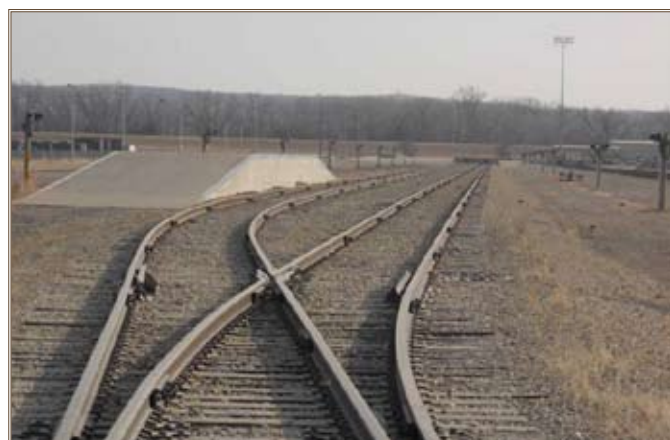
The ATIP website is on Army Knowledge Online at <https://www.us.army.mil/suite/page/583933>. It contains documents and information pertaining to the program such as inspection reports, training course information, inspection schedules, regulations, public laws and more.

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Army waterfront facilities fall under the ATIP. Photo by Mary Beth Thompson



Detailed inspections of Army railroad tracks are performed every four years. Photo by Michael Crawford



All Army dams must meet federal requirements for safety. Photo by Thandava Murthy



Transportation infrastructure: Make Triennial Review work for you

by Bernie Rodriguez

An Army garrison's Directorate of Public Works retains the role of ensuring safe, sound and reliable infrastructure. This level of quality is achieved and sustained through the application of resourceful maintenance practices and diligent programming for repair and minor construction.

Army Regulation 420-1 establishes the regulatory framework through which Headquarters, Installation Management Command, must observe, evaluate and assess quality and key management controls that are in effect at the garrison level. The observation, evaluation and assessment are done through the Army Transportation Infrastructure Program's Triennial Review, conducted by Headquarters IMCOM staff.

About 10 installations have been assessed against a management tool register that isolates controls and identifies successes and deficiencies in pavement, airfields, bridges, rails and dams.

General compliance is sought in areas such as timely pavement inspection reports and inventory, well articulated annual work plans, biannual dam inspections and emergency action plans. Along with staffing qualified technical managers in functional specialties, DPWs are responsible for regularly updating projects in the Project Prioritization System in



Bernie Rodriguez
Photo by J. Taylor

coordination with infrastructure condition assessments in the Installation Status Report.

These assessments allow Headquarters IMCOM to gain an idea of where challenges are surfacing and, in turn, to facilitate the best courses of action through the use of appropriate programming tools.

All inspections are performed in tandem with Army Transportation Infrastructure Program rail, bridges, dams and airfield pavement inspections. This system allows a practical venue for discussions concerning deficiencies identified in inspection reports and subsequent follow-up through local programming or through project prioritization at Headquarters IMCOM.

In general, installations have been found to be in compliance with

Acronyms and Abbreviations

| | |
|-------|---------------------------------|
| DPW | Directorate of Public Works |
| IMCOM | Installation Management Command |

infrastructure controls and regulations. However, common deficiencies are being found. Evaluations have established inconsistencies in the application of PAVER, the pavement maintenance management system, limited details and narratives in annual and long-range work planning documentation and inconsistent exercising of dam emergency action plans with local communities.

Certain garrisons have achieved success and maintained quality conditions by developing multiple strategies for the most beneficial use of available repair and maintenance funding. For instance, U.S. Army Garrison Fort Carson, Colo., made valuable use of its infrastructure quality indicators to develop on-time programming and execution of garrison road pavement improvements that were well synchronized with its Base Realignment and Closure program.

Accessible and serviceable transportation infrastructure is the result of proactive planning that makes full use of quality assessments and available programming tools.

Many installations have benefited from guidance that promotes proactive maintenance strategies and accuracy of programming and budgeting application systems managed by IMCOM. For example, various methodologies for pavement serviceability assessments are being employed across the IMCOM area of operation. Installations are being advised and have taken measures to standardize the use of pavement maintenance management, per Unified Facilities Criteria 3-270-08, for pavement surveys and quality ratings.

The end-state is intended to achieve cost-effective use of maintenance and repair requirements and to strengthen programming procedures by delivering accurate and timely data for Installation ►



Army dams such as the Lake Eustis Dam at Joint Base Langley-Eustis, Va., which has a roadway on top are assessed for regulatory compliance during Triennial Reviews. Photo by Dwayne Smith



The Army's waterfront facilities like these at the U.S. Military Academy, West Point, N.Y., are evaluated on a regular basis. Photo by Douglass Friend



General Fund Enterprise Business System update

by Deb Gonzales

There are many mixed feelings about the transition from the Integrated Facilities System to the General Fund Enterprise Business System. After all, IFS has been in existence for more than 30 years and will not be easily replaced within the culture of the Directorate of Public Works.

GFEBs is the result of the Army's need to replace its aging financial system and its desire to implement a cost accounting system and cost culture. This change is not foreign to the DPW community. Indeed, one of the functions of IFS work management is to provide for the capture of the costs to maintain and operate the Army's real property facilities and infrastructure. However, IFS is not integrally connected to the financial accounting system. The connection is made through a file sent to the financial system on a schedule set by the garrison.

Given that the DPW's Sustainment, Restoration and Modernization and Base Operations funding constitute a large portion of an garrison's annual budget, it is easy to see why the Army believes it is desirable to have an integral connection between real property maintenance and operation activities and the Army's financial accounting system.

GFEBs provides that integral connection.

IFS was created by government developers specifically for the DPW



Deb Gonzales
Photo by Mary Beth Thompson

community. GFEBs is a commercial off-the-shelf product that is being configured for use by the entire Army staff. The Army's objective is to utilize the commercial product to its fullest extent with as little customization as possible.


Although it may not seem so to the DPW user, the Plant, Property and Equipment modules are actually areas in which a great deal of customization has occurred. Even with this customization, the biggest challenge is to relate GFEBs terminology to IFS terminology.

GFEBs is not intended to change the basic business processes within the DPW but is the new tool to be used to implement those processes. The successful implementation of GFEBs requires a careful examination and evaluation of your existing business processes.

The deployment of GFEBs at garrisons with contracted SRM and BASOPS

installations an occasion to receive on-site evaluations from Headquarters IMCOM staff and presents garrison staff with an opportunity to share cost-effective solutions and common practice in the sustainment of key infrastructure.

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| Acronyms and Abbreviations | |
|----------------------------|--|
| BASOPS | Base Operations |
| DPW | Directorate of Public Works |
| GFEBs | General Fund Enterprise Business System |
| IFS | Integrated Facilities System |
| SRM | Sustainment, Restoration and Modernization |

activities brings additional challenges. The two most common issues that must be addressed are the timing to move the contract to GFEBs and the requirement to obtain maintenance information at the facility level.

The recommended time to move contracts to GFEBs is the first new contractual period of performance, either the base year or the option year of the contract, after GFEBs goes live at the garrison. However, that does not preclude the garrison from modifying the contract to move to GFEBs at any time after going live.

Obtaining facility-level maintenance costs is a much more complex issue. Many of the contracts were written with the requirement to obtain data at the Common Levels of Support or Installation Status Report service level. Headquarters IMCOM will continue to work individually with these garrisons to develop a successful strategy for the transfer to GFEBs.

IMCOM's goal is to provide one tool that can be used to capture data once with access available to all who need the data. It does not have the resources to support the myriad systems that are currently being used, a majority of which were developed to fill a void within the IFS capabilities.

GFEBs can perform all of the required capabilities to effectively manage real property maintenance and the base operations mission. The Public Works Division is working with IMCOM G6, Information Systems, to evaluate garrison requests for new or renewal of facilities-related information systems.

GFEBs has been deployed at 

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Status Report input and Project Prioritization System justification.

It is evident that knowledge sharing improves the sustainment measures at the garrison level. Successful programs consistently illustrate well-defined work plans with goals that identify predetermined infrastructure condition levels.

The Triennial Review affords



IMCOM headquarters moves into new home at Fort Sam Houston

by Francisco (Frank) Velazquez

Installation Management Command has a new home at Fort Sam Houston, Texas. The 2005 Base Realignment and Closure Act mandated the relocation of Headquarters IMCOM from Arlington, Va., to Fort Sam Houston by Sept. 15 this year.

IMCOM was activated Oct. 24, 2004, to apply uniform business structures to manage U.S. Army installations, sustain the environment and enhance the well-being of the military. Headquarters IMCOM oversees all facets of installation management, such as construction, Army Family housing, Family care, food management, environmental programs, well-being, logistics, Public Works, installation funding, and Soldier and Family morale, welfare and recreation programs. Its mission is to provide Soldiers, Civilians and their Families with a quality of life commensurate with the quality of their service.

The new IMCOM campus project's total investment is \$150 million and includes:

- construction of the Headquarters IMCOM building;
- renovation of a historic barracks for the Army Environmental Command;
- renovation of a historic barracks for the former Family and Morale, Welfare and Recreation Command, now inactivated and incorporated as IMCOM G9;
- renovation of the historic post theater for

the Army Entertainment Division with a 18,000-square-foot addition;

- construction of the Installation Management Community Academy; and
- renovation of, warehouse space for the Army Entertainment Division.

Headquarters IMCOM

The Headquarters IMCOM building, completed in June, reflects the traditional southwestern motif of the surrounding structures built in the late 1920s. The building provides a state-of-the-art office environment in 168,000 square feet of open space.

Its features include: more spacious cubicles with closet areas and additional shelving spaces; lights and data support connections ready for immediate laptop plug-in; indirect fluorescent lighting systems that reflect off white ceilings, reducing glare (and headaches); windows along the perimeter hallways that provide natural sunlight; open-air "collaboration areas" that are dispersed throughout each floor for meetings and production space; and two break rooms per floor. The new building will also provide 51 meeting areas — two in command suites and 15 large, 20 medium and 14 small collaboration centers in a cubicle arrangement; four elevators; two lobbies; a food court; four outdoor patios with tables and chairs; and one state-of-the-art operations center.

New parking allows for about 2,100 spaces to accommodate government

| Acronyms and Abbreviations | |
|----------------------------|---------------------------------|
| AEC | Army Environmental Command |
| BRAC | Base Realignment and Closure |
| IMCOM | Installation Management Command |

personnel in the campus area. Handicapped-accessible spaces are provided in all the parking areas.

AEC and G9

The buildings that will accommodate AEC and the G9 staff were originally built for the 9th Infantry regimental headquarters and barracks between 1928 and 1929. They are scheduled for occupancy Aug. 9.

The AEC building is a 110,235-square-foot structure that will provide 62,043 net square feet of administrative space. The renovation also includes: 14 conference rooms — one large, four medium and nine small; two break rooms; a 25-person computer training classroom; men's and women's restrooms and locker rooms; nine storage rooms; information technology and graphics labs; and two elevators.

The G9 building is a 114,538-square-foot facility that will provide 71,573 net square feet of administrative space. The renovation includes: 19 conference rooms — one large, six medium and 12 small; two break rooms; a 25-person training classroom; men's and women's restrooms and locker rooms; 10 storage rooms; and two elevators that will serve the space from the basement. ➤

(continued from previous page)

36 IMCOM garrisons as of July 1, when GFEBs went live in Germany. Deployment began at Fort Jackson, S.C., Oct. 1, 2008, and is scheduled for completion with the eighth wave of deployments in January. GFEBs has come a long way in the last 32 months, but there are always additional and future requirements to be met.


To manage the inclusion of additional

requirements, the GFEBs program has established a Functional Configuration Control Board that will be responsible for the analysis and prioritization of enhancements made to GFEBs. In the near future, Headquarters IMCOM will identify a process for the garrisons and regions to submit recommendations for improvements or enhancements to the board for consideration.

Transition to any new system can be an unsettling experience. Transition from

a system that has been an integral part of operations for more than 30 years is especially daunting. The Public Works Division will continue to provide support and assistance as needed to accomplish the transition as painlessly as possible.

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Army Entertainment Division

In addition, the historic Fort Sam Houston Theater is being renovated and expanded as the home for the Army Entertainment Division's "Soldier Show." The facility opened in 1935 as one of the first dedicated movie theaters built by the Army in the United States. It will become the new home of the Army Entertainment Division, which is relocating to Fort Sam Houston from Fort Belvoir, Va.

The renovated 14,692-square-foot theater will serve as the rehearsal hall for the cast of the annual production, while an 18,000-square-foot addition will provide theater support facilities, office space, recording studios and equipment storage. The project will alter the building's original movie-theater configuration to accommodate theatrical productions. The renovation work will extend the existing stage and modify the rear portion of the building to incorporate the 80-foot-tall fly

tower necessary to raise and lower stage sets.

The project is also creating: a green room, or performer's lounge; creative staff rooms; tool rooms; men's and women's dressing rooms and restrooms; a loading dock; audio and video production studios; a dance studio; costume storage and a laundry facility; as well as administrative space for the Army Entertainment Division's personnel and the elevator. The balcony seating will be removed to make room for lighting and sound equipment, reducing the theater's seating capacity from 1,100 to 800.

The building is scheduled for occupancy by Nov 1.

Academy

The Installation Management Command Academy, a new 28,000-square-foot facility, was completed in June.

The academy includes: eight classrooms with capacity for 216 students;

administrative space for staff; men's and women's bathrooms; a break room; student lounge area; storage rooms; IT and production labs; a conference room; and two reception areas.


Old, new and improved

In addition to preserving Fort Sam Houston's architectural character, the new and renovated structures that form IMCOM's new home were designed to standards necessary to achieve Leadership in Energy and Environmental Design Silver certification. With such features as natural lighting, super-efficient heating and cooling systems, waterless urinals and a rainwater capture system to feed drip irrigation to the native Texas landscaping, these facilities reflect IMCOM's vision for sustainable and environmentally friendly installations.

Ultimately, the goal is to preserve distinctive architectural features and maintain the historic nature of the buildings. Other renovation efforts will help meet anti-terrorism and force protection requirements, such as installing blast-proof windows that are designed to look like the originals.

As IMCOM moves into its new home, the BRAC 2005-directed move to San Antonio will be completed. IMCOM will continue to achieve its mission of providing Soldiers, Civilians and their Families with a quality of life commensurate with the quality of their service.

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This rendering shows the IMCOM campus at Fort Sam Houston. Graphic by Zeke Morrow



Prep academy at West Point nears completion

by Christopher Gardner

A typical large Military Construction project might involve building a barracks or a gym. Combine those facilities with three NCAA sports fields, an academic building with a dining facility that serves 300, and hard and fast deadlines set by Congress, and you've got the U.S. Military Academy Preparatory School, which the Army Corps of Engineers' New York District is constructing at West Point, N.Y.

The Base Realignment and Closure 2005 commission recommended that USMAPS, which has always had close ties to the U.S. Military Academy at West Point, be moved from Fort Monmouth, N.J., to the historic military academy's campus. The new 250,000-square-foot facility will accommodate 246 cadet candidates.

USMAPS, which prepares selected high school graduates and enlisted personnel for the academic, physical and military challenges of West Point, is being completed in two phases. Phase I was ready for occupancy in July and includes the barracks, dining facility, soccer field and indoor athletics field. Phase II is scheduled to be completed in January and includes the academic facility, athletics building, and the lacrosse and football fields.

Since the \$104 million project is part of BRAC, it comes with strict deadlines for occupancy and completion to ensure the smooth operation of USMAPS as well as the timely closure of Fort Monmouth.

"It is a BRAC project, with a critical completion date that is not flexible," said BRAC team leader Catherine Scott.

Cadet candidates must be able to occupy the Phase I facilities in early July to accomplish the BRAC initiative that requires closing Fort Monmouth by Sept. 15, Scott said. To meet that deadline and

keep the project on track, the team had to maintain an aggressive design and construction schedule for the various large projects that make up the complex.

That design included incorporating several green features to meet the U.S. Green Buildings Council's requirements to be certified Leadership in Energy and Environmental Design Gold. USMAPS will be the first LEED Gold facility at West Point.

"The garrison really wanted a LEED Gold facility," said Scott. West Point provided additional Operations and Maintenance Army funds to ensure the contract included language requiring that USMAPS would meet the LEED Gold criteria.

LEED credits for the facility are being earned through green construction methods and building sustainable features into the facility. The green construction methods include:

- using mechanical systems that optimize energy performance combined with an independent and enhanced commissioning of these systems;
- using regional construction materials that don't need to be shipped far; and
- incorporating environmentally friendly waste management techniques, like recycling debris from motor pool buildings that were demolished.

The facility itself will incorporate sustainable features, including reducing the water usage by nearly 40 percent through low flush toilets, some waterless urinals, efficient appliances and drought tolerant landscaping.

Before the facility's aggressive



The new U.S. Military Academy Preparatory School is being constructed at West Point by the Army Corps of Engineers' New York District. Photo by Dan Desmet, New York District

construction schedule could move forward, green or otherwise, a five-acre landfill had to be closed, which included constructing a flare building to burn off methane gasses from the landfill.

A municipal landfill wasn't the only hurdle for the team working on meeting the congressionally mandated deadline. West Point has been a military site for centuries and with that status comes the possibility of unearthing military relics.

"The [construction] site was also located within a former artillery firing range," Scott said. The team addressed the critical item of Munitions and Explosives of Concern during the design phase to ensure the safety of the site. A technical support team provided through the Corps' Baltimore District was present during the ground-disturbing portions of construction. The team found one mortar shell and one Civil War-era munition.

The Corps broke ground at USMAPS in September 2009, and construction remains on track. Cadet candidates will be able to arrive this summer, and the entire complex will be completed in early 2012.

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| Acronyms and Abbreviations | |
|----------------------------|---|
| BRAC | Base Realignment and Closure |
| LEED | Leadership in Energy and Environmental Design |
| USMAPS | U.S. Military Academy Preparatory School |



At Fort Benning, Corps to deliver Maneuver Center of Excellence

by Rashida Banks and Sandra Hudson

Among the Base Realignment and Closure projects at Fort Benning, Ga., is one that will bring to life the Maneuver Center of Excellence. The project will accommodate the melding of two of the Army's war-fighting disciplines — armor, moving from Fort Knox, Ky., and infantry, already at Fort Benning — by September.

The move will bring about 28,000 more troops, Civilian staffers, spouses and children to Fort Benning and the surrounding area. This number includes about 2,000 construction contractors of both small and large firms working on Armor School structures and training facilities at Harmony Church, one of the four main cantonment areas on Fort Benning.

“The Corps is doing a total renovation of the Infantry School's former headquarters building and transforming it into a state-of-the-art facility, which will coincide with the architectural elements of Fort Benning's historic Main Post,” said Alan Bugg. “The overarching concept of this facility is to bring infantry and armor together. They fight together and, therefore, should train and live together.” Bugg, the area engineer responsible for the MCOE Headquarters project, works for the U.S. Army Corps of Engineers' Savannah District.

This large-scale headquarters project, involving more than 520,000 square feet of space, includes an exterior remodel and interior reconstruction of an existing Vietnam-era structure. The expansion includes space for the Maneuver Center Capabilities Development and Integration

Directorate, the Directorate of Resource Management, the G8 Directorate and the technical library supporting the infantry and armor schools.

The \$135 million project was awarded in October 2008 to McCarty Corporation of Austin, Texas, and consists of two phases. Phase one, which began in October 2008 and is scheduled for completion in August, includes a complete exterior demolition and renovation of the tower, both wings and a 1,200-seat auditorium. Phase two, which finishes the renovation of the wings, is scheduled for completion in July 2012.

“To achieve the goal, the Savannah District and all its partners in this project had to think outside the box to provide the leadership and management resources to be in a position to deliver the facilities on time to the installation and ultimately the Soldiers and their Families,” said Joe Savage, senior project manager, Fort Benning projects.

To get the project right the first time and set the conditions for facilities being “Soldier ready” in time to meet the planned arrival of the mass influx from Fort Knox, the Corps and the installation developed the Fort Benning Integration Team. The integration team consists of planners, civil engineers, communication engineers, interior designers and environmental engineers.

This forward-thinking approach leveraged additional resources for the Benning program, facilitated the seamless transition from design to construction to installation ownership and, ultimately, to the Soldier who will be living and working in the new facility, Savage said.

The district and installation identified other gaps in the design and facility delivery to include information technology and

| Acronyms and Abbreviations | |
|----------------------------|-------------------------------|
| BRAC | Base Realignment and Closure |
| MCOE | Maneuver Center of Excellence |
| USACE | U.S. Army Corps of Engineers |

electrical interface with the modular furniture design, communication connectivity and red-zone to end-zone coordination with the installation.

The MCOE headquarters is one of the most visible projects on post, according to George Condoyiannis, one of the two Fort Benning area engineers. People who enter the Main Post can witness the progress every day, because it is close to the main artery.

However, it is only one of more than 250 building projects under BRAC that the Corps will turn over for occupation at Fort Benning within 24 months. Over the last three years, the Savannah District has spearheaded \$3 billion worth of construction at Fort Benning in direct support of BRAC and Army Transformation.

“While each individual design-build contractor was responsible for his project within construction limits, the integration function looked across the program to optimize traffic-roadway interface, utility coordination, drainage and stormwater, and site elevations,” said Condoyiannis.

The Corps' team at Fort Benning ramped up its presence five-fold over the last four years in preparation, said Condoyiannis, to execute the largest Military Construction program in the Southeast and provide the facility infrastructure that will further elevate Fort Benning's importance to the Army mission, training and power projection capabilities.

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The MCOE Headquarters undergoes a \$135 million renovation project. Photo by Cale Simons



Corps builds new home for 7th Special Forces Group (Airborne)

by Lisa Coghlan

Carved out of a forest of pine, oak trees and dense underbrush, the new cantonment area and training ranges for the 7th Special Forces Group (Airborne) is nearing completion at Eglin Air Force Base, Fla. As part of the 2005 Base Realignment and Closure Act, the 7th Special Forces will relocate this year from Fort Bragg, N.C., to Eglin, bringing at least 2,200 service members and their families to Florida's panhandle.

The U.S. Army Corps of Engineers' Mobile District is the design and construction agent for the huge project. The Corps' Construction Field Office staff comprises 36 people who are ensuring quality construction within BRAC timelines.

"We currently have more than \$300 million in awarded construction, which includes \$275 million on the cantonment and another \$25 million in 10 training ranges," said Major Zane Price, the deputy resident engineer in the Corps' Construction Field Office.

Another \$70 million will be awarded in the next two years, Price said. These awards will cover modifications and requests for future facilities.

The area is more than 500 acres, and 350 acres have been cleared for construction. More than one million square feet of construction is occurring simultaneously. There are 12 prime contractors and roughly 100 subcontractors on the site. On any given day, between 500 and 1,500 contractor employees are at work on various projects.

The Corps field office fosters close working relations with all contractors. All of the players have great pride in what they are building, Price said.

"All are agreeably working together harmoniously, a truly rare situation given the fast moving pace and magnitude of this entire project," he said. "How many times does one get the opportunity to build an entire new installation? The answer is, Not

many.' We are lucky and blessed to have such good contractors on this project with such a positive success story here."

The 7th Special Forces' new home will be unique in that the military members will train and prepare for future deployments without leaving the cantonment area. The Air Force Special Operations Command will be located on Eglin about six miles from the 7th Special Forces' cantonment site. This colocation will facilitate joint operations training and overall cooperation between the Army and Air Force special operations forces.

To build at the remote site, the Corps' first challenges were gaining access to the site, a former Air Force bombing range, and clearing the unexploded ordnance there before construction could start. The first project was building a permanent six-mile access road and a six-mile temporary road, which took six months.

The temporary construction road's base was built with recycled asphalt millings from other areas on Eglin. This base provided better dust control and a road that was capable of holding up to heavy construction vehicles and equipment over the two-year construction period.

Care was taken to identify and relocate the protected species of gopher turtles from the area. Green belts of trees, carefully marked with white bands during construction clearing, were left on site to provide habitat for the protected red cockaded woodpecker.

The wildlife presence has increased, especially the deer and turkey, Price said. They seem to like the new grass on which to feed and the new water sources due to the consolidation of water runoff retention ponds along this new road system.

"The turkeys can be seen from the road many days in very large flocks," he said. "They do not scatter anymore, which is incredible with their keen eyesight and their nature to avoid humans."

Facilities construction was divided

Acronyms and Abbreviations

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| BRAC | Base Realignment and Closure |
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The Corps of Engineers is constructing the new home of the 7th Special Forces Group (Airborne). Photo by Aero Photo

into four phases. The first phase, the group headquarters and one of the four combination battalion headquarters and company operations facilities, was completed in May. The second, third and fourth phases are moving along quickly. All of the construction must be completed by the BRAC deadline of Sept. 15.

All utilities had to be provided to the previously undeveloped site. A new electrical substation with six miles of overhead power lines into the cantonment, two 250,000-gallon elevated water storage tanks with wells, gas lines, 15 miles of sewage force main, and secure and commercial communications were built.

The finished cantonment will contain more than 35 structures and 10 ranges. In addition to the headquarters and the battalion and company operations facilities, there will be an indoor baffle firing range, a dining facility, a fitness training center and three barracks to house about 288 Soldiers. Other support facilities include medical and dental clinics, a fire station and other-use buildings.

Since this project was originally designed in 2005, the 7th Special Forces' Group's mission has grown. As a result, the plan for the facility's infrastructure was increased and built to allow for future growth.

The 7th Special Forces' training and mission capabilities will be enhanced



It takes a village to build a billion dollar project

by Christopher Gardner

Working on a \$1.04 billion project is never easy, particularly one as complicated as the Base Realignment and Closure project in Alexandria, Va., known as BRAC 133. However, the U.S. Army Corps of Engineers, New York District, is moving closer to the day when it will unlock the doors of the complex and provide government employees with a state-of-the-art facility from which to do business.

BRAC 133 — the 133rd recommendation in the BRAC 2005 law — resulted in the construction of two office towers of 17 and 15 stories respectively, two parking garages with 3,750 spaces, a visitor center and a remote inspection facility for security. To get the project completed by its September deadline requires a large number of people working in unison.

“It’s pretty impressive how many people are involved in the successful construction of this building,” said Sean Wachutka, BRAC 133 program manager.

An estimated 1,500 people are working in synch every day as part of the construction. Those people are engaged in every job from planning and project management to installing drywall and electrical work and planting environmentally friendly landscaping. Together, they are carrying out more than \$1 million a day in work.

The daily strength of general construction workers on site averages about

1,220. That number includes supervisors, carpenters, steelworkers and heavy machine operators among others required to construct the massive facility.

The building still needs to be fitted on the inside to be ready for duty. Among the tasks, wiring and cabling for phones, computers and security need to be installed. About 200 to 250 people carry out that work every day. The computer cabling alone totals more than 700 miles, which would stretch from the complex in Alexandria to Chicago.

No massive office complex is ready for service if it’s empty, which is why New York District awarded \$33 million in contracts to furnish the facility. The furniture selection, procurement and installation work is being managed and carried out by an additional 70 people, not including production and delivery of the furniture.

Support services also play a key role on this type of project, whether it’s personnel issues handled by human resources or procurements issues that are performed by the Corps’ Real Estate Division. About 50 civil servants and contractors working in New York District’s BRAC 133 Integrated Program Office in Alexandria serve as the primary POCs for oversight and management. The office is staffed with many of the specialty skills needed by a project of this size and complexity including engineers, designers, planners and architects. On top of making sure the entire project runs smoothly, there are many supporting tasks on which people work that range from transportation issues



Dwayne Queen, an insulator with TBN-TRA Insulators, installs pipe insulation in the BRAC 133 project site at Mark Center in Alexandria, Va. Photo by Marc Barnes, Belvoir Integration Office, USACE

to programming of office space by agency to ensure all needs are met.

The project is being constructed by Duke Realty of Indianapolis. Jason Betteker of Clark Construction Group, a subcontractor, provides day-to-day management of the firm’s project team.

“It’s been a great collaboration and partnership between the Army Corps and all of the contractors,” Betteker said. “Not that it’s miraculous or amazing, it’s just the attitude everyone brought to the project two years ago. We faced the challenge to get the project completed as a team. This is a testament to where we are today. The project is on schedule, has a first rate security record and is saving a lot of money. In the end, we’re going to have a happy client in a world class facility.”

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Acronyms and Abbreviations

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| BRAC | Base Realignment and Closure |
| USACE | U.S. Army Corps of Engineers |

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by its new cantonment area in Northwest Florida.

“This Special Operations Group will become the show place for all Army Special Forces Groups, and many predict that it will become the assignment of

choice for Special Forces Soldiers who proudly wear the green beret,” Price said.

“I tell our staff and contractors this is something to be proud of, and we will all be talking about the contributions we have directly been involved with toward our nation’s national security objectives. To be able to bring this project in on time and

within budget gives us all a huge source of pride.”

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How Fort Carson is modernizing physical training facilities

by Ryan Brown

Today's American Soldier must be fitter, stronger and more agile than ever before to sustain combat operations in some of the world's harshest environments. Soldiers are being asked to carry tremendous amounts of weight on their bodies while moving great distances on foot, all while fighting a skilled and adaptable enemy. At the core of accomplishing this mission is the physical fitness of each Soldier.

The 4th Infantry Division Staff and Fort Carson, Colo., Directorate of Public Works recently embarked on an integrated effort to standardize and modernize physical training facilities for Fort Carson's Soldiers. Both organizations desired standardized facilities that would be identical across the installation. Also critical were facilities built to last and that would require little maintenance.

The design process included several iterations with full-scale mock-ups to solicit feedback from officers and noncommissioned officers of all ranks. This feedback was critical in developing facilities that Fort Carson Soldiers would be excited to use.

Physical training areas

The first facility 4ID requested was an outdoor, all-weather, standardized physical training area that incorporated several types of equipment for muscle strength and endurance exercises. The intent was to provide a full-body workout for a platoon sized element of 30 to 40 Soldiers.

The 4ID staff and the Fort Carson DPW agreed to an equipment set that has a 50-foot-by-70-foot footprint and includes a 30-foot tall rope climb, pull-up bars, dip bars and sit-up bars. Each piece of equipment is constructed out of powder-coated steel pipe that requires minimal maintenance.

Also included is a 20-foot-by-50-foot area of open space that provides Soldiers with room for weight training and cross-training exercises. This cross-training area includes two weatherproof and securable lockers and a concrete wall of varying height to conduct plyometric exercises.

The perimeter of the physical training area is a vertical concrete curb. The surface is three-eighths-inch pea gravel, and the physical training area has an under drain system to prevent standing water.

Fort Carson has constructed 10 of these physical training areas at strategic locations throughout post. Another two are under construction.

Combatives training areas

The second facility that 4ID requested was an outdoor, all-weather, standardized combatives training facility. The intent was to provide a covered and lit area for a platoon-sized element to conduct combatives training year round.

The 4ID staff and Fort Carson DPW agreed upon a facility that includes a 50-foot-by-50-foot pre-engineered steel shelter with a 32-foot-by-32-foot rubber mulched training area enclosed by a rubber flex curb perimeter. The overhead shelter has surface mounted lights that illuminate the training area during hours of limited visibility.

Although this facility is designed to be used for combatives training, it can be used for physical training activities such as administering the push-up and sit-up portion of an Army Physical Fitness Test or for a myriad of different training events.

Fort Carson has completed the construction of one combatives training facility. Three more are under construction.

Siting

Selecting sites for these facilities was one of the most critical phases of the design



Fort Carson's standardized physical training area offers several types of equipment for muscle strength and endurance exercises. Photo by Susan Galentine, Directorate of Public Works, Fort Carson

process. Wherever possible, Fort Carson DPW colocated combatives training facilities with physical training areas. It is common to see units going back and forth from one facility to the next during a typical physical training session. Each physical training area and combatives training facility is strategically placed in the areas with the largest population of Soldiers.

Fort Carson DPW also strived to locate the physical training areas and the combatives training facilities along the installation's network of running trails. This placement allows units to depart their company operations areas on foot and easily navigate to the physical training facility of their choice.

The Fort Carson standard physical training areas and combatives training facilities, along with Fort Carson's extensive running trail network, provide its Soldiers with the resources necessary to develop a fully customizable and cutting edge physical training program.

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Acronyms and Abbreviations

| | |
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| 4ID | 4th Infantry Division |
| DPW | Directorate of Public Works |



Fort Irwin builds LEED Gold child center, net-zero facilities

by Hossam Kassab

Fort Irwin, Calif., achieved Leadership in Energy and Environmental Design Gold certification for its \$8.5 million, state-of-the-art child development center in April. This project provided a 232-child-capacity facility for children ages 6 weeks through 5 years.

Fort Irwin and the National Training Center have about 17,000 personnel on site with more than 7,000 Family members. The previous CDC was outdated and inadequate.

The project's goal was to provide a safe, secure and age-appropriate indoor and outdoor activity space. In addition, visual control of the entire building was desired to aid staff members in facilitating programming and supervising children and their activities.

The CDC is the first Fort Irwin and the first Los Angeles District project to be certified LEED Gold by the Green Building Certification Institute. Achieving LEED Gold reduces the construction's impact on the environment and lowers the maintenance costs through efficient energy and water savings for the installation. Also, this achievement is on the right track for Fort Irwin to reach its goal to become a net-zero installation.

The facility was designed and built to strict U.S. Army Corps of Engineers' Center of Standardization criteria. The contractor, RQ Construction in joint venture with Richard Brady and Associates,



High-efficiency central plant pumps are in place at the Fort Irwin CDC.

created a hybrid plan that incorporated the desired improvements.

RQ-RBA JV used Building Information Modeling software to accomplish the in-house architectural design. This strategy enabled the team to construct the CDC in 10 months and within budget.

The contractor also used a unique, light-weight exterior wall system that was integrated into the in-house design department's processes. This system was selected for optimal energy performance, innovative design and architectural capabilities, expeditious construction and reduction in costs.

RQ-RBA JV implemented flow-and-problem-prevention daily work planning. This tool proved to be effective in coordinating daily work schedules to prevent problems before they occurred in the field.

Fort Irwin has several other projects in final phases that will be LEED certified and energy-efficient facilities. Also, Fort Irwin continues building net-zero buildings. A net-zero energy building requires no electricity from the commercial electric grid, because it produces enough electricity to power all of its electrical needs. The post's second net-zero building was completed in April.

Fort Irwin is committed to conserve energy and is looking into various projects focusing on solar thermal electric power generation, wind power generation and a waste-to-energy power plant.

One of its many renewable and energy-efficient projects is a 6,000-square-foot prefabricated steel building used for ammunition storage that has its electrical needs supplied entirely by renewable energy. The building is not connected to the electrical grid and is totally self sufficient.

Sola panels on the roof supply 10.7 kilowatts of power. These solar panels are connected to a battery bank for power storage when the sun isn't shining. At

Acronyms and Abbreviations

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| CDC | child development center |
| LEED | Leadership in Energy and Environmental Design |
| RQ-RBA JV | RQ Construction and Richard Brady and Associates, Joint Venture |




Workers place concrete at the entrance to the Fort Irwin CDC. Photos by Paula M. Dolliver-Marshall, U.S. Army Corps of Engineers

maximum power, the interior overhead lighting, exterior lighting and fire alarm system consume only 8.2 kw of power, leaving more than 2.5 kw available for storage or use in the electrical receptacles.

Skylights provide most of the lighting throughout the day, so electrical lighting is needed only in the evenings. The battery backup storage has the ability to store 72 kw of electricity for use when the solar panels are unavailable or when more power is required for items plugged into the electrical receptacles.

The interior lighting uses high-efficiency light bulbs and is on timers that turn off the lights after use. The exterior lighting is also high efficiency and is coupled with a light-sensitive photocell, which turns on the exterior lighting only when it is dark outside.

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Air Combat Command partners with Corps' Sacramento District to develop Traffic Control Management System

by Thomas X. Sobolewski and Larry H. Dryden

The U.S. Army Corps of Engineers' Sacramento District, in partnership with the Air Force's Air Combat Command, developed an innovative system to comply with the Federal Highway Administration's requirements for establishing a traffic sign control management system.

The FHWA is responsible for instituting standards for the federal highway system. The most visible standards are the numerous traffic control signs seen on local, state and interstate highways. The uniformity that assures consistent application of highway controls and enforcement is promulgated thru the FHWA's *Manual on Uniform Traffic Control Devices*, available at <http://mutcd.fhwa.dot.gov>.

Late in 2009, an MUTCD update was published that established new requirements for retroreflectivity. Retroreflectivity describes how light is reflected from a surface, like a road sign, and returned to its original source, such as a vehicle. It refers to the property of a traffic sign to reflect light back to the driver. Maintaining retroreflectivity is important since nighttime fatal crashes occur about three times as often as daytime fatal crashes.

The 2009 MUTCD requires agencies to take actions to achieve phased compliance:

- By Jan. 1, 2012, establish a sign management system and procedures for maintaining retroreflectivity levels.
- By Jan. 1, 2015, have noncompliant regulatory, warning and ground-mounted guide signs replaced.
- By January 2018, have noncompliant

street name signs and overhead guide signs replaced.

To meet these requirements, Headquarters ACC's Sustainable Installations office formed a partnership with the Sacramento District's Geographic Information Systems and Mapping Section to create and populate a GIS-based Traffic Control Management System for ACC installations.

A team of GIS experts and civil engineers assembled a GIS database capable of storing relevant traffic control features in keeping with Spatial Data Standards for Facilities, Infrastructure and Equipment. This GIS database is the repository and basis of the TCMS, which can be used by installation personnel as a management and programming tool.

The TCMS includes sign attributes:

- location;
- type;
- dimensions;
- retroreflectivity values;
- condition;
- photo;
- inventory number;
- signpost type and condition;
- traffic light location, size and type;
- traffic barrier location, dimensions and type; and
- traffic counter location and study data.

The data collection used a handheld GPS, 35 mm digital cameras, a photo transfer system, a standard laptop and a retroreflectometer.

The effort includes four personnel in two teams. One team measures the sign size, height, road offset and retroreflectivity, affixes a barcode label and photographs the sign. The second team records the data on a computer and collects the GPS coordinates. This team also collects other traffic control device data, such as active vehicle barrier information and traffic



Team members check the retroreflectivity of a road sign during a traffic management controls survey. Photo courtesy of Sacramento District, U.S. Army Corps of Engineers

control signals.

Barcode labels are produced for each installation and assign a unique inventory number to each sign. Affixing barcode labels allows the use of a barcode reader in future updates or inventories.

The finished TCMS includes a robust GIS database with the location of traffic signs, signposts, traffic barriers, traffic lights and traffic counters for each installation. The database can be easily managed and maintained at the installation level and viewed on the ACC GeoBase Viewer.

The data model structure can be queried to produce a desired product or display. Possible uses include programming and budgeting for replacement signs. Data can be reviewed online, through desktop software, associated portal viewers or exported into a spreadsheet. Headquarters staff also has viewing access.

The Military Surface Deployment and Distribution Command Transportation Engineering Agency will conduct an engineering analysis of the finished product to assess the need for additions or changes to signs and the proper placement

| Acronyms and Abbreviations | |
|----------------------------|---|
| ACC | Air Combat Command |
| FHWA | Federal Highway Administration |
| GIS | geographic information system |
| MUTCD | Manual on Uniform Traffic Control Devices |
| TCMS | Traffic Control Management System |



How Picatinny is removing unsafe, contaminated buildings

by James B. Smith

Garrison commanders and master planners throughout Installation Management Command have been dealing with the question of removal of unsafe and contaminated production buildings for decades. Many installations have endured the numerous programs and policies that address the systemic problem, but creating lists and waiting for funding seems to only stonewall and paralyze efforts to remove these hazardous structures.

Like other installations, Picatinny Arsenal, N.J., has many contaminated structures that cannot be razed by the Facilities Reduction Program until they are decontaminated. For years, the structures have been on lists to be removed. Many date back to the age of the Toxic Environmental Cleanup program in the late 1970s and other such programs.

The Picatinny Defense Environmental Restoration Program team researched the problem, the programs and prevailing law to develop a proposed solution. The team's plan calls for decontaminating and razing more than 100 buildings, all to be addressed as a single effort.

The proposal consolidates the buildings into one project that lists the structure, history, contamination, proposed action

(continued from previous page)

of signs. The agency has endorsed the TCMS as a model system for use across the Department of Defense.

The team has completed four ACC installations and is scheduled to finish the remaining installations before fiscal 2011 close.

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Thomas X. Sobolewski is the chief, GIS and Mapping Section, Sacramento District, U.S. Army Corps of Engineers, and Larry H. Dryden, P.E., is the chief, Sustainable Installations, ACC.



and size of each. The proposal addresses the problem as a single effort rather than individual actions. Combining all of the facilities in one project should substantially reduce costs and duplication of effort.

Following approval from the U.S. Army Environmental Command and IMCOM, the team coordinated its efforts with the U.S. Army Corps of Engineers' Engineering and Support Center, Huntsville, Ala., which manages the FRP. The team developed a dual-pronged approach to address the removal of the structures.

The project will access two existing USACE contracts: Worldwide Environmental Remediation Services and the FRP. The contamination in the production buildings will be addressed by the former. After they are certified as "limited contamination," the structures can be razed mechanically and dealt with as standard demolition projects by the FRP.

The Environmental Restoration Program is the funding linchpin for DERP and the Building Demolition and Debris Disposal program. The DERP functions only with the support of IMCOM, USACE, AEC and the garrison command working together toward one goal.

The Picatinny effort will extend over several years and culminate with the removal of more than 100 buildings that have been deemed unsafe and potential point sources of contamination. It will revitalize the arsenal and safely remove about 152,787 square feet of building space that is currently presenting a real hazard to the safety of Picatinny's mission and personnel. The effort is a win-win for not only the mission but also the environment.

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James B. Smith is the unexploded ordnance safety and Military Munitions Response Program coordinator, Master Plans and Programs Division, Directorate of Public Works, Picatinny Arsenal.



| Acronyms and Abbreviations | |
|----------------------------|---|
| AEC | Army Environmental Command |
| DERP | Defense Environmental Restoration Program |
| FRP | Facilities Reduction Program |
| IMCOM | Installation Management Command |
| USACE | U.S. Army Corps of Engineers |



Equipment in the former High Explosive Nitration Building must be decontaminated as part of the removal process for unsafe structures at Picatinny Arsenal. Photos by James B. Smith



Picatinny's former Nitrating Building is part of a large project to remove contaminated and unsafe structures.



Fort Carson solves traffic problems despite limited funding

by Mark Hunsicker

Fort Carson, Colo., creatively employed limited Sustainment, Restoration and Modernization funding to alleviate traffic congestion created by its gains from Base Realignment and Closure and Grow-the-Army initiatives.

Fort Carson grew from housing three brigade-sized units in 2005 to housing seven brigade-sized units and several additional separate units. More than \$2 billion was programmed for new facilities to house the gaining units, but no funding was programmed for transportation infrastructure improvements to support a nearly three-fold increase in traffic resulting from the population growth.

Brainstorming

Fort Carson planners commissioned a transportation master plan, which identified \$50 million in road widening and intersection expansions to handle the increased demand. These requirements were well above SRM funding levels. The improvements were requested as part of several large corridor expansion projects but never gained support for Military Construction funding.

Sustainability planners crafted alternatives to ease the spiraling traffic congestion. Their easiest targets were single-occupancy vehicles and short on-post trips. Many creative ideas were developed including ride-sharing programs; staggered reporting and dismissal times; prohibiting trips off-post for breakfast, showers or lunch; bike sharing; carpooling; and collecting tolls and parking fees. Surveys showed very little support for these alternatives.

With no funding for the large projects or support for the feasible alternatives, Directorate of Public Works engineers looked for low-cost solutions that would

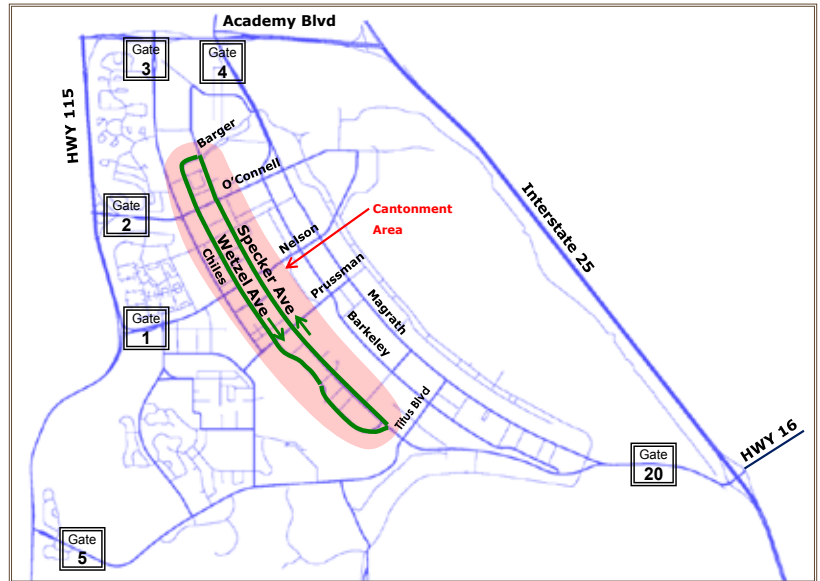
increase traffic throughput. The existing roadway network in the cantonment area was a grid of narrow streets typical in urban areas. Three major north-south streets extended through the densely developed area and were routinely in gridlock. These two-lane streets, about 2.5 miles in length, were choked by narrow geometry, mid-block driveways and all-way stop intersections.

Conveniently, two of these parallel streets intersected each other at the north and south ends of the cantonment area and were connected to each other at routine intervals by intersecting east-west streets. These two parallel streets could be easily converted to one-way traffic, similar to a counterclockwise track, to form a pair of higher volume corridors.

Benefits

A pair of one-way streets would improve traffic throughput by eliminating the number of conflicting movements, most importantly opposing left turns. One-way traffic would reduce conflicting left-turn phases from four to one at major intersections and eliminate opposing left turns at midblock driveways. It would also eliminate left turns that back up traffic where there are only two opposing lanes.

The change would reduce the number of all-way stops along the corridor, which would further increase traffic throughput.



A new traffic pattern helps alleviate traffic woes at Fort Carson. Graphic by Mark Hunsicker

Traffic along the cross streets would be improved by optimizing the signal phases. Since conflicting left turns would be reduced, the green time for left turn movements could be reallocated to the through movements.

Another benefit would be the addition of on-street bike lanes. The roadway, which had three narrow lanes including a center turn lane, would be restriped with two wider lanes and a bike lane. The bike lane would promote bicycle use for intra-post trips, helping to further reduce traffic congestion.

As a separate initiative, engineers performed a life-cycle cost analysis to select the most cost-effective pavement marking material for SRM roadway projects. The analysis determined that epoxy lane markings and thermoplastic markings proved superior to the traffic paint previously used. The conversion provided an opportunity to try the new material on a large project.

A known negative impact of a one-way traffic conversion is that some short trips may become longer. A destination that was just around the corner may require a longer drive down and back on the one- ➤

Acronyms and Abbreviations

| | |
|-----|---|
| DPW | Directorate of Public Works |
| SRM | Sustainment, Restoration, and Modernization |



Fort Hood renovates VOLAR barracks to improve Soldiers' lives

by Jill Alexander

Fort Hood, Texas, is home to the largest inventory of Volunteer Army-era barracks, commonly referred to as "VOLAR" barracks, in the U.S. Army. Its 35 VOLAR buildings contain 2,564 semi-private rooms. Fort Hood has 20 VOLAR barracks with a total of 1,504 rooms under renovation as part of a program aggressively run by the U.S. Army Corps of Engineers to improve all VOLAR barracks on post.

VOLAR barracks were constructed in the early 1970s to accommodate the all-volunteer Army following the ending of the draft. Generally, these barracks provide minimal living space for the Soldiers, about 76 square feet per person, with no individual bedroom area. They do not meet the current Army standard for living accommodations, known as the "1+1" standard, in which each Soldier has a private bedroom and shares a bathroom and kitchen with another Soldier.

Over the years, Fort Hood and the Army have placed a premium on the renovation of all VOLAR barracks to provide healthy, apartment-style barracks in which each

Soldier has a private room.

The 20 barracks undergoing renovations are expected to be completed and turned back to Fort Hood for occupancy in late summer. In addition, the Army just provided funding to Fort Hood to initiate renovations to another six barracks with a total of 408 rooms along with a central energy plant that serves these barracks. These renovations will also be managed by the Corps of Engineers. They are expected to begin this fiscal year and extend over a period of 24 months.

The remaining nine barracks with a total of 692 rooms and the central energy plant that serves them are in Fort Hood's plan to be renovated in fiscal 2012. That project's completion will mark the end of the VOLAR renovation program and ensure quality and healthful living spaces for all Soldiers assigned to VOLAR barracks at Fort Hood.

While this level of renovation is complex and requires a good deal of Operations and Maintenance funding, it is notably



An example of an unrenovated VOLAR barrack can be seen on the left behind this newly renovated VOLAR barrack at Fort Hood. Photo by Jill Alexander

less expensive than new construction. A comparable new barrack would cost \$15 million to \$20 million in most cases, while the cost to renovate and improve the existing facilities is less than 50 percent of that cost at around \$8 million per building.

Renovation of these 35-year-old facilities is expected to extend their building life at least another 35 years.

"In many cases, renovating these older barracks provides a substantially better value over new construction," said

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way streets. However, people may find it easier to walk on those short trips rather than drive, especially since open parking stalls are rare in the dense urban area. This result could further alleviate congestion by reducing short trips.

A study to analyze the conversion's effects predicted quantifiable improvements at all intersections as well as reduced corridor trip times and emissions. The one-way conversion would increase throughput by creating high-capacity traffic corridors with a minor amount of construction compared to the originally proposed roadway and intersection expansions. The conversion would also avoid the expensive side effects of roadway widening that include managing storm water on new impervious areas, mitigating

reduced building setbacks and relocating existing utilities.

Execution

Engineers planned the conversion for a four-day holiday weekend to minimize traffic disruptions. The actual work took only two days with sequential rolling road closures, several blocks at a time, in a continuous operation. The engineers monitored the new traffic patterns and added or modified signage and striping over the remainder of the weekend. Six existing traffic signals were modified from four approaches to three approaches.

The one-way traffic change was well publicized. Engineers used social-media sources at the installation including communitywide e-mail, website and Facebook postings, along with traditional newsprint articles, town-hall briefings and

public service announcements on local television. Engineers also erected variable message signs throughout the installation several weeks before the conversion.

Outcome

The conversion was a homerun. Despite some anxious days while drivers became accustomed to the new patterns, traffic through the cantonment area markedly improved. The improvement came at a tiny fraction of the \$50 million the corridor expansion projects would have cost and without adding pavement.

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Will McKerral, the Corps of Engineers' resident engineer. "Not only are these older structures very solidly built, but the individual rooms are larger and can be laid out in a more home-like manner. It would not surprise me at all if the renovated VOLARs became the 'barracks of choice' at Fort Hood."

The renovations to the VOLAR barracks take a holistic approach to the building's systems as well as improving quality of life for the building tenants. Not only do the renovations eradicate mold and moisture problems, they also result in minimized vapor transmission, improved energy efficiency and sealed building envelopes to improve living conditions.

The 20 barracks that are currently under renovation will achieve a 30 percent reduction in energy usage when renovations are completed and building occupancy resumes. This reduction will be achieved via improvements to an outdated traditional four-pipe central energy plant system; individual fan coil units in each living unit; double pane windows with low solar emission glazing; 30 percent solar domestic hot water; insulation in walls, roofs and crawl spaces; and cool roofs.

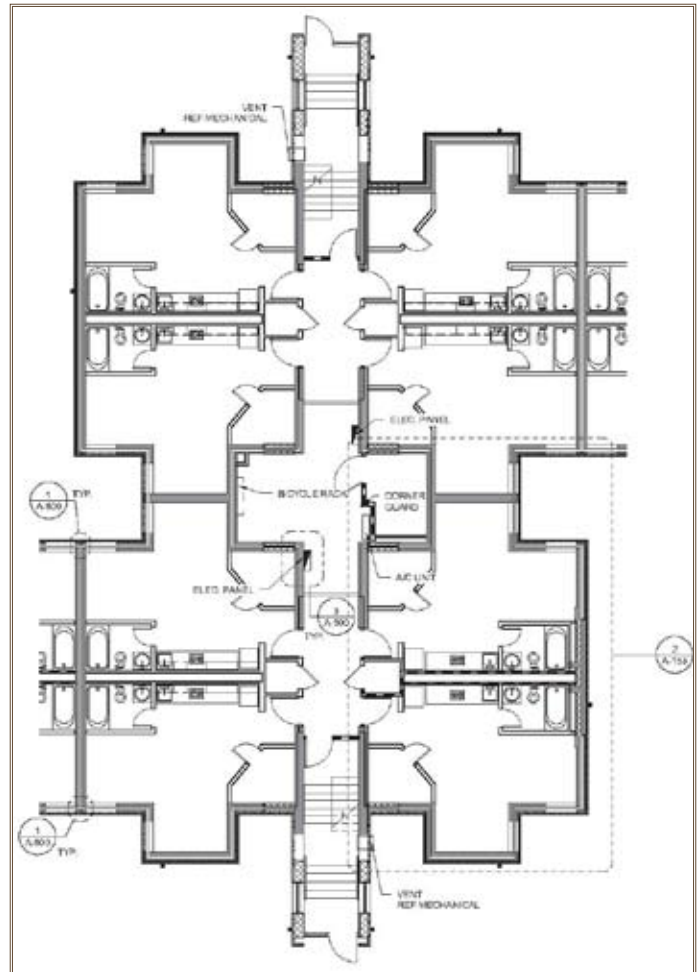
The upcoming renovations will result in a 40 percent reduction in building energy usage from the existing baseline, in accordance with American Society of Heating, Refrigerating and Air Conditioning Engineers 90.1-2007 standards. This reduction will be achieved by the installation of a water source heat pump and condenser loop central energy plant with hot water loop; ground-coupled well field for condenser loop heat rejection; individual heat pumps for each living unit in lieu of fan coil units; demand control ventilation; double pane windows with low solar emission glazing; 30 percent solar domestic hot water; high-efficiency lighting; LED parking lot lighting; insulation in walls, roofs and crawl spaces; and cool roofs.

In addition, dedicated outside air units will prevent the growth of mold and mildew, and improved site drainage features will capture storm-water runoff for all barracks under renovation.

The renovations will also achieve Leadership in Energy and Environmental Design Silver certification from the Green Building Certification Institute. The integrated project approach combines energy conservation measures, building commissioning, low-impact development techniques and improved indoor environmental quality.

"Our mission is to provide Soldiers and Families with a quality of life commensurate with the quality of their service," said Brian Dosa, director of Public Works. "Our renovated VOLAR barracks do just that for Soldiers at Fort Hood who have served numerous deployments to Iraq and Afghanistan. We are providing a home for our Soldiers that I would be proud to have my son or daughter live in. In these days when we are facing a fundamentally new fiscal reality, this is a wise investment of taxpayer money, as these renovations cost less than building new barracks."

The completion of the VOLAR renovation program will help the installation meet both long- and short-range energy efficiency goals and improve quality of life for Soldiers stationed at Fort



A floorplan shows the plan for renovating VOLAR barracks rooms. Graphic courtesy of U.S. Army Corps of Engineers

Hood.

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and you may be in our next issue.



Illinois Army National Guard rehabs historic armory

by Kip Troeger

The Illinois Army National Guard successfully demonstrated that, when certain criteria are met, the concept of *sustainability* can even apply to a rehabilitation project for an armory that is eligible for the National Register of Historic Places.

When compared to what a new readiness center would have cost, the Urbana armory rehabilitation project was completed with significant savings. In addition, having a field maintenance shop adjacent to the property and keeping the Armory on 22 acres of property in the heart of the city both played significant roles in the decision-making process.

The project also qualified for Leadership in Energy and Environmental Design Gold certification. Factors that contributed to its certification included construction activities that made the reuse of building materials a priority and the improvement of indoor environmental quality.

The Urbana Armory was built in 1938 as part of the national Work Projects Administration program. The building consists of a two-story gabled drill hall surrounded by one- and two-story sections that house classrooms, administration space, and vehicle and supply storage space. The drill floor was originally a dirt floor, as the structure housed the 106th Cavalry. In 1948, extensive remodeling replaced the dirt floor with a 200-foot-by-94-foot

wooden floor.

In February 1992, the Urbana Armory was recognized as architecturally eligible for listing on the NRHP. The Illinois Work Projects Administration armories are significant under Criteria A for their association with the historically pivotal New Deal-era public works building program and their combination of community centers and military design. The Urbana Armory is also significant under Criteria C for the artful blend of Art Deco and Art Moderne. Another notable element is the use of reinforced architectural concrete as the primary building material.

This rehab project began in 2010, but the groundwork to help ensure its success was laid many months prior to construction. The Illinois Department of Military Affairs recognized that it would be critical to seek the consultation of the Illinois State Historic Preservation Office early in the process.

Justification for altering this building was developed by researching prior adaptive modifications that were made to the building before it was determined eligible for the NRHP. These past changes were made to facilitate use by the troops, but they were not culturally sensitive. The newly proposed construction project offered an opportunity to restore much of the historic integrity of the armory while modernizing and increasing the efficiency of the facility.

A new armory would

Acronyms and Abbreviations

| | |
|--------|--------------------------------------|
| ILARNG | Illinois Army National Guard |
| NRHP | National Register of Historic Places |
| SHPO | State Historic Preservation Office |



A new structure is built inside the drill hall of the Urbana, Ill., armory. Photos by Kyle Blumberg, Illinois Department of Military Affairs

have been authorized to provide 6,300 square feet of drill floor space. Prior to the project, the drill floor square footage was 18,975 square feet. Through innovative design, a 12,000-square-foot, seismically isolated, three-story structure was constructed at one end of the drill floor.

This new structure is fully integrated within the building and looks as if it is part of the original structure. The first two floors contain office space, two vaults, locker rooms and break rooms. The third floor contains the mechanical equipment for the building. Extensive effort was made to ensure this new structure's integration with the historic accuracy of the original structure.

The rest of the building was also rehabilitated as part of this project. The primary and secondary views were brought back to the original exterior. The tertiary view added a balanced structure that complements the 1948 addition. The quaternary view was used to hide the back-up generator, two chilling towers and a transformer.

Great effort was made to promote a sense of historical sensitivity by all involved in this project, from the architect to the



The new structure within the drill hall provides needed facilities while preserving the original structure's cultural heritage.



Reducing water, chemical use in evaporative cooling systems

by Alfred Beitelman

An electronic capacitor-based water treatment system that uses no chemicals proved successful in demonstration and validation studies at four military sites. The U.S. Army Engineer Research and Development Center tested this technology over several years in side-by-side comparison with standard chemical treatment. As part of the project, a wireless, web-based monitoring system also was developed.

Chemical dilemma

For years, facility managers have sought workable alternatives to chemical treatment of water in evaporative cooling equipment. These systems, such as cooling towers and evaporative condensers, are the two most common ways of removing heat from industrial and commercial process equipment.

Evaporation of cooling water produces concentrations of mineral salts inherent to water supplies. In addition, nutrients from airborne sources and makeup water can allow microorganisms to build up in the recirculating cooling water, which can increase populations of disease-causing and system-clogging bacteria.

Improperly maintained water chemistry in cooling tower systems can result in the accumulation of mineral or biological deposits on equipment that can quickly reduce heat-transfer efficiency as well as

cause costly degradation of the system due to corrosion.

Historically, these destructive, expensive conditions have been controlled or prevented by adding specialty chemicals to the cooling water. These chemicals are hazardous materials and require special storage and handling.

Maintaining a proper balance of the chemicals in the system requires time and is subject to error due to water quality variations and equipment malfunctions.

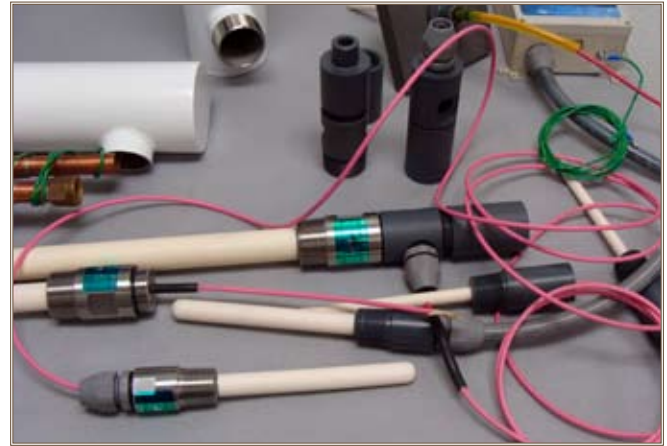
Coupled with these challenges is new legislation. Executive Order 13423 requires federal facilities to increase use of green technologies that save water and energy while not polluting the environment.

Evaporative cooling systems use a sizable amount of a facility's total water consumption, and chemically treated water discharged from the system must be treated, creating a significant load on the installation's sewage treatment system.

Not a magnetic de-scaler

The patented technology evaluated in the study is called the Zeta Rod. The system uses electrostatic dispersion of colloidal particles in a fluid by applying theories from colloidal physics and chemistry.

By inserting an insulated electrode or



Zeta Rods treat evaporative cooling water using electrostatic dispersion of colloidal particles in a fluid. Photos courtesy of ERDC

series of electrodes into a grounded pipe or vessel, a strong electrostatic field and corresponding capacitor are created. A conductive electrode inside the rod serves as one plate of the capacitor. The dielectric strength of the vitrified ceramic material that comprises the rod prevents electrical current flow to the other plate of the capacitor. The grounded metal of the pipe or vessel into which the rod is inserted acts as the other electrode in the capacitor.

When a high-voltage potential — 35 kilovolts direct current — is applied, the resulting electrostatic field reduces the water's surface tension and boosts the surface charge of colloidal particles and wet surfaces. Particles suspended in the water are caused to repel each other and to be repelled from other wet surfaces.

Through these physical effects, particles and bacteria that would otherwise combine to form scale or biofilms are dispersed and the potential for fouling is mitigated.

Field tests

ERDC's Construction Engineering Research Laboratory worked with Zeta Corporation and Directorates of Public Works at the demonstration sites to set up a carefully controlled comparison of the Zeta Rod system with conventional chemical treatment. ➤

Acronyms and Abbreviations

| | |
|------|--|
| CERL | Construction Engineering Research Laboratory |
| EO | Executive Order |
| ERDC | Engineer Research and Development Center |

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skilled worker. The good relationship that had been nurtured over many years with the SHPO was crucial to its success.

The result was well worth all the effort. The ILARNG rehabilitated a historic facility, protected an important cultural resource and has a state-of-the-art facility in which to train its Soldiers.

The Urbana Armory restoration project promotes sustainability and is good for the environment, the local community and the ILARNG Soldiers.

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The first phase, which began in 2007, was a 16-month demonstrations and validation project conducted at Fort Huachuca and Davis Monthan Air Force Base, both in Arizona, under a Cooperative Research and Development Agreement. These two sites were selected because of significant differences in the size of the cooling tower equipment available.

Two more sites — Fort Irwin, Calif., and Warner Robins Air Force Base, Ga. — were added later for an additional two-year project under the Department of Defense Corrosion Prevention and Control program.

This portion of the work continued the monitoring period of the existing systems and added the new locations with more extreme supply water chemistries.

Remote monitoring

The water management system for the project was developed with wireless remote online monitoring, data logging, alarm capabilities and control. System status can be determined remotely through a static Internet provider or wireless modem.

Remote monitoring provides access to all operational functions of the controller, allowing setting of different levels of

security and control of operations.

The system uses meters for measuring the cooling tower's makeup and blow-down water, providing documentation of actual gallons conserved. Real-time online corrosion monitoring provides valuable information on corrosion rates without the 90-day period required for corrosion coupons.

The monitoring system has been useful at all four locations on both the chemically treated and Zeta Rod-treated cooling towers. The data and alarm capability has detected malfunctions of blow-down valves, water wasting float valve settings, power failures at the sites and other situations that if left undetected could have resulted in wasted water or potential equipment damage.

Project update

More than 18 months into the second demonstration phase, both the Zeta Rods and chemical treatments have been effective in preventing scale buildup, biofouling and corrosion in the systems tested. For example, at Fort Irwin, with an average water hardness of 78 parts per million, no significant mineral deposits have occurred with the electronic treatment system.


To determine if the nonchemical treatment could reduce water usage, water meters were installed for the systems in the demonstration and validation project. By allowing higher mineral concentrations prior to blow down, the Zeta Rod system reduced the makeup water consumption by more than 20 percent and delivered a 50 percent reduction in wastewater.

The chemistry-free water discharged from Zeta Rod-treated towers can be

recycled for use as landscape irrigation or other gray water applications. These two water recycle strategies can help meet the water conservation targets set by EO 13423 and other green building strategies.

A detailed explanation of systems tested and data collected over the initial demonstration period may be found in an ERDC-CERL Technical Report, TR-09-20, at http://www.zetarod.com/pdf/erdc-cerl_tr-09-20.pdf.

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Zeta Rods are installed into grounded pipes or vessels, which serve as one electrode in the capacitor.



Simplified Total Energy Program evaluates garrison energy sources

by Ramanuja Kannan

The Engineering Branch of the U.S. Army Corps of Engineers' Fort Worth District developed an Excel-based tool called the Simplified Total Energy Program that compares the relative efficiency of energy sources and performs life-cycle cost analyses. Though STEP is still under development and is constantly evolving to include as many variables as possible, it has proven to be a powerful tool to evaluate various energy sources.

STEP differs from the Energy Engineering Analysis Program. EEAP analyzes energy usage. STEP evaluates energy efficiency in the earliest stages of design and provides a means of evaluating options. It is an analytical tool that evaluates economics and fuel efficiency, and performs life-cycle cost analyses.

STEP can be customized to individual garrisons with site-specific data. It also takes into account indirect energy-saving technologies, carbon footprint reduction, renewable energy sources and variable fuel costs. Unlike the EEAP, which relies on surveys of completed projects to identify potential energy savings, STEP allows the user to investigate all viable options and evaluate what-if scenarios.

With STEP, the Fort Worth District has the capability to assist users during the master planning stage and can save a considerable amount of time and design costs. STEP uses site-specific data in the analysis, so there is less ambiguity and uncertainty, providing the designer a guided approach. The cost of utilities, fuels and manufactured goods are factored in, so there is also less variation in cost estimates and fewer contract modifications.

STEP is set up to analyze wind turbines, solar water heater panels, solar photovoltaic cells, and combined heat and power. STEP also evaluates energy conservation measures such as skylights and energy-

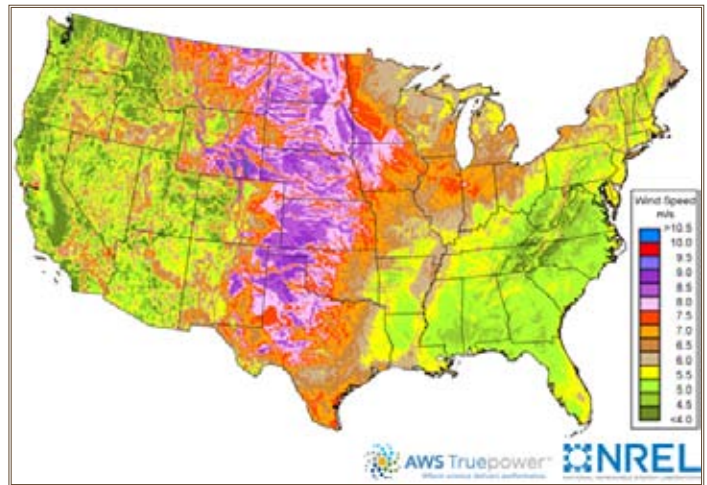
efficient windows. In the future, STEP will incorporate other resources such as biomass, coal, natural gas and propane, nuclear energy, renewable energy and residual energy reuse.

The STEP database compiles information in categories that form the input to the analysis. Each garrison is identified by its latitude, longitude, elevation, climate data and the cost of utilities available. Because many garrisons use the services of neighboring cities, data is collected from the adjacent cities as well.

A second data set pertains to the physical dimensions, type of construction, population served, facility function, water and electricity usage, available window and daylight conditions, and the climate zone classification. ➤



The gold area on an Army map shows the locations where solar energy provides a potentially good option. U.S. Army graphic



A Department of Energy map illustrates the potential for wind energy generation across the United States. Graphic by the National Renewable Energy Laboratory

| | Fossil Fuel Reduction | Fuel Reduction Percent | CO2 Reduction | Water Reduction | Cost | Cost per Percent | LCCA | Cost per Square Foot |
|------------|-----------------------|------------------------|---------------|-----------------|--------------|------------------|------|----------------------|
| 1 Wind | 5.28 | 2.14% | 67.82 | 50.41 | \$ - | \$ - | \$ - | \$ - |
| 2 SHWH | 4.71 | 1.91% | 46.79 | 0.05 | \$23,419.92 | \$ 13,346.14 | \$ - | \$ 0.49 |
| 3 PV | 2.61 | 1.06% | 23.88 | 21.04 | \$131,013.25 | \$123,484.58 | \$ - | \$ 86.58 |
| 4 CHP | | | | | | | | |
| 5 Window | | | | | | | | |
| 6 Skylight | 1.72 | 0.70% | 1.72 | (0.04) | \$5,2614.07 | | | |

This graph is an example of STEP output. Graphic by Bruce McMillan, U.S. Army Corps of Engineers

| Acronyms and Abbreviations | |
|----------------------------|-------------------------------------|
| EEAP | Energy Engineering Analysis Program |
| STEP | Simplified Total Energy Program |



Minimizing water down the drain

by Philip Columbus and Nadia Abou-El-Seoud

Urinals” is a topic that does not usually roll off the tongue during dinner-time conversation. However, it is a subject the Army has addressed and reassessed many times since fiscal 2006.

The use of nonwater urinals provides installations with an environmentally friendly way to save millions of gallons of water annually and to also greatly reducing sewage costs. These particular urinals use a biodegradable liquid and maintain a sanitary, odorless environment.

In 2006, the assistant chief of staff for installation management signed a memorandum, and an Engineering and Construction Bulletin was released, requiring the use of nonwater-using urinals immediately where appropriate on repair projects and for Military Construction projects beginning in FY 2010. However, in 2010, the American Society of Heating, Refrigerating and Air-Conditioning Engineers, with the Illuminating Engineering Society of North America

and the U.S. Green Building Council, published Standard 189.1, *Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings*, which provides criteria that must be met to have a building be considered green.

Standard 189.1 addresses the need to conserve energy, reduce sewage, improve water-use efficiency and protect the environment by allowing nonwater-using and low-flush urinals. The new standard varied from then current Army guidance.

To keep installations in line with other federal agencies, OACSIM rescinded the 2006 memo and published new guidance March 28 that requires Army installations to comply with Standard 189.1. The guidance is located on Army Knowledge Online within the Army Technology Standards Group section.

Both nonwater and low-flush urinals provide the best solution for conserving water, reducing sewage and maintaining

| Acronyms and Abbreviations | |
|----------------------------|---|
| ASHRAE | American Society of Heating, Refrigerating and Air-Conditioning Engineers |
| FY | fiscal year |
| OACSIM | Office of the Assistant Chief of Staff for Installation Management |

the environmentally friendly climate for which the Army is striving. Urinals, perhaps not dinner-time conversation, need to be addressed, because the Army must look beyond the present to the future.

The goal? To save water and reduce sewage. The solution? Minimize the amount going down the drain.

Standard 189.1 can be found on the ASHRAE website, <http://www.ashrae.org/>.

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A third data set includes equipment and hardware specifications for pumps, chillers, boilers, wind turbines, windows, skylights, insulation, roofing materials, water closets, lavatories, showers, washers and dryers. The unit consumption of these items is factored in the energy-efficiency calculation. The capital cost, depreciation and discount rate for these items are stored in the database, and the time value of money is accounted for.

A fourth data set is a multiplier that accounts for factors such as base carbon dioxide emissions and fuel costs.

The user interface starts with simple facility input. From this input, the database gathers pertinent information. STEP then calculates the economics of each type of energy source to determine the unit costs for energy usage. STEP also calculates the energy reduction, emission data and economics.

STEP output gives a summary for each energy system type considered. Calculated results are also ranked by the factors that influence design decisions.

Traditional energy calculations have relied on feedback from installations where one or more methods of energy efficiency have been adopted. This calculation would not always provide the best input for the design of a new installation if other alternatives are not considered. Furthermore, because of the geographical location, some sources of energy may not offer the best efficiency even if the cost and environmental impact are low.

Maps are available that show the U.S. locations where solar energy provides potential. For example, Fort Bliss, Texas, located in a high-potential area, successfully uses solar power generation. However, Midwestern states outside the high-potential area have successfully used solar water heating. Similar maps show

the Department of Energy’s estimates for potential wind energy generation. The central section of the country, from West Texas to Wyoming, offers the highest potential for harnessing wind energy.

Though such maps provide guidelines for a starting point, any location in the country could harvest as much wind and solar energy as is available in that area. STEP allows the user to evaluate these and other energy sources separately and compare each with other alternatives. It also evaluates a combination of different alternatives. With the extensive database already installed, any location within the 50 states can be evaluated.

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Sustainability assessments underscore need to conserve water

by Laura Curvey

A recent study, conducted by the Engineer Research and Development Center for the Army Environmental Policy Institute, addresses the Army's concern for long-term water supply and demand issues facing domestic installations.

For this study, 10 Army installations were chosen based on their watershed vulnerability index scores obtained from the Sustainable Installations Regional Resources Assessment tool; expected local and regional population increases; component commands; water use; and water cost per 1,000 gallons. Installations included in the study were: Forts Benning, Ga.; Campbell, Ky.; Carson, Colo.; Hood, Texas; Irwin, Calif.; and Riley, Kans.; along with Camp Shelby, Miss.; McAlester Army Ammunition Depot, Okla.; Joint Base Lewis-McChord, Wash, and the U.S. Military Academy at West Point, N.Y.

The analyses broke down water consumption throughout each installation and its region to create a baseline of demand factors. They also determined, at a watershed and regional level, where the water supplies to each installation originated, who else depended on these supplies and what factors may affect them.

From this baseline, researchers created five different scenarios demonstrating water supply and demand trends out to the year 2040. Each of the scenarios was tailored to address issues specific to that installation.

Factors affecting an installation's long-term water supply may include climate, surface or groundwater source, water quality, forecasted regional population growth, state water laws, contracted utilities and condition of infrastructure. However, each installation is also subject to Executive Order 13514, which requires potable water

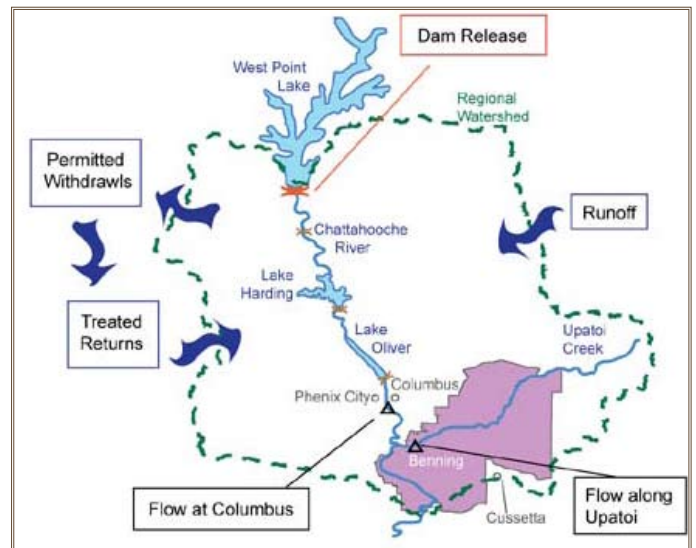
consumption to be reduced 2 percent every year from fiscal year 2007 to 2020, or by 26 percent by the end of FY 2020 using FY 2007 as the baseline.

Conclusions from the study suggest some common strategies every Army installation should consider to become more resilient:

- *Metering is the key* to determine baseline usage and a necessary first step to developing comprehensive strategies for reducing consumption. Many installations have meters only at point-of-source entrances, limiting user responsibility and increasing a culture of waste. Water meters will be required on installations by FY 2016. Although meters are expensive, installations can prioritize metering to high water-use activities and zones as they attempt to meet this deadline.
- *Leaks are significant sources of water and energy loss.* Conditions of water systems on Army installations are similar to the United States at large where 15 percent leakage rates are the norm. However, since the integrity of installation water systems is unknown, it is likely to be higher. West Point, for example, estimates a leakage rate of almost 20 percent. The lack of proactive leak detection



The Fort Carson regional demand model study region is depicted. Graphic by Ryan Holmes, ERDC-CERL



Fort Benning's water supply is displayed in this conceptual model. Graphic by MeLena Hessel, ERDC-CERL

programs coupled with limited metering cause the Army to lose an untold amount of potable water.

- *Operations and utilities systems contracts should incorporate water use, conservation and efficiency* as part of standards for maintaining and retaining potable water resources. Standard contracting language should be developed that requires measures to safeguard water resources and prevent loss. Several installations in the study were limited in their ability to conserve water or implement changes

Acronyms and Abbreviations

| | |
|------|--|
| CERL | Construction Engineering Research Laboratory |
| ERDC | Engineer Research and Development Center |
| FY | fiscal year |



Reuse of materials from modular, relocatable buildings

by Tom Napier

Modular, relocatable buildings built as temporary facilities to support Army Transformation, restationing, Base Realignment and Closure, and other directives must be removed within the very near future. Public Works Technical Bulletin 200-1-73, *Reuse of Materials from Modular, Relocatable Buildings*, provides guidance for removing these buildings economically and with least environmental impact. This PWTB is available at http://www.wbdg.org/cbb/browse_cat.php?o=31&c=215.

MRBs are used to satisfy facility requirements as a temporary measure until permanent facilities can be built with Military Construction appropriations. The classification of “relocatable” requires these buildings be removed within six years of their placement.

Since 2004, the Army has approved almost 10 million square feet of MRBs. The end of these facilities’ service requirement will occur between 2010 and 2016.

While the preference will be to relocate and reuse these buildings intact either on or off post, disposal in some fashion will probably be required as well. It will

be a challenge to remove the large number of buildings while meeting or exceeding the Army’s mandates for sustainability, construction and demolition waste diversion, and net-zero waste.

Alternatives to conventional demolition and landfilling can divert more than 75 percent of debris from landfills. Outlined in the PWTB are procedural guidance and supporting resources for removing temporary MRBs once their interim requirement ends while diverting debris from landfills. Building deconstruction — the disassembly of a building to recover components and materials for reuse, salvage and recycling — methods are addressed.

Although fundamentally similar, there can be some differences in construction methods between site-built and factory-fabricated buildings that would affect the potential for deconstruction and salvage. These differences are also described.

Information in this PWTB includes:

- descriptions of factory-built materials and construction features;
- material characterization of MRBs by facility type;
- reuse and recycling limitations and opportunities;



Modular, relocatable buildings that provided temporary structures while permanent facilities were under construction must be removed. Photo courtesy of the Corps of Engineers

- removal of buildings placed as personal property through the Defense Reutilization and Marketing Service;
- sale, demolition or deconstruction of buildings placed as real property;
- solicitation of services for building removal;
- C&D waste management planning; and
- C&D waste management references and resources.

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Tom Napier is a research architect, Engineer Research and Development Center’s Construction Engineering Research Laboratory, Champaign Ill.



Acronyms and Abbreviations

| | |
|------|---------------------------------|
| C&D | construction and demolition |
| MRB | modular relocatable building |
| PWTB | Public Works Technical Bulletin |

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because of language in their contracts with utility providers.

- Installations should be aware of their rights to water and the factors that may affect those rights. Competition for water and water rights is intensifying, especially in western states. For instance, until recently, Fort Carson could not legally collect rainwater for irrigation. Now, they may retain water for up to 48 hours for irrigation before returning it to the soil.
- Installations should take a holistic approach

toward water and energy conservation.

As water and energy are ubiquitous throughout installations, their commonalities often overlap. To have available water, you need energy. At the same time, installation energy processes often require water. For example, Fort Irwin, a desert location with severe restrictions for long-term water supplies, is planning to install a renewable energy project with a vast photovoltaic panels array. However, these panels need to be cleaned regularly with water for continuous efficiency. Unless the post discovers another

water source, the new energy supply will likely accelerate the depletion of their current water supply.

The findings for each installation are documented in a technical report available at: http://www.cecer.army.mil/techreports/ERDC-CERL_TR-11-5/ERDC-CERL_TR-11-5.pdf.

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Laura Curvey is a project coordinator and community planner, ERDC’s Construction and Engineering Research Lab, Champaign, Ill.





Bulletins describe tools and water websites

by Elisabeth Jenicek

A series of recently published Public Work Technical Bulletins provide tools and information to help Army installations reach water efficiency targets as they work toward net-zero water capability. The Watershed Screening Application of the Sustainable Installations Regional Resource Assessment tool and the Installation Water Demand Tool help evaluate installation water sustainability and inform development of water management plans. The Water Management Toolbox is a comprehensive web resource to assist Army installations in every aspect of water planning.

In recent years, military installations have been impacted by increasing demand and decreasing supply of high quality fresh water. Urban growth adjacent to installations combined with prolonged regional droughts places key military missions at risk due to limited availability of this vital resource. Regional competition for water threatens continued availability of adequate water both on post and in adjacent urban areas.

The U.S. Army recognizes the emergence of water scarcity as an issue of concern and includes water efficiency statements and goals in sustainability directives. New federal water management and reporting requirements, along with

increasing water scarcity in regions containing Army installations, make it imperative for installation staff to have ready access to the wide range of web resources, reports and tools that can support installation water conservation programs.

Watershed Screening Application

The Watershed Screening Application methodology screens watersheds containing Army installations for potential sustainment issues. The process identifies vulnerable watersheds that may require further study using local data sources.

The screening methodology contains 27 water supply and demand indicators derived from national data sets. Each indicator is evaluated on a scale of 1 to 5. These scores are added for an overall index of watershed vulnerability, which is used to produce a map showing a range of vulnerability.

Detailed information about the methodology and results, including example applications, is contained in PWTB 200-1-86, *Regional Water Availability Assessment Guidance*, available at http://www.wbdg.org/cdb/ARMYCOE/PWTB/pwtb_200_1_86.pdf.

Installation Water Demand Tool

The Installation Water Demand Tool predicts the water capacity, demand and supply requirements for an Army installation over a 30-year horizon. The model works on the premise that there are three basic categories of water consumers on the installation — residents, commuters and processes.

Inputs to the model include installation real property data, permanent population, commuting population, industrial tempo, deployment tempo, rainfall, evapotranspiration data and

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

planned construction. Outputs include a future water consumption estimate.

The tool allows development of alternate future scenarios based on expected growth, changing climate, conservation initiatives and changing cost. The documentation includes detailed instructions and two case studies.

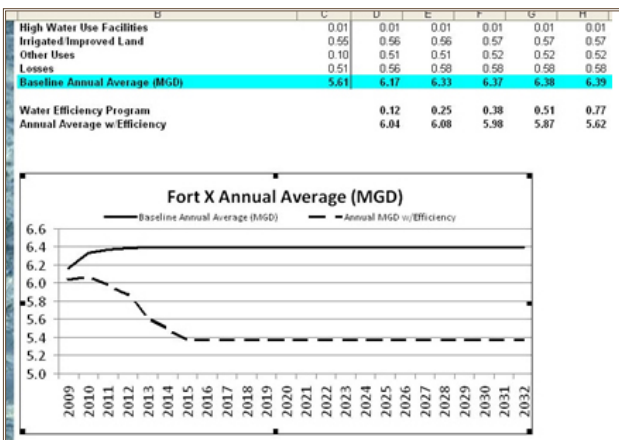
The Installation Water Demand Tool is documented in PWTB 200-1-85, *Installation Water Audit Guidelines*, available at http://www.wbdg.org/cdb/ARMYCOE/PWTB/pwtb_200_1_85.pdf.

Water Management Toolbox

The Army Conservation Collaboration Web Portal was created to help Army installations achieve the water conservation requirements of Executive Order 13514, *Federal Leadership in Environmental, Energy and Economic Performance*, and the *Strategic Sustainability Performance* ➤

13 Water Management Toolbox topics:

- Laws, Regulations and Policies
- Federal Implementing Guidance
- Water Management Topics
- Technology and Products
- Water Demand Projection Tool
- Data Sources
- Other Tools
- Regional and State Resources
- International Resources
- Other Resources
- Favorites
- News
- Water Management Forums



This screen capture shows the "Water Proj Summary" chart of the Installation Demand Tool, which depicts projected water demand over time. Graphic courtesy of ERDC-CERL.



Motion detection cameras monitor species at risk in western Mohave

by David Delaney

In an ongoing quest to find effective, noninvasive animal survey tools, the U.S. Army Engineer Research and Development Center tested motion detection camera systems at Fort Irwin, Calif., and surrounding areas. The goal was to learn if these cameras could provide good species data for the Mohave ground squirrel at a lower cost and with minimal habitat disruption compared to other methods.

The results and guidance for using this equipment are documented in a new Corps of Engineers Public Works Technical Bulletin, PWTB 200-1-92, *Guidance and Demonstration of Motion Detection Systems for Monitoring of Species of Concern*. The PWTB can be downloaded at: http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215.

To effectively recover and manage species of concern on Department of Defense lands, natural resource managers need tools that accurately and effectively



The camera is aimed at the bait in the camera trap station.

survey and monitor species. Current survey methods, such as live-trapping, provide good information on Mohave ground squirrel presence, distribution and density. However, cost, logistical issues such as permit requirements and availability of permitted personnel can be prohibitive and may hinder collection of this information.

With the Mohave ground squirrel currently listed as a Priority 1 Species-At-Risk candidate within the Army and as a candidate for federal listing, it is especially important to collect current population and distribution information. A species' listing on military lands can potentially compromise the training or testing mission.

ERDC's Construction Engineering Research Laboratory devised a test at Fort Irwin's National Training Center in which the region's primary three ground squirrel species were lured to motion detection cameras with bait. The cameras had low energy requirements and minimized data processing by only triggering in the presence of animal movement.

Data collected at these camera trap stations showed clear differentiation between ground squirrel species and provided useful information on their behavior patterns. Drawbacks included

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

the inability to do valid species counts without some type of live trapping and tagging prior to installing the cameras.

The PWTB contains a complete list of pros and cons and also offers tips for setting up and using the motion detector cameras. The equipment could be used to monitor numerous other species as part of natural resources management programs.

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A Mohave ground squirrel enters detection range after finding the bait at a camera trap station. Photos courtesy of ERDC

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Plan. The toolbox provides information to help evaluate and select appropriate water conservation technologies ranging from plumbing fixtures to water reuse and low impact development.

Commonly called the "Water Management Toolbox," this site provides references, information and links related to all aspects of installation water programs.


This information is invaluable to both new staff and experienced water managers who are seeking the latest information.

The Water Management Toolbox is accessible to anyone seeking to learn more about water management. The toolbox is available at <http://water-management-toolbox.com>.

The Water Management Toolbox is documented in PWTB 200-1-94, *Army*

Water Conservation Collaboration Web Portal, available at http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215.

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Career development: Breaking your own glass ceiling, part 2

by Jim Hearn

As I discussed in the May/June issue, knowing your proclivity for group or solitary activity, concrete or ephemeral thinking and other personal strengths, allows you to identify those positions that would advance your career and take advantage of your strong interest areas. “Knowing thyself” is the foundation for the journey through career exploration.

The next step in the journey is to conduct an honest and truthful personal SWOT analysis. For those not familiar with this acronym, it stands for strengths, weaknesses, opportunities and threats. SWOT is typically used in organizational strategic planning, but it also works well on the personal level.

The key here is an honest and truthful assessment. Some people are overly critical of themselves, and others like to see themselves always in a positive light. If you are not honest, you may miss deficiencies that are holding you back or not take advantage of special skills that make you more marketable.

You can always reinvent yourself; I have many times. It requires honest SWOT analysis and work to eliminate the gaps.

On what do you apply this SWOT analysis? If your career field has a prescribed path, that will give you an idea of what is required in breadth and depth along that path. Some areas of particular importance are:

- education,
- training,
- mobility and adaptability,
- job performance, and
- networks and contacts.

Your SWOT analysis should be applied to the above focus areas and any other that you add to the mix. Carefully examine your goal position for what requirements fall under areas that you can control.

While looking at your strengths and weaknesses, think about how they compare to your similarly situated colleagues. They



Jim Hearn
Photo by Harry Weddington,
Omaha District

will be your competition.

Strengths – These are areas to emphasize in your resumes and job inquiries.

If you already have a master’s degree and have published professional articles, then stress these accomplishments, especially if this is a technical position. If you have successfully supervised large teams over expanded distances, this shows your great leadership.

Line up your strengths and develop a story board to tell of your accomplishments.

Weaknesses – This is the most troubling area to examine, but the one that will give you the greatest insight on improving future opportunities. For instance, if you have not taken the Civilian Education System Intermediate Course, you cannot apply for funded long-term training.

Working at many organizational levels and working for different agencies are desirable characteristics for senior leaders. Have you done that?

If you want to be a senior executive, you should attend one of the Senior Service Schools.

Are you well known in your organization? It is said that 70 percent of career advancement is through contacts or networks. Through developmental assignments, task forces, project delivery teams or other collaborative problem-

solving efforts involving outside teammates, you should develop a wide following of people who praise your skills, teamwork and professionalism. This is especially true if they are saying those words of acclaim to a potential employer.

As Jim Collins indicates in “Good to Great,” you have to confront the brutal facts in order to advance to greatness. This gap analysis between your goal requirements and your weaknesses will be an important component of your plan to plug these gaps and engage your full potential.

Opportunities – Are there areas that are growing in the current job environment? For example, sustainable facilities and energy efficiencies are important focus areas for the Army and the Department of Defense.

Many government employees are retirement eligible. An improving economy, stock market successes or changes to the retirement system could send many of these eligible employees to their Human Resources Offices.

Are you ready and do you have the knowledge, skills, abilities and credentials to move to a vacated position of greater responsibility?

Threats – Do you see something in the future that will put your advancement opportunities in jeopardy?

If you are involved with Base Realignment and Closure, will your installation close or downsize? Can you move?

The economic environment seems to indicate reduced budgets for the foreseeable future. Will you be affected?

This analysis should give you a good idea about which jobs not to pursue if the job or the organization is unstable.

In summary, the introspection that you applied to your personality and priorities must now be applied to your strengths and weaknesses. Your plan will



Army Competency Management System survey on the horizon

by Kamilah Covington

You may be one of the employees the Army will ask to help determine the direction of workforce planning. The 2011 Army Competency Management System, in which selected employees will be tasked to participate, will assess competencies needed for their positions.

The CMS is designed to validate competency requirements for each position, identify proficiency levels of employees in the required competencies, conduct gap analyses and accommodate updates and re-evaluations.

The U.S. Army Corps of Engineers has supported the Army as it implemented competency management since 2007. The CMS provided data that the Corps used to develop professional development maps, reports that go to Congress and input for the Army's Human Capital Plan and the Corps' Human Capital Plan.

Competencies are an observable, measurable set of skills, knowledge, abilities, behaviors and other characteristics an individual needs to successfully perform work roles or occupational functions. They are typically required at different levels of proficiency depending on the specific work role or occupational function, and they can help ensure individual and team performance aligns with the organization's mission and strategic direction.

The National Defense Authorization Acts for fiscal years 2006 and 2010 and the *Fiscal Year 2006 Quadrennial Defense Review* all mandated that the Department

of Defense and its components assess existing and future competencies needed within the Civilian workforce and identify and address any competency gaps that may exist.

To meet these requirements, the Headquarters, Department of the Army, Office of the Assistant G-1 for Civilian Personnel launched the CMS in 2007 for Army supervisors and employees on a pilot basis and then again in 2008 and 2009 for selected critical occupations. Based on the experience gained from these initial CMS assessment efforts, HQDA revised and updated the CMS processes to reflect lessons learned.

The Office of the Secretary of Defense has accelerated its efforts to comply with the requirements for competency-based workforce planning and management, to address concerns in a recent Government Accountability Office report and to meet the requirements to periodically report on its progress to Congress. The CMS will capture both competency proficiency level requirements of Army positions and competency proficiency levels of the existing Civilian workforce — essential first steps toward competency-based workforce planning.

To achieve success, it is vital that the Army capture and validate competency requirements for its mission critical occupations in the 2011 assessment.

Employees in mission critical occupations will be tasked by their Functional Proponency Office to identify

Acronyms and Abbreviations

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| CMS | Competency Management System |
| HQDA | Headquarters, Department of the Army |



competencies required for their positions in an electronic survey. Supervisors will be required to validate their employees' assessments.


Once the validations are completed, the Army CMS will be used to identify competency gaps, develop strategies to close the gaps and identify resources needed to implement gap closure strategies.

HQDA and the Corps hope to establish:

- common competency taxonomies where applicable;
- job analysis methodologies used for selection, promotion, training and compensation programs;
- strategies for workforce planning, competency-based career management and succession planning;
- assessment methodology for tracking and closing competency gaps;
- workforce planning and competency management tools; and
- strategies for meeting reporting requirements.

For more information on the Army CMS, visit <https://cms.cpol.army.mil>.

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involve emphasizing your strengths and minimizing or eliminating your weak areas.

The higher up that you go, the greater the competition. When a manager has evaluated 100 resumes for a position and sifted down to the top five, I can guarantee those five resumes look

absolutely stellar.

Evaluation teams look for any gap that will eliminate a candidate. You need to plug all your gaps to ensure you are in the top five.

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



Army Civilian Education System 101

by Kamilah Covington

The Army Civilian Education System is a progressive and sequential leader development program that provides enhanced educational opportunities for Army Civilians throughout their careers. CES provides a series of courses through blended learning, distributed learning and resident training.

Each course is described in the sequence in which it should be attended.

Foundation Course – is available to all Army Civilians as self-development via distributed learning and is required for all new Department of the Army interns, team leaders, supervisors and managers hired after Sept. 30, 2006.

Action Officer Development Course – is available to all Army Civilians as self-development via distributed learning and is required for all interns before completing the intern program.

Supervisor Development Course – is available to all Army Civilians as self-development via distributed learning and is a required course for supervisors and managers of Army Civilians.

Basic Course – is offered as distributed learning and resident training, which are both required for team leaders, supervisors

and managers. The distributed learning training is also available to Army Civilians as self-development, and the resident training can be attended on a space-available basis.

Intermediate Course – is offered as distributed learning and resident training, which are both required for supervisors and managers. The distributed learning training is also available to all Army Civilians as self-development, and the resident training can be attended on a space-available basis.

Manager Development Course – is available to all Army employees as self-development via distributed learning and is recommended for all Army Civilians in supervisory or managerial positions before attending the Advanced Course.

Advanced Course – is offered as distributed learning and resident training, which are both required for supervisors and managers at the GS-13 to GS-15 levels or equivalent pay band. The distributed learning training is available to all Army Civilians as self-development, and the resident training can be attended on a space-available basis.

Continuing Education for Senior Leaders – provides a participatory

environment in which senior leaders discuss current issues and challenges facing Civilian and military leaders. It also provides a continuing education program on specific topics. This course is for senior Civilian leaders at the GS-14 or 15 levels or equivalent pay band and is

Acronyms and Abbreviations

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| CES | Civilian Education System |
| SSC | Senior Service College |

a combination of 40 hours of distributed learning and one week of resident instruction.

Senior Service College – provides advanced level educational opportunities for leaders who require an understanding of complex policy and operational challenges, and increased knowledge of the national security mission. The resident SSC is a 10-month program, and the nonresident SSC is a 24-month program. Selection is competitive, and selections are made by a Headquarters, Department of the Army, secretariat board. Army Civilians at the GS-14 or 15 levels or equivalent pay band are eligible.

Tuition for most permanent Army Civilians is centrally funded; the Army pays for tuition, travel and per diem. Employee salaries are not funded, however. Each organization must budget accordingly to ensure the Army develops its future leaders.

For more information on the Army CES, visit the Army Management Staff College's web site, <http://www.amsc.belvoir.army.mil/academic/ces/>, and view the Army Civilian Training Education and Development System Training Catalog, <http://cpol.army.mil/library/train/catalog/ch01intro.html>. The catalog is also the source for information on SSC nomination procedures.

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Basic Course students work on a class exercise. Photo courtesy of Army Management Staff College



Michels is team lead for work management at Public Works Division

by Mary Beth Thompson

A twist of fate engaged Jeff Michels in installation management. Michels is not an engineer. His bachelor's degree is in liberal studies, and his master's is in business administration. He retired from the Army as a command sergeant major after a long career as an intelligence specialist. Yet, you could say that the Army is responsible for his career switch.

While on active duty, the Army assigned Michels to be the noncommissioned officer in charge at Mount Meissner, Germany, a remote installation near the then inner-German border. His responsibilities were similar to that of an installation command sergeant major, and he soon found himself intimately involved in the installation's Public Works. He quickly learned how to influence the processes and decisions to improve living and working conditions on the installation. Michels saw the difference he could make in the lives of Soldiers and Family members, a turning point for him.

After his retirement from active duty in 2004, Michels took the position of Residential Communities Initiative liaison for the Installation Management Command's Northwest Region, assisting installations with transition from Army ownership to that of the private developer. When the Northwest and Southwest regions were combined, he became the Housing Branch chief of the West Region. When IMCOM Headquarters stood up in San Antonio, Michels moved there to be unaccompanied personnel housing team lead in the Housing Branch of the Public Works Division.

Last October, Michels transferred to the Business Operations Branch as the work management team lead. His team is responsible for allocating and programming funds for utilities, wastewater management, refuse collection and engineering services — everything that Directorates of Public Works provide on installations.

The team is also responsible for DPW work processes. Team members ensure



Jeff Michels
Courtesy photo

that the right reporting mechanisms and tools are in place, so leadership has the information it needs to make resource-informed decisions. One of the major programs the team manages is the Army Centralized Furnishings Program, working with the Engineering and Support Center, Huntsville, Ala., to oversee furnishings delivery for Military Construction projects.

Another responsibility — one that is near to the hearts of DPWs — is manpower. Michels and his team are advocates at the IMCOM Headquarters level for Public Works manpower issues.

"About the biggest thing we're doing right now," he said, "is building the TDAs [tables of distribution and allowances] and the concept plan to document the IMCOM Headquarters requirements. This effort has not been done since IMCOM stood up as IMA [Installation Management Agency] in 2002. So, we're trying to document what our true requirements are as far as manpower and workload."

The dynamic nature of IMCOM further complicates matters with ongoing decisions changing the basic assumptions driving the organization's end-state, Michels said. Manpower issues are not the only ones that experience modifications. Keeping pace with the many adjustments created by changing priorities, acts of nature or funding levels is challenging. He likened the complex task to building an aircraft

Acronyms and Abbreviations

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| DPW | Directorate of Public Works |
| IMCOM | Installation Management Command |

when the plane is already in the air.

The challenges come with lots of rewards as well.

"I enjoy the interaction with the regions and the garrisons to work through processes to try to develop more effective and efficient ways of delivering our business," he said.

IMCOM was born as a dynamic organization and continues to be one today, Michels said. Despite the challenge, he stays focused on what he considers the right goal — providing quality service to Soldiers, Civilians and Families. He brings his philosophy of "never stop learning" to the job.

"There's always a better way to do what you're doing," Michels said. "Look at it from a different perspective; take a step back and look at it. You can do it more efficiently or effectively."

As evidence of Michels' lifelong learning, in addition to his college degrees, he has logged numerous hours in courses of study. He recently completed the Army's Cost Management Certification Course. He is also a Lean Six Sigma Black Belt and a graduate of the U.S. Army Sergeants Major Academy.

When asked what drives him, he recounted a story from his first duty assignment at Fort Bragg, N.C. He passed a billboard everyday on his commute that pictured a Soldier with the caption "What have you done for a Soldier today?" That sentiment served then, and it continues today, as a reminder that reinforces his purpose — to help Soldiers and their Families.

Michels did not arrive in a Public Works career by the usual path. He combined his interests in business management and the welfare of Soldiers and their Families, augmented those interests with a



Winkler chosen as Installation Support Professional of the Year

by Scott Farrow

An employee of the Engineering and Support Center, Huntsville, Ala., was named the U.S. Army Corps of Engineers' 2011 Installation Support Professional of the Year. Jonathan Winkler, a program manager with the Installation Planning and Programming Center of Standardization, is the fifth Huntsville Center employee to be given the award since it was established six years ago.

The USACE director of Military Programs established the award to recognize a USACE employee who has contributed to the success of operations at the installation level. The award is designed to recognize an individual who demonstrates excellence and leads or performs work that is recognized as important to successful Army Directorate of Public Works operations at garrison, region or headquarters levels.

"Winkler is being honored with this award because of his work and leadership in many installation support services that have benefitted the Army by improving the working and living conditions for



Jonathan Winkler
Photo by Scott Farrow

Soldiers, their Families and Civilians," said Huntsville Center's commander Col. Nello Tortora. "Through his hard work, Winkler has improved the Installation Support Services Program."

Some of the services Winkler works on include child development centers, physical fitness facilities, youth activity centers and Soldier Family support centers.

Winkler said Huntsville Center's

Acronyms and Abbreviations

| | |
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| ISS | Installation Support Services |
| USACE | U.S. Army Corps of Engineers |

Installation Support Services benefit the Army by helping to provide the best possible mission and quality of life support to military installations.

"My team's work on ISS projects has benefited the Army primarily through support to the Military Construction program, but ISS also benefits Army Families primarily through our ties to the Center of Standardization facility types for which we are responsible, which include child development centers, youth activity centers and physical fitness facilities," he said.

The Installation Support Professional of the Year award will be presented during the USACE Summer Leader Conference in New Orleans Aug. 1.

Scott Farrow is a public affairs specialist, Huntsville Center.

Army's longtime water and waste expert retires

by David Purcell

William Eng retired in June after serving the federal government, the Army and the nation for more than 43 years. Eng was the program manager for Water, Solid Waste and Recycling in the Facilities Policy Division of the Office of the Assistant Chief of Staff for Installation Management.

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commitment to lifelong learning, and turned them into a career within the installation management community.

Mary Beth Thompson is the managing editor, Public Works Digest.

Since January 1994, he served on the Army staff, first in the Office of the Assistant Chief of Engineers and then joining OACSIM when it was established. Eng was the sole subject matter expert at the Department of Army level for potable water utility systems, wastewater systems, Army landfills, nonhazardous waste recycling and qualified recycling centers.

While on the Army staff, Eng was responsible for the closing of most of the Army's landfills by establishing a program to increase the recycling of nonhazardous materials by 40 percent, diverting it from

Army landfills. He virtually stood up and was the champion of installation



Bill Eng (left) accepts a National Bill Eng Week Proclamation, a gag gift, from Bob Sperberg, chief, Facilities Policy Division, OACSIM, at Eng's retirement luncheon. Photo by Vince Eng

Acronyms and Abbreviations

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|--------|--|
| OACSIM | Office of the Assistant Chief of Staff for Installation Management |
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Ford is Huntsville's deputy for programs and technical management

by Debra Valine

Charles M. Ford became the deputy for programs and technical management at the U.S. Army Engineering and Support Center, Huntsville, Ala., Jan. 2, upon the retirement of the former director, John Matthews.

Matthews retired following a more than 40-year career with the U.S. Army Corps of Engineers.

Prior to becoming the director for programs and technical management, Ford served in various positions during his 15 years at the Huntsville Center, including as the director of installation support and programs management and as the director of chemical demilitarization.

Ford also brings many years of field construction experience overseas as well as program and project management to the job.

"When I was in construction, I was on an installation working directly with the garrison commanders and directors of Public Works," Ford said. "I understand some of the issues that come up when programming and budgeting for projects. I am also familiar with issues that come up when operating facilities on the garrisons."

Ford's other USACE assignments include 10 years in Incirlik, Turkey, where



Charles M. Ford
Courtesy photo

he held successive positions as chief of the Contract Administration Branch, project engineer, resident engineer and area engineer. As the area engineer, he was responsible for managing all USACE construction efforts in Turkey, Northern Italy, Northern Iraq and Cyprus. He also served a tour in Germany as the Corps' project manager for all medical clinics within Europe.

He returned with his family to Alabama in 1996 to work at the Huntsville Center as a project manager in the Medical Facility Repair and Renewal Program.

Throughout his career, Ford has been assigned special projects including those in

Acronyms and Abbreviations

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| USACE | U.S. Army Corps of Engineers |
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Krakow, Poland; Khelmenski, Ukraine; and Shchuch'ye, Russia. He also served in the U.S. Army as a captain from 1978 to 1983.

"One of the things I want to do is have Huntsville Center recognized as a tool in the Installation Management Command's toolbox," Ford said. "Huntsville Center project managers work with Corps of Engineers' districts to provide facility-level solutions.

"I also want to partner with Headquarters, U.S. Army Corps of Engineers, to develop solutions at the programmatic enterprise level. Huntsville Center has a wealth of experience and diverse program areas that can be leveraged at both levels."

Ford attended Auburn University in Auburn, Ala., where he received his master's degree in civil engineering, geotechnical, in 1978 and a bachelor's degree in civil engineering in 1976. He is a professional engineer, project management professional and Defense Acquisition Corps member.

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

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qualified recycling centers, which have both reduced the flow of reusable waste to landfills and provided funds to installation Morale, Welfare and Recreation accounts that have, in turn, enhanced Soldier quality of life. In addition, in fiscal 2010, his efforts resulted in a 15 percent reduction in water consumption compared to the fiscal 2003 baseline.

During his long career, Eng spent almost 14 years with the U.S. Army Corps of Engineers as a civil engineer in

the North Atlantic Division and later in Saudi Arabia with the Al Batin District. He also served with both Army Engineer Command, Europe, and in the Facilities Engineer offices in Karlsruhe, Germany, and he was a program analyst and evaluation engineer in the Engineering and Housing Support Center at Fort Belvoir, Va.

"All but one of the 43 years of my federal service has been with the Army," Eng said. "Although I was not in the Army, the Army is very much part of me, and I am grateful for the opportunity to

make a contribution to improving the management of our installations."

Eng will take his experience and skills in recycling into retirement and launch a career in the recycling of homes as a real estate agent.

"Anyone want to buy a house?" he quipped.

David Purcell is the chief, Army Energy and Utility Branch, Facilities Policy Division, OACSIM.

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