Public Works DIGEST

Volume XX, No.6,
November/December 2008

This Issue:
Annual Report Summaries

IMCOM

U.S. ARMY INSTALLATION MANAGEMENT COMMAND

Composite patches at West Point's stadium are scanned using nondestructive acoustic wave guide sensors as part of a corrosion retrofit test project. Photo courtesy of Construction Engineer Research Laboratory, U.S. Army Engineer Research and Development Center. Page 18

Public Works DIGEST

Volume XX, No.6,
November/December 2008

U.S. Army Installation
Management Command
2511 Jefferson Davis Highway
Arlington, Virginia 22202-3926

Public Works Digest is an unofficial publication of the U.S. Army Installation Management Command, under AR 360-1, The Army Public Affairs Program. Method of reproduction: photo-offset; press run: 1,600; estimated readership: 40,000. Editorial views and opinions expressed are not necessarily those of the Department of the Army. Mention of specific vendors does not constitute endorsement by the Department of the Army or any element thereof.

Address mail to:
U.S. Army Installation Management Command
Attn: Editor, *Public Works Digest*
2511 Jefferson Davis Highway
Arlington, VA 22202-3926
Telephone: 202-761-0022 DSN 763
FAX: 202-761-4169
e-mail:
mary.b.thompson@usace.army.mil

Donald G. LaRocque
Public Works Program Manager,
Installation Management Command

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

Layout:
Corporate Visions, Inc.
Washington, DC

Printed on recycled paper.

Public Works keeps pace with increasing Army needs in 2008

by Lt. Gen. Robert Wilson

2008 has truly been an eventful and unprecedented year. Army growth continued to intensify in concert with leadership expectations. Our growing inventory must support the Army Transformation, Base Realignment and Closure, and Global Rebasing. There were some setbacks, notably in barracks, but overall, progress has been steady, measurable and sure. Thank you all up front for the great work the Public Works community is doing for our Soldiers and Families.

Army Growth continues to intensify in concert with leadership expectations. The condition of our existing enduring inventory — thanks to significant congressional support and help — is steadily improving, and our excess, unsustainable inventory continues to decrease.

The barracks program was tremendously energized after a video depicting poor conditions in our permanent party barracks at Fort Bragg, N.C., appeared on YouTube drawing media attention. Barracks quickly became a leadership pacing item.

Mold, moisture and vapor issues were brought to light. More than $900 million of Repair and Maintenance resourcing was directed into barracks remedial contracts. A multi-year barracks restoration program was developed and launched. The first massive contracts were awarded at Fort Polk, La, and Fort Gordon, Ga., for $183 million and $40 million respectively. Public Works also authored a comprehensive mold, moisture and vapor-control Netcall that is a milestone engineer guide for restoration of enduring legacy facilities.

The Installation Management Command First Sergeant's Barracks Initiative, the critical program to sustain Army noncommissioned officer leadership in barracks operations, was developed, resourced and launched at nine installations. The Trainee Barracks Upgrade Program was accelerated by $45 million with additional funding provided at Fort Jackson, S.C., to award the first "Starship" renovation project.

Acronyms and Abbreviations	
FY	fiscal year
IMCOM	Installation Management Command

Lt. Gen. Robert Wilson
Photo by Monica King

The Energy and Utility program was singularly successful. Our garrisons have, since 2003, continually exceeded the statutory, presidential, Department of Defense and Army goals for energy reduction. These achievements have resulted in a direct cost avoidance of more than $50 million annually.

We developed Army Energy Conservation Investment Program projects and secured more than $20 million for them. We developed and secured funding for $130 million of third-party-financed energy projects and launched several new programs this past year, including the Renewable Energy, Metering and the Energy Master Plan programs.

The Army continues to be the leader and trend setter in all these areas. We managed to success more than $300 million of capital improvements to privatized systems.

Energy training has also done quite well. We have trained and certified 42 new IMCOM certified energy managers and sponsored, organized and executed three IMCOM Energy Summits.

Our Transportation Infrastructure program matured tremendously this year. We successfully inspected 12 airfields, 690 bridges and 77 dams. To execute the most needed repairs to these critical facilities, $88 million was secured, and contracts were developed and awarded. This program was also expanded in FY 2008 to include port facilities.

The Master Planning and Military Construction programs also made tremendous progress with the successful award of the first $2 billion round of Grow-the-Army projects and completion of master plans at 30 major installations. Area development plans were created for the 35 installations with Warrior-in-Transition campuses, and the $1.3 billion Army Medical Action Plan program was successfully defended to Army leadership and Congress.

The Real Property and Real Estate programs matured with the development of a comprehensive and detailed relocatable building database that accounts for the 9,000-plus relocatable buildings in our inventory and their exit plans. This database is the essential data used for congressional and Government Accountability Office reports.

The visibility of barracks issues also resulted in several system changes to the Installation Status Report (Quality of Life Amber reporting) and the Real Property Inventory to allow more accurate accounting of facility conditions and configurations.

The Initial-issue and Replacement Furniture programs kicked into high gear in FY 2008. More than $80 million of furniture was prioritized and acquired to ensure that all new facilities receive new, quality furniture on time for beneficial occupancy.

Demolitions also continued apace with more than 1.5 million square feet demolished for an average of $8 per square foot. A $40 million special demolition program was also initiated to address a large inventory of abandoned and contaminated facilities at Aberdeen Proving Ground, Md.

Public Works also led IMCOM with the most Common Levels of Support services/Service Support Packages and Business Process Redesign initiatives ➤

Corps' Military Program is BUILDING STRONG

by Lt. Gen. Robert L. Van Antwerp

The U.S. Army Corps of Engineers' new slogan, BUILDING STRONG℠, is at the heart of the work accomplished by our Military Programs Directorate. With a mission of unprecedented scope, we are building strong warfighters, strong military Families and strong partnerships.

Our nation continues to face many challenges, and much of the burden is being borne by our volunteer force. Our military construction program directly affects them, because we are truly building the foundation for our Army. Whether in the form of combat training centers, new barracks or brigade headquarters, we are providing the facilities necessary for building strong warfighters.

Lt. Gen. Robert L. Van Antwerp
Photo by F.T. Eyre

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
DoD	Department of Defense
FY	fiscal year
GWOT	Global War on Terror
LEED	Leadership in Energy and Environmental Design
MILCON	Military Construction
USACE	U.S. Army Corps of Engineers

The spouses who support our warfighters also face challenges in the cause of protecting our nation, for they are charged with keeping Families on track while loved ones are deployed. Child development centers, chapels and fitness centers are just some of the quality-of-life facilities we are building at installations around the world to ensure military Families remain strong.

Although we are in the midst of the largest construction boom since World War II, it is through the operations and maintenance projects that occur year in and year out that we build our strong partnerships with the Directorates of Public Works and base engineers. These partnerships are important as we face the challenges posed by the 2005 Base Realignment and Closure, the Modular Force initiative and our continued support to the Global War on Terror.

The Corps team, our customers and ➤

(continued from previous page)

resulting in the most effective and efficient use of available resources.

We also worked closely with the Facility Sustainment Model proponents and were successful in correcting: erroneous area cost factors, restoring more than $200 million in Sustainment funding; inadequate cost factors for unpaved roads, resulting in an additional $70 million in Sustainment funding; and mischaracterization of privatized utilities, preventing a $30 million loss of Sustainment funding.

New Army missions, like Access Control Points and Training Resource Arbitration Panel, continue to drive requirements for relocatable buildings. We secured approvals for 28 garrisons for more than $250 million of new-mission, one-time, facility project requirements. We made the stand-up of U.S. Africa Command at Stuttgart, Germany, a success by timely execution of $60 million of new-mission projects.

The Restoration and Modernization program began in earnest in FY 2008. We executed the Barracks Repair and Maintenance program totaling more than $500 million, a leadership high-visibility program for more than $275 million and other renovation projects totaling $300 million.

The two most notable accomplishments were: approval and award of a $140 million renovation contract for Infantry Hall at Fort Benning, Ga., the single largest one-building renovation project in Army history; and approval and award of a $184 million barracks energy system renovation contract at Fort Polk, the single largest Sustainment, Restoration and Modernization contract in IMCOM history.

We also secured, on behalf of Army Materiel Command, approvals for $21 million for laboratory revitalization projects.

FY 2009 promises to be another banner year. In addition to the president's request for our programs, Congress has appropriated an additional $493 million to be invested in improving our existing barracks conditions and accelerating barracks replacement construction. Mold, moisture and vapor-control projects will have priority to ensure our enduring inventory actually endures.

The Military Construction program will peak in FY 2009. Master Plans will be made current and support Army Rebalance and Rest. Housing for our Soldiers and Families will improve. Reduction of energy use and investment in alternative energy sources will remain center stage. Improvement to our transportation infrastructure will make headway. Accurate accounting of our inventory must improve.

As always, you will excel in all these areas. Please know that your service to the nation, to the Army and to its Soldiers and Families is appreciated.

Lt. Gen. Robert Wilson is the assistant chief of staff for installation management and commander, Installation Management Command.

(continued from previous page)

our contractors refused to let the demands of fiscal year 2008's challenging operational tempo stand in the way of success. We awarded 92 percent of our planned programs for Army and other Department of Defense customers for a total of 415 Military Construction and BRAC projects with a program amount of $11.92 billion. (*Editor's note: See "MILCON awarded in FY 2008" box for details.)*

The current fiscal year is providing an even larger military mission. FY 2009 will see the peak of our construction surge with nearly $14 billion programmed for execution.

MILCON Transformation continues to yield tremendous benefits. The standard designs USACE is developing for 43 Army facility types are fundamental to MILCON Transformation success. The standard design templates for facilities such as barracks, fire stations and dining facilities allow for more consistent budgeting, which saves military installations time and money.

To develop and oversee standard designs, USACE delegated management to eight Centers of Standardization, each of which takes responsibility for certain standard product lines. As a result, contractors can focus on construction rather than design.

The centers also are advertising and awarding the standard facility projects using regional contracts, allowing contractors to become consistent in their pricing and the quality of their work. The strong partnership we've built with the industry is helping us to safely deliver quality facilities within the budgets we have been given to meet Army operational timelines.

The Corps also executed about $3.6 billion in operations and maintenance requirements and more than $9 million in Installations Support funds in direct support of Army installations and other Installation Management Command customers, and provided $415 million in real estate support through our Real Estate Community of Practice.

I am encouraged by our progress in energy conservation and environmental stewardship. In FY 2008, new Department of Defense climate-controlled construction was certifiable under the U.S. Green Building Council's Leadership in Energy and Environmental Design Silver rating. By using LEED's nationally accepted whole-building approach to sustainable, green design, we are improving energy efficiency, reducing life-cycle costs and reducing environmental impacts.

In FY 2008, the Corps accomplished nearly $1 billion in reimbursable environmental requirements, including $253 million for Environmental Quality work of which $177 million was in support of the Army garrisons. We also awarded $287 million of work in the Formerly Used Defense Sites Program. We are indeed building a strong, sustainable environment for our next generation.

Support to the GWOT effort continues to be our top priority. To date, that support has encompassed about 7,000 projects in Iraq and Afghanistan worth more than $16.7 billion. *(Editor's note: See "All Awards in Iraq and Afghanistan" box for details.)* I am very proud of all our many Corps employees who have voluntarily served in support of the GWOT.

MILCON awarded in FY 2008

Type	Projects	Amount
Army MILCON	181	$4.6 billion
Army BRAC	62	$2.8 billion
Army awarded total	243	$7.4 billion
Air Force	71	$1.3 billion
Air Force BRAC	48	$854 million
DoD BRAC	10	$1.5 billion
Other DoD customers	43	$851 million
Other awarded total	172	$4.5 billion
Awarded grand total	415	$11.9 billion

Clearly, our mission is far from complete but I am confident our energetic team is ready to meet the challenges of FY 2009. This year we'll move toward an adapt-build approach to construction, with our centers adapting standard designs for a specific location. We'll continue to embrace technology like Building Information Modeling tools for planning, design, construction and life-cycle building management. And we'll get closer to our goal of recycling 90 percent of building materials.

I am reminded by my team every day that working on a military installation is like no other job site. We see first-hand the strong military communities built and sustained by your professionalism and dedication. And we'll continue to help you ensure the quality of life of our Soldiers and their Families is commensurate with the incredible sacrifice they are making on behalf of our nation.

Essayons.

Lt. Gen. Robert L. Van Antwerp is the chief of engineers and the commanding general of the U.S. Army Corps of Engineers.

All Awards in Iraq, Afghanistan

Location	Total to date, including FY 2008	FY 2008	FY 2009
Iraq	$12.4 billion	$1.9 billion	$2.0 billion
Afghanistan	$4.3 billion	$1.4 billion	$2.1 billion

Toward a secure future for Soldiers and Families

by Col. Maria R. Gervais

The U.S. Army is in the midst of its greatest change since World War II. The changes of Army Transformation, Base Realignment and Closure, the restationing of formerly overseas units and the growth of the Army will impact 380,000 Soldiers and Family members at 304 installations and locations.

But the people in the Army's environmental programs are working to ensure the sustainability and good environmental condition of the installations are maintained and improved throughout the transformation process. Throughout 2008, the U.S. Army Environmental Command, a key component of an environmental program stretching from the Pentagon to the neighborhood, worked diligently to ensure the environmental safety and sustainability of the Army's home.

USAEC's role is to lead and execute environmental programs across the Army and provide environmental expertise to enable training, operations, acquisition and sustainable military communities. Simply put, our vision is to be the Army's "unit on point" for environmental programs.

In October 2006, USAEC, formerly an Army field operating agency, became a major subordinate command under the Installation Management Command. In July, I became the 16th commander of this 37-year-old Army institution. This command offers a great opportunity and I feel that I have the best of both worlds — I get to command an organization whose purpose is to facilitate Soldier and mission readiness while simultaneously protecting the environment, not just for today but also for the future.

USAEC faces several challenges in both the near and long term. We will be called upon to execute a BRAC 2005-directed relocation to Fort Sam Houston, Texas, no later than 2011 while continuing to support the Army's environmental mission. During this period, the organization will transform into a leaner, more efficient organization in order to properly meet emerging challenges; will rebuild its workforce in San Antonio and facilitate Soldier and mission readiness.

Although transforming and transitioning the organization, USAEC will continue to support Army installations with a full suite of products and services. Most visibly, the command has been working to transform the way the Army does its environmental business in order to achieve better cost savings and more efficiency improvements.

Environmental liaisons work with training officials on the layout of a new range required by the growth of Fort Bliss, Texas. Photo by Neal Snyder.

Strategic sourcing

Installations will soon be able to acquire environmental services more effectively and efficiently by tapping the vast buying power of IMCOM through strategic sourcing of contracted services.

USAEC, in cooperation with the Army Mission and Installation Contracting Command, is developing four indefinite-delivery, indefinite-quantity contract suites with five-year ordering periods for environmental services.

The contracts will support installation requirements for cultural resources management, natural resources management, environmental compliance and management, and professional services for installations across the Army. Once awarded, the base contracts will help installations maximize buying power through task order competition among best in class vendors, fulfilling the IMCOM promise of accomplishing more with the same amount of funding.

We also foresee more than $25 million in financial benefits from Lean Six Sigma projects undertaken in 2008. From more than $5 million saved in Operational Range Assessment Program efficiencies to finding programmatic National Environmental Policy Act solutions for fielding the M1117 Armored Security Vehicle and Battlefield Effects Simulator systems, Lean Six Sigma has solidly demonstrated its value as a method of examining and improving business processes within the Army's environmental programs.

Strategic sourcing is the leading edge of a full transformation of Army environmental quality programs. IMCOM is putting its scope of resources into helping the Army invest in the future, establishing long-term sustainability goals and integrating the management of its air, water and land programs innovatively.

Army Compatible Use Buffers

Environmental quality transformation also relies on finding appropriate partners to reach our goals. The ACUB program now counts more than 30 partners in local and national conservation groups, state and county governments, and other federal agencies.

As of September, our partners have provided more than $154 million toward the preservation of more than 95,000 acres around Army installations through voluntary sales of conservation easements and land. ACUB preserves our installations' ability to conduct training and testing operations by protecting them from the effects of encroaching development.

NEPA

As the Army continues with its fast-paced organizational transformation, USAEC continues to play a pivotal role supporting growth and realignment decisions. USAEC formulated NEPA analyses to support decisions for realigning the ➤

(continued from previous page)

Army's force structure and growing the Army by 74,200 Soldiers in accordance with the 2007 presidential Grow-the-Army initiative.

By addressing NEPA requirements programmatically, USAEC supported the senior Army leadership by identifying stationing constraints and establishing a foundation for installations impacted by Army transformation to conduct their own specific analyses. In fiscal 2008, USAEC facilitated NEPA analysis and compliance for five installations affected by Army growth.

To reduce the installation workload, USAEC developed a contract mechanism for installations to use in competitively contracting environmental impact statements and environmental assessments. Staff from MICC, working with USAEC, negotiated these performance-based contracts with three companies for firm fixed-price development of NEPA products. The three firms compete for each task order placed by an installation to improve service and reduce costs.

USAEC's use of a competitive contract and streamlined approach to NEPA results in a more streamlined and efficient NEPA staffing and execution process. This has improved the ability of Army facilities and operational planners to synchronize their plans and support the mission while reducing environmental compliance costs.

Cleanup and munitions response

Leaving the past behind is a process, as well. USAEC's execution of the centralized program management of the Army's Installation Restoration Program has resulted in the completed cleanup (remedy-in-place or response complete) of 132 sites and 13 installations in fiscal 2008.

As IRP moves toward completion, Army cleanup efforts are switching their focus to unexploded ordnance, discarded military munitions and munitions constituents on inactive ranges. The Military Munitions Response Program completed site inspections at 50 installations in fiscal 2008, for a total of 79 completed so far. The remaining 67 are due for completion in the next two years.

USAEC spent $33 million — about 7.6 percent of our cleanup budget — on MMRP in fiscal 2008. In fiscal 2009, that will increase to up to $60 million. Completed MMRP site inspections have resulted in a 62 percent reduction in the number of acres requiring further actions, thereby reducing the overall projected cost for this program.

Fiscal 2009 will mark the beginning of remedial inspection and feasibility studies in earnest. Using performance-based acquisition contracts in the IRP has resulted in a $315 million cost savings from fiscal years 2002 to 2007. This cost savings has been reinvested into the IRP leading to increased site and installation completions along with an acceleration of the MMRP by more than two years.

Environmental Performance Assessment System

The Army Environmental Performance Assessment System, managed by USAEC for active Army installations, provides the status of installation environmental compliance and management systems to garrison commanders. USAEC also uses the results to help identify and resolve systemic problems Armywide.

In fiscal 2008, the Army applied a new, standardized model to evaluate the relative risks of each part of the installation's environmental program. Using this new tool, assessments were able to focus limited resources on the areas where compliance issues posed the highest risk.

Using these criteria, EPAS externally audited 26 installations and zeroed in on 182 environmental compliance program areas, known as "media" in the environmental field, on 22 of those installations. In fiscal 2009, EPAS will audit 28 installations.

Participation of installation, region and USAEC staff on the audit teams will help reduce program costs, allowing EPAS to externally audit 292 compliance media at 26 of the 28 installations in fiscal 2009 using the same risk criteria as in 2008.

Twenty-one of 26 installations also received an Environmental Management System audit in fiscal 2008. Beginning in fiscal 2009, all installations undergoing EPAS evaluation will receive an Environmental Management System audit.

What all of this means to you

The Soldiers and Family members living on these installations in the coming decades will not connect their quality of life to a business process, a site inspection or a programmatic compliance action. Nor should they have to.

What Soldiers will see, instead, are installations and nearby communities where the air, land and water are safe for their Families. They will be free to train as they will be expected to fight, on ranges set aside and designed for long-term military use. The transformations we have made will truly sustain the environment for that secure future.

This is exactly the way it should be — seamless and transparent to Soldiers, Family members and civilian employees living and working at the installations.

POC is Neal Snyder, USAEC Public Affairs, 410-436-1655, neal.snyder@us.army.mil.

Col. Maria R. Gervais is the commander, U.S. Army Environmental Command.

Acronyms and Abbreviations	
ACUB	Army Compatible Use Buffer (program)
BRAC	Base Realignment and Closure
EPAS	Environmental Performance Assessment System
IMCOM	Installation Management Command
IRP	Installation Restoration Program
MICC	Mission and Installation Contracting Command
MMRP	Military Munitions Response Program
NEPA	National Environmental Policy Act
USAEC	U.S. Army Environmental Command

Fort Lewis assesses its sustainability goals and metrics

by Brendalyn Carpenter

Fort Lewis, Wash., gave itself a task in 2008 — revise or establish quantifiable metrics for its journey to a Sustainable Fort Lewis. This assignment followed a year of careful assessment in 2007, after which its Installation Sustainability Program members revised the original 12 strategic sustainability goals to eight and created a new Sustainable Community Team.

Experts agree on the basic ingredients of an effective goal: one that requires a length of time and desired end state, and can be measured. Metrics track progress toward reaching a goal and allow adjustments to speed or slow progress in line with external influences, such as new technology or infrastructure.

The six ISP teams fortified their goals by redefining objectives and targets and creating new tools for measurement. The process and resulting metrics, although not perfect, demonstrate the challenges military installations face with identifying and managing the various programs that touch sustainability.

Sustainable Community Team

The Sustainable Community Team was formed when the installation revised its master plan and became an integral part of the master planning process. The installation also recognized a need to expand its vision beyond sustainable features in the built environment, which focused only on achieving Leadership in Energy and Environmental Design standards for new construction.

Thus the team set a broad goal that encompasses all aspects of sustainability — "Create sustainable neighborhoods for a livable Fort Lewis community that enhances the Puget Sound region" — with a desired end state to improve the mission capabilities of Fort Lewis while enhancing the natural environment and creating a vibrant place to live, work and play.

The team partnered with respected planning and engineering firms and conducted visionary planning; solicited community input through multiple charrettes, focus groups and surveys; and produced 12 area development plans for Fort Lewis and one for Yakima Training Center. ADPs provide planners, designers and contractors a user-friendly guide for both short- and long-term planning.

The final Fort Lewis Master Plan incorporates five specific design goals:

- Enhanced mission capabilities
- Sustainable communities
- Walkable neighborhoods
- Identifiable town centers
- Great streets

The team and installation collaboratively developed 38 design principles to support the planning goals. They created a new measuring tool, a neighborhood design snapshot checklist that represents the master plan design principles and ensures consistent implementation of sustainable principles; ties into the five planning goals; and requires LEED standards are met. It also measures the installation's progress toward achieving the Army's triple bottom line for sustainability: mission, community and environment.

Metrics are embedded in the neighborhood checklists that assign a numeric score for each design principle. Army staff and contractors use the checklists to evaluate the areas described in each ADP. The resulting scores are converted to percentages that gauge progress toward achieving the sustainability goal and master plan vision. The neighborhood checklist has flexibility and can be used on any size projects from individual buildings to the entire post.

Acronyms and Abbreviations	
ADP	Area development plan
BOD	biological oxygen demand
ISP	Installation Sustainability Program
HMCC	Hazardous Materials Control Center
LEED	Leadership in Energy and Environmental Design
MBtu	million British thermal units
MCA	Military Construction Army
UESC	Utility Energy Services Contract

Fort Lewis's 25-year sustainability goals:

Air quality

1. Reduce installation stationary source and nontactical motor vehicle air emissions 85 percent by 2025.

Energy

2. Reduce total energy consumption by 30 percent by 2015.
3. Sustain all activities on post using renewable energy sources by 2025.

Sustainable community

4. Create sustainable neighborhoods for a livable Fort Lewis community that enhances the Puget Sound region.

Product and materials management

5. Cycle all material use to achieve zero net waste by 2025

Sustainable training lands

6. Maintain the ability of Fort Lewis to meet current and future military missions without compromising the integrity of natural and cultural resources, both on the installation and regionally.
7. Recover all listed and candidate federal species in South Puget Sound region.

Water resources

8. Treat all wastewater to Class A reclaim standards by 2025 to conserve water resources and improve Puget Sound water quality.

The master plan also includes a form-based code and regulating plan, which provide boundaries for contractors on siting, roadway standards and building envelope. Most importantly, they give solid criteria for how to build great public spaces that tie the whole installation together into a walkable, vibrant and mission-enhancing community.

The centerpiece of the master plan is a new downtown — a cluster of ➤

(continued from previous page)

mixed-use facilities that will support both commercial and residential occupants similar to the urban communities that exist outside the gates. The Army Air Force and Exchange Service will build the 600,000 square-foot Lifestyle Center. Equity Residential, Fort Lewis's privatized housing developer, will construct the 256-unit Town Center.

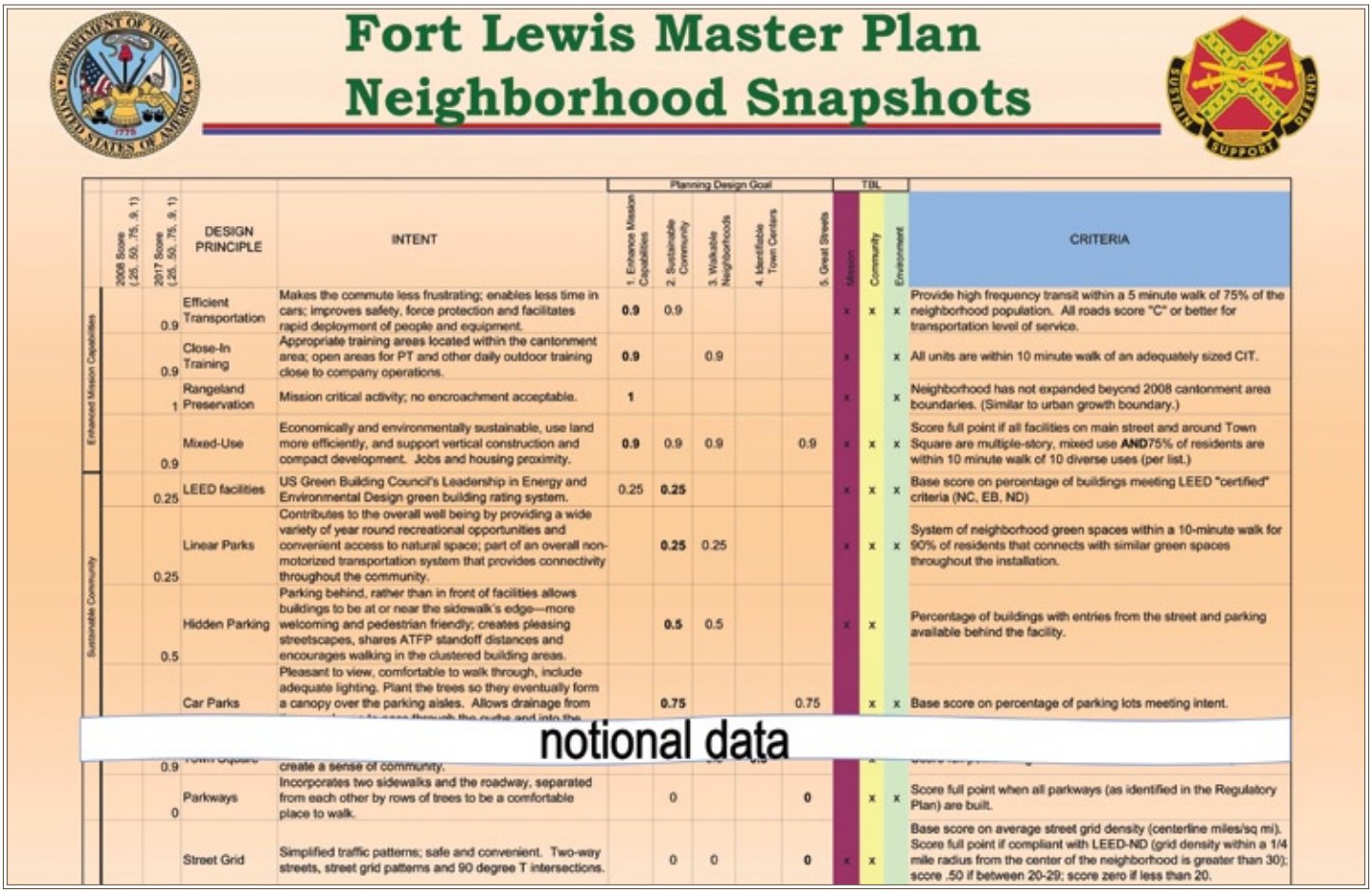
Groundbreaking for the first phase will take place in 2009 with a projected completion date in 2012. Both agencies have participated in the master planning process to ensure their projects support the installation's planning vision.

Sustainable Training Lands Team

The Sustainable Training Lands Team developed an overarching metric that consists of documenting the percentage of acre-days available for military training. By determining the percentage of acre-days available, the team can look at the installation and training constraints that can degrade readiness and are sometimes imposed to prevent or minimize impacts to threatened and endangered species, cultural resources, people, air quality and water resources.

The goal is to manage the negative impacts to have no change in the availability of training lands. The team's success is attributed to partnerships with agencies like the Washington Department of Fish and Wildlife and The Nature Conservancy as well as the Army Compatible Use Buffer Program and Candidate Conservation Agreement.

Because the overarching metric does not tell the story of actual management, the team observed high-use training areas, documented military use and continued management actions needed to sustain the land. For example, in 2008, Training Area 6 had three times more unit training days than 2007 and management actions covering more than 1,500 acres. Management actions such as brush slashing, species enhancement, monitoring and restoration help to mitigate the potential negative impacts of an increased military population and operational tempo, and limitations ➤



Fort Lewis Master Plan
Neighborhood Snapshots

	2008 Score (.25, .50, .75, .9, 1)	2017 Score (.25, .50, .75, .9, 1)	DESIGN PRINCIPLE	INTENT	Planning Design Goal: 1. Enhance Mission Capabilities	2. Sustainable Community	3. Walkable Neighborhoods	4. Identifiable Town Centers	5. Great Streets	TBL: Mission	Community	Environment	CRITERIA
Enhanced Mission Capabilities		0.9	Efficient Transportation	Makes the commute less frustrating; enables less time in cars; improves safety, force protection and facilitates rapid deployment of people and equipment.	0.9	0.9				x	x	x	Provide high frequency transit within a 5 minute walk of 75% of the neighborhood population. All roads score "C" or better for transportation level of service.
		0.9	Close-In Training	Appropriate training areas located within the cantonment area; open areas for PT and other daily outdoor training close to company operations.	0.9		0.9			x		x	All units are within 10 minute walk of an adequately sized CIT.
		1	Rangeland Preservation	Mission critical activity; no encroachment acceptable.	1					x		x	Neighborhood has not expanded beyond 2008 cantonment area boundaries. (Similar to urban growth boundary.)
		0.9	Mixed-Use	Economically and environmentally sustainable, use land more efficiently, and support vertical construction and compact development. Jobs and housing proximity.	0.9	0.9	0.9		0.9	x	x	x	Score full point if all facilities on main street and around Town Square are multiple-story, mixed use **AND**75% of residents are within 10 minute walk of 10 diverse uses (per list.)
Sustainable Community		0.25	LEED facilities	US Green Building Council's Leadership in Energy and Environmental Design green building rating system.	0.25	**0.25**				x	x	x	Base score on percentage of buildings meeting LEED "certified" criteria (NC, EB, ND)
		0.25	Linear Parks	Contributes to the overall well being by providing a wide variety of year round recreational opportunities and convenient access to natural space; part of an overall non-motorized transportation system that provides connectivity throughout the community.		**0.25**	0.25			x	x	x	System of neighborhood green spaces within a 10-minute walk for 90% of residents that connects with similar green spaces throughout the installation.
		0.5	Hidden Parking	Parking behind, rather than in front of facilities allows buildings to be at or near the sidewalk's edge—more welcoming and pedestrian friendly; creates pleasing streetscapes, shares ATFP standoff distances and encourages walking in the clustered building areas.		**0.5**	0.5			x	x		Percentage of buildings with entries from the street and parking available behind the facility.
		0.9	Car Parks	Pleasant to view, comfortable to walk through, include adequate lighting. Plant the trees so they eventually form a canopy over the parking aisles. Allows drainage from [illegible] create a sense of community.		**0.75**			0.75	x	x	x	Base score on percentage of parking lots meeting intent.
		0	Parkways	Incorporates two sidewalks and the roadway, separated from each other by rows of trees to be a comfortable place to walk.		0			**0**	x	x	x	Score full point when all parkways (as identified in the Regulatory Plan) are built.
			Street Grid	Simplified traffic patterns; safe and convenient. Two-way streets, street grid patterns and 90 degree T intersections.		0	0		**0**	x	x		Base score on average street grid density (centerline miles/sq mi). Score full point if compliant with LEED-ND (grid density within a 1/4 mile radius from the center of the neighborhood is greater than 30); score .50 if between 20-29; score zero if less than 20.

notional data

This excerpt from a neighborhood checklist shows how scores are applied to each evaluation. The criteria in the far right column are used to determine appropriate scores in the far left column, which are then transferred to the applicable design goals in the center column. The total scores are converted to percent implemented of each design goal as noted on the snapshot chart. Graphic courtesy of Fort Lewis Public Works

(continued from previous page)

due to candidate and endangered species.

Products and Materials Management Team

Fort Lewis has a goal to cycle all material use to achieve zero net waste. One of the ways the post will get there is by reducing the waste stream leaving Fort Lewis. The installation achieved an overall waste diversion rate of 69 percent in 2008. The metric is the percentage of hazardous and municipal solid waste generated, disposed or diverted.

The Hazardous Materials Control Center accepts hazardous materials and re-issues to other units or organizations, reducing both disposal and procurement costs. The HMCC currently serves 85 percent of Fort Lewis military units and civilian activities, and is on track to deliver 100 percent management by 2010.

The composting facility accepts bio solids, yard debris and wood waste. It converts these items to material that is used for post landscaping and construction projects. Most recently, the program added food waste from 24 dining facilities. Food composting diverts 28 percent of refuse from the waste stream.

One of the major challenges to improving waste diversion is getting every individual to recycle. In the next year, a mandatory recycling policy will be implemented as part of a new recycling regulation that supports an Integrated Solid Waste Management Plan. These tools will help enforce recycling requirements.

Development of some metrics is still in progress. For example, procurement practices that introduce only cyclable material must be supported by a Green Procurement Program where the percentage of green products purchased can be tracked. Fort Lewis is working to establish a program that will identify standards and simplify procurement procedures that result in purchasing and use of less toxic, recycled or recyclable "green" products.

The team has taken some initial steps to coordinate with janitorial contractors and the Fort Lewis Express Store to stock and use less toxic alternative cleaning products on post and to establish the HMCC as a green cleaning products source.

Air Quality Team

Metrics that involve air quality are applied to both stationary and mobile sources. The Air Quality Team measures the amount of fuels consumed, which is directly related to emissions.

The Air program is currently working with the Environmental Protection Agency on an analysis and census of stationary combustion units on Fort Lewis. Stationary source emissions are being monitored to ensure they are within permit requirements. The team is working with McChord Air Force Base for the transition to a joint base to ensure that the Air Emission Permit is properly managed.

In the case of mobile sources, the problem of measurement is compounded by missing data as to the origin of fuel, total fuel use or where the fuel is burned. To determine emission reductions for vehicles, the team measures the use of alternative fuels, such as ethanol and biodiesel, and alternative transportation, such as vanpools, carpools and bicycles.

Rising fuel costs have helped reduce the number of single-occupancy vehicle commutes with a corresponding 26 percent increase in vanpools operating on post in the last year. According to the Washington Department of Transportation's biennial survey, Fort Lewis vanpoolers avoided about 2.2 million round-trip vehicle miles traveled in 2007, eliminating 2.42 million pounds of carbon dioxide emissions.

The team also measures the number of alternative-fuel, electric and hybrid vehicles, and the number of miles they operate. Currently, 47 percent of government-leased vehicles operating on post are alternative-fuel capable. Fort Lewis also has a number of hybrid electric and neighborhood electric vehicles.

Water Resources Team

The Water Resources Team's goal is "Treat All Wastewater to Class A Reclaimed Standards to Conserve Water Resources and Improve Puget Sound Water Quality by 2025." The team measures the amount of pollutants being discharged to Puget Sound, including biological oxygen demand, total suspended solids, chlorine, oil and grease, and metals.

BOD is largely indicative of the rest and can by itself provide a useable yardstick with which the entire suite of pollutants can be judged. Although Fort Lewis uses BOD as its yardstick, the installation continues to measure and monitor all the pollutants that are discharged. If needed, the team's focus can be changed, depending on which pollutant is currently of the most concern and is most indicative of the discharge as a whole.

The goal in the next seven years is to treat wastewater effluent to tertiary treatment standards. In addition, an objective was set to measure the completion of significant projects that improve infrastructure. Benchmarks include construction of various Military Construction Army projects.

These projects include building a new fuel tank purge facility, upgrading a centralized vehicle wash rack to use recycled water and constructing an aviation wash rack that operates with recycled water. These benchmark projects have been submitted to the Public Works Planning Division and are included in the MCA project list, subject to congressional approval and funding.

Energy Team

The Energy Team's goal is to reduce total energy consumption by 30 percent in the next seven years. Metrics that measure energy use are inherently challenging. Almost every aspect of modern life has some relationship to energy, either directly or indirectly. The challenge is to identify measurable activities that clearly correlate to installation energy use.

The team measures the total amount of fuel used by the installation to heat ➤

Europe District delivers in 2008

by Justin Ward

More than ever before, the nation called upon the U.S. Army Corps of Engineers' Europe District in 2008 to respond to new challenges on new frontiers. And the district responded with alacrity, completing the largest mission in its history and proving, once again, that it is an organization of choice for its strategic partners.

New challenges – new frontiers

Eastern Europe was a hotbed of design and construction activity for Europe District in 2008, with 75 new projects in nine countries totaling more than $150 million.

The lion's share of work in Eastern Europe took place in Romania, where the district's new office, established only last year, executed critical projects in support of the U.S. Army Europe-led Joint Task Force-East initiative. There, district employees managed the construction of barracks, company and battalion headquarters, and community support facilities built to sustain up to 2,500 troops on six month rotations.

Soon, the district will set up another JTF-E office in Bulgaria, where $61 million was recently awarded for a permanent forward operating site similar to the one underway in Romania. The buildup will center on Novo Selo Training Area in eastern Bulgaria.

The biggest upsurges in Eastern Europe in the foreseeable future are anticipated in Poland and the Czech Republic, where the district has agreed to establish and staff two new resident offices in support of the U.S. Missile Defense Agency's proposed ballistic defense system in Eastern Europe. The district's support to the Missile Defense Agency could reach almost $850 million by 2013, when the last construction project is scheduled to be completed.

Elsewhere abroad

Other new challenges on the district's frontiers included $11.5 million in essential border security and law enforcement projects in the war-torn country of Georgia, $6 million in humanitarian assistance projects throughout the Caucasus and Africa, and a host of other invaluable projects throughout six countries on the African continent.

Also on the district's frontier in 2008 were $190 million in projects requested by Israel to help it maintain its qualitative military edge over other countries in the region that threaten its security. The district's most noteworthy support to Israel was essentially a Base Realignment and Closure mission. District engineers worked long hours and used transformational ➤

(continued from previous page)

buildings and provide hot water combined with the electricity used to operate lighting, equipment and processes, and divides that number by the number of total square feet of building space. Simply put, energy use is measured as millions of British thermal units per thousand square feet of facility space.

Fort Lewis used Energy Engineering Analysis Program audits combined with studies by Bonneville Power Administration and steam trap audits to analyze its energy use. Audits were conducted on 20 percent of the 17.3 million square feet of Fort Lewis facilities. From this sampling, which included examples of every construction type on the installation, the team extrapolated an estimated savings and return on investment.

Partnering with Bonneville Power Administration, Fort Lewis intends to execute a Utility Energy Services Contract to finance energy improvements. Under the UESC, the Army's investment of $18 million coupled with utility rebates and incentives will save about 28 percent of energy use and produce a return on investment in 5.6 years.

While plans for energy improvements are still in progress, the priorities have been identified. The first upgrades will be to lighting; heating, ventilation and air conditioning systems; and steam systems.

Fort Lewis also measures the percent of renewable energy sources. While 25 percent of the post's 208,000 megawatt-hours of annual energy consumption currently comes from the purchase of renewable energy certificates, the post has a goal to supply some of its energy needs through on-site generation.

Additional reductions in energy demand will be achieved through energy conservation measures. A long-range plan for ground-source heat pumps is projected to reduce energy consumption by 670,000 MBtu at an estimated saving of $5.2 million per year.

In the short term, Fort Lewis achieved a $700,000 savings in utility consumption in post housing during the 2007-08 heating season with the Resident Responsibility Utilities Program. This Department of Defense-mandated program encourages energy conservation by establishing a baseline in post housing. Residents who exceed the baseline receive a bill for their overconsumption, and residents who fall below the baseline receive a check for their utility cost savings.

Journey continues

As Fort Lewis keeps pace with the Army's *Strategy for the Environment*, the installation will continue to achieve its strategic, 25-year goals, fulfilling the Army's mandate to sustain the mission for a secure future.

POC is Brendalyn Carpenter, 253-966-1734, brendalyn.carpenter@us.army.mil.

Brendalyn Carpenter is the sustainability outreach coordinator, Fort Lewis Public Works.

(continued from previous page)

thinking to help Israel accomplish one of the largest and most important military projects in its history — the transferring of its Air Force's "mother base" from Lod, located near Tel Aviv, to Nevatim, a small town in the middle of the Negev Desert.

Elsewhere in the Middle East, the district supported more than $61 million in reach-back support to Global War on Terror projects in 2008 and deployed 20 employees to assist with Operations Iraqi Freedom and Enduring Freedom missions.

The district's world class workforce also proved itself by sending two civilian volunteers to support hurricane relief efforts on the Gulf Coast.

Together, these 22 selfless employees displayed the full range of Army values in their missions, deploying despite dangers to provide peace, freedom and comfort to those who needed it.

On the home front

In Western Europe, other district employees showed their spirit of full engagement by being nominated for their recognized service in 2008.

Charles Samuel was the USACE nominee for the 2008 *Black Engineer of the Year Award* in the *Career Achievement (Government)* category. Hiram "Angel" Fernandez was the North Atlantic Division's nominee for a *Hispanic Engineer National Achievement Award* Corporation engineering award.

To continue fostering its culture of achievement, the district started a Leadership Development Program and approved a diverse set of six enthusiastic employees — Angel Acosta, Vanessa Bauders, Klaus Fiedler, Okan Nalbant, Charles Samuel and Francisco Torres — to inaugurate the year-long program.

Also on the homefront, the district family welcomed a new commander, Col. John S. Kem, who accepted the district colors from Col. Margaret Burcham in June.

Acronyms and Abbreviations	
JTF-E	Joint Task Force-East
USACE	U.S. Army Corps of Engineers

Largest mission

Once again, thanks to a strong, performance-oriented culture and an unwavering duty to its customers, Europe District's overall program exceeded its previous year record, turning over more than $1.2 billion in projects for a total of 1,522 actions.

A structural steel installer at the $22 million Ramstein Air Base C-130 hangar bolts together sections of the 355-foot main beam. Photo by James Wofford, Europe District project engineer

Construction awards comprised $730 million of that total, including $383 million in Military Construction for Forward Operating Site facilities, barracks, battalion and company operations facilities, vehicle maintenance centers, school additions, medical clinics and Family housing units throughout European Command.

Nonmilitary construction projects totaled $315 million, including more than $100 million in upgrades to various lodging facilities, commissaries and medical facilities; almost $150 million in small- to medium-sized renovations and planning work for garrison Directorates of Public Works; and roughly $30 million for environmental surveys and services throughout Europe.

Most illustrative of the district's work in 2008, however, was the construction placement. The district turned over to its customers 31 major facilities and 100 small- to medium-sized renovation projects, totaling about $521 million. These projects included control towers, munitions maintenance facilities, inspection stations, schools, child development centers, a host nation base camp, family housing units and numerous other key renovations for Army garrisons across Europe.

Sparks fly as a welder repairs damage to a water tower on Morón Air Base, Spain, where Europe District oversees the safety and quality of housing renovations and provides engineering and safety support on many other projects. Photo by Justin Ward

And the district did all this with aplomb, proving once again that it is the organization of choice for helping its strategic partners solve their toughest engineering challenges.

POC is Justin Ward, +49 (0)611-9744-2720, DSN 314-570-2720, justin.m.ward@usace.army.mil.

Justin Ward is a public affairs specialist, USACE, Europe District.

Huntsville Center missions grow to nearly $1 billion in FY 2008

by Charles Ford

Support to installations worldwide is increasing exponentially as the U.S. Army grows and repositions to meet the needs of today's military. This increased support is apparent at the U.S. Army Engineering and Support Center, Huntsville, Ala. Contracts for installation support projects in fiscal year 2008 totaled nearly a billion dollars, up from $608 million last fiscal year, and $589 million the year before.

Huntsville Center is the U.S. Army Corps of Engineers' Installation Support Center of Expertise. Its project managers partner with Corps districts, Directorates of Public Works, Installation Management Command and other federal agencies on installation support projects worldwide.

The ISCX offers the following programs:

Army Stationing Facilities Support – ASFS provides IMCOM with centralized programmatic support for master planning and Military Construction programming. ASFS leads and coordinates facilities requirements analyses and planning charrettes as Army installations plan to move more than 140,000 personnel over the next five years to support stationing initiatives.

Support includes managing program resources, normalizing costs associated with requirements analyses, planning charrettes and Office of the Assistant Chief of Staff for Installation Management- and IMCOM-directed studies, ensuring product consistency and performing quality assurance of services and deliverables. ASFS provided discrete planning products tasked by IMCOM, including infrastructure assessments, preparation of area development guides and development of specific facility type analyses.

ASFS provided 1,356 economic analyses for relocatable facilities at 39 installations, including lease/buy analyses and source-of-funding determination for relocatable buildings support to Corps districts and to installations, and putting together relocatable facility request packages. ASFS supports Corps Headquarters' execution of MILCON Transformation by coordinating and integrating facility planning, programming and acquisition planning support.

MILCON Transformation/ Center of Standardization – The Corps is reinventing the MILCON process because the legacy standards and processes will not provide timely, cost-effective, quality facilities. The new process provides a greater emphasis on facility planning, facilities and processes standardization, and partnering with industry. Standardizing processes means uniform requests for proposals, acquisition approaches and engineering/construction applications; expanding the use of all types of construction; and maximizing use of industry standards.

The Corps has gone to product-line, design-build, indefinite-delivery-indefinite-quantity contracts. A product line is a specific type of facility, for example, a child care center. Centers of Standardization will use a standard design as the baseline for each product line.

Huntsville Center leads COS efforts for 17 facility types and is working with proponents to develop Army standards for physical fitness facilities; fire stations; consolidated fire, safety and security facilities; and Soldier Family support centers. To aid planning and programming of future facilities, Huntsville Center has also prepared template 1391s for Army community service centers, physical fitness facilities, youth centers and fire stations.

These templates are now available through the Programming Administration and Execution processor. Templates include primary line items, areas and unit costs to match the standard designs and the COS contracts being developed.

Template 1391s for child development centers and consolidated fire, safety and security facilities are going through final coordination. Huntsville Center is preparing and refining standard designs for each facility and writing standard RFP language based on the Corps' Model RFP.

This aerial view of the Jabal Military Operations Urban Terrain training site at Fort Irwin, Calif., shows the $12 million site, which includes 41 main buildings and 24 smaller structures. Photo by Capt. Seth Henson

Finally, Huntsville Center has awarded task order contracts for the design and construction of child development centers in the Southeast, Southwest and Northwest regions. These contracts are being used for FY 2008 and future year projects in conjunction with geographic districts.

Huntsville also plans to award a task order contract for the design and construction of physical fitness facilities in the southern states; this will be used for execution of FY 2009 and future year projects.

Ranges and Training Land Program – The RTLP provides program management and engineering support to the Army's Range Modernization Program, which consists of more than 250 Army, Army Reserve and National Guard projects. Support includes establishing engineering criteria and standard designs, initial planning and site selection, facilitating plan charrettes and preparing MILCON programming documentation for Army G-3-funded training ranges.

RTLP provides programmatic oversight and technical support to Corps districts responsible for design and construction of range projects. The new range planning process includes a multi-disciplinary technical team assessment process in the planning charrettes.

Project assessments evaluate the executability of the project from these func- ➤

(continued from previous page)

tional areas: training capability, surface danger zone capability, constructability and standard design compliance, National Environmental Policy Act supporting documentation and issues, telecommunications infrastructure and unexploded ordnance. In addition, the RTLP provides in-house design services to Naval Facilities Engineering Command on range projects for the Marine Corps at Camp Lejeune, N.C.

Utility Monitoring and Control Systems Program – The UMCS Program supports customers at multiple Army garrisons worldwide, Department of Defense and other federal agencies. In FY 2008, UMCS awarded about 400 utility monitoring and control systems contracts for $207 million to push total current workload to an average of 430 projects with a contract value of almost $400 million. This represents a 146 percent increase over FY 2007.

Facilities Reduction Program – During FY 2008, the FRP received the most funds and achieved the highest obligation rate for this program in a single year: $26.5 million to remove 2.7 million square feet. FRP achieved cost savings of more than $4 million. This program provides an overall average facility removal cost below $10 per square foot, including asbestos abatement in most cases.

At the request of Fort Worth District, Huntsville Center awarded the demolition contract for a MILCON project resulting in a 45 percent savings off the 1391 budget amount for the demolition. The program also began a multi-year effort to demolish abandoned, high-risk storage facilities at Aberdeen Proving Ground, Md., using thermal convection to more cost effectively remediate explosive contamination.

In all cases, the excess facilities that were contracted for removal in FY 2008 met the new Army policy to divert no less than 50 percent by weight of the waste stream from landfills. Additional information, estimating tools and project status can be found on the FRP Team Page at the Engineering Knowledge Online web site, *https://frptoolbox.erdc.usace.army.mil/frptoolbox/index.cfm.*

New national IDIQ FRP contracts are scheduled for award this fiscal year. Four regional multiple award task order contracts will be available in the late third quarter. Each region will have a capacity of $60 million over a period of five years. These contracts use an improved acquisition strategy with standardized contract language to ensure use of industry best practices, recycling improvement and waste stream reduction.

Utility Rate Interventions – In a combined effort with the U.S. Army Regulatory Law Office, the Commercial Utilities Program ensures that the costs of utilities services remain fair and reasonable for Army installations. This program, since 1999, has achieved more than $82 million in cost avoidances and savings for the Army and other federal agencies.

Workers build an insulated enclosure around TNT washout facility equipment at Tooele Army Depot, Utah. The FRP project employed, thermal convection to bring down an unwanted ammunition facility. Photo by Debra Valine

Of the numerous utilities' filings analyzed during FY 2008, five were found cost-effective to petition for intervention status. Due to the complexity and issues involved, four cases remain before the respective public service commissions for final ruling. Huntsville Center envisions at least 10 utility rate filings during FY 2009.

Utility rate surveys – In support of and funded by IMCOM, 13 installation utility and assessment surveys identified $839,000 in savings and cost avoidances. These savings primarily result from installations moving to correct tariff schedules, taking advantage of demand-side management actions and installation of energy-management control systems.

Army Metering Program – Program management and acquisition planning was completed in FY 2007, allowing execution to begin in FY 2008. Work included finalizing specifications for advanced metering equipment and awarding contracts to install about 2,800 advanced meters for electricity and natural gas at 28 major installations within the continental United States. Award of a centralized Army meter data-management system software and support contract is expected in FY 2009.

Energy Savings Performance Contracting – ESPC is a major third-party tool used to achieve energy savings. Contractors provide the financing and

Acronyms and Abbreviations	
ACPP	Access Control Point Program
AIE	automated of installation entry
ASFS	Army Stationing Facilities Support
BRAC	Base Realignment and Closure
COS	Center of Standardization
DoD	Department of Defense
DPW	Directorate of Public Works
EEAP	Energy Engineering Analysis Program
ESPC	Energy Savings Performance Contract
ESS	Electronic Security Systems Program
FRP	Facilities Reduction Program
FRR	Facilities Repair and Renewal
FY	fiscal year
IDIQ	indefinite delivery-indefinite quantity
IMCOM	Installation Management Command
IMMSS	Integrated Modular Medical Support Systems
ISCX	Installation Support Center of Expertise
MILCON	Military Construction
MRR	Medical Repair and Renewal
O&M	operations and maintenance
OMEE	Operations and Maintenance Engineering Enhancement Program
REM	resource efficiency managers
RFP	requests for proposal
RTLP	Ranges and Training Land Program
UMCS	Utility Monitoring and Control Systems

(continued from previous page)

perform energy-related infrastructure improvements, and the government repays the contractors from the resultant energy cost savings over a period of up to 25 years. In FY 2008, Huntsville Center awarded ESPC contracts at three installations for a total of $58.3 million.

Over the past 10 years, energy contractors have invested more than $450 million in more than 70 energy-related infrastructure projects at 30 Army installations. The award of a replacement national ESPC contract is expected in FY 2009.

Energy Engineering Analysis Program – EEAP analyzes energy use at installations and provides options for reducing energy consumption. Working with partners, EEAP completed energy surveys at seven Army installations in FY 2008. Since the program began in 2006, 16 surveys have identified about 1,400 potential energy saving projects that when implemented could save the government $70 million per year.

Resource Efficiency Managers – Huntsville Center contracts for and provides oversight of REMs, who increase the effectiveness of installations' energy programs by reducing energy and water costs through the development of cost-effective programs and practices. The program is designed to be self-sustaining in that the savings generated more than offset the cost. Huntsville Center worked with stakeholders to develop a nationwide REM contract projected for award in FY 2009.

Access Control Point Program – The ACPP provides support to the Army's product manager for force protection systems that includes automated installation entry. This AIE effort significantly improves gate security while possibly reducing security guard manpower.

In FY 2008, a task order for the installation of the AIE system at Letterkenny Army Depot, Penn., was awarded. Eight other installations are options under this task order. Six additional AIE site-preparation projects were awarded. Thirty-four other installations are either in the site investigation or the design phase. Thirteen installations in Europe are under contract for installation of ACP equipment.

During FY 2008, more than $68 million was obligated in awards for supporting the ACPP.

Furniture – The Furniture Program manages the procurement and delivery of furniture and furnishings for new and renovated barracks and administrative facilities. Huntsville Center procured barracks furniture for 44,713 Soldier living spaces and 140 administrative buildings in FY 2008.

The program uses standardized and efficient processes, including electronic ordering. The Furnishings Program Management Plan, work instructions, forms and templates can be found at *https://eko.usace.army.mil*, under Virtual Teams, Furnishings Program.

Integrated Modular Medical Support Systems – The IMMSS program provides standardized, modular furniture systems for U.S. Army medical facilities worldwide. IMMSS are reusable, reconfigurable furniture systems that meet medical facility codes and standards and provide finishes that integrate with the Army's interior design standard for medical facilities. The systems are durable, easily cleanable and can be used in office and administrative spaces as well as treatment and exam rooms, and medical support areas.

Other services include design, reconfiguration and restoration of existing systems, maintenance, clinical analysis, fabric panel replacement, inventory and product orientation training.

In FY 2008, 223 orders were awarded, valued at $21.3 million, for 62 facilities. To support Army Base Realignment and Closure medical facility missions in FYs 2009-12, the program will expand to include larger IMMSS systems furniture requirements and non-IMMSS "loose" furniture requirements for Army medical facilities and medical equipment.

Medical Repair and Renewal Program – The MRR Program provides a fast, efficient method for design and execution of all types of medical facility repairs, renovations and minor construction. MRR provides program and project management, engineering, contracting and construction support to DoD and non-DoD agencies nationwide.

The program awarded more than $171 million in medical facility repair and renovation projects in FY 2008 for the U.S. Army Medical Command, the Air Force, the Navy and the Department of Veterans Affairs. MRR also supported the local Corps districts and installation DPWs in the execution of various medical projects that could not be executed with those resources.

Facilities Repair and Renewal Program – FRR provides program and project management, engineering, contracting and construction support to multiple DoD and non-DoD agencies in locations worldwide. The program provides streamlined design-build repair, renovation and minor construction efforts on accelerated schedules.

In FY 2008, FRR highlights included ACP work at eight Army locations, hurricane recovery and mitigation work in Louisiana and Mississippi, barracks improvement projects, Department of Homeland Security projects and total armory renovations for 10 Marine Corps Reserve centers.

Due to BRAC workloads, many districts and DPWs requested Huntsville Center's FRR services. FRR obligated about $92 million for an average fee of 4 percent. Huntsville Center served as an overflow relief valve for the districts and DPWs for these "smaller" O&M projects. Use of the FRR program versus traditional methods resulted in cost and time savings in excess of 20 percent in some cases.

Operations and Maintenance Engineering Enhancement Program – OMEE was established to provide O&M services for DoD medical treatment facilities. The ➤

Corps' master planning community expands to meet Army's needs

by Jerry Zekert

Building and developing great installations that meet mission needs today and tomorrow as well as building great communities that are sustainable, walkable and preserve the environment are tenets of the Army's Master Planning Program. Throughout 2008, the Army's master planning efforts have been focused on:

- ensuring effective comprehensive planning services are provided to support Army needs for today's and tomorrow's Army,
- strengthening the understanding and knowledge of planning throughout the Planning Community of Practice and with others, and
- ensuring practice follows current trends in planning.

This annual report provides a summary of the Army's Master Planning Community of Practice's efforts in meeting these goals.

The U.S. Army Corps of Engineers has been building a set of planning services that are providing the complex planning needs of the Army. Worldwide, USACE has been able, through its supporting districts, to provide responsive planning support to the Army as well as other agencies. Each USACE division has seen its planning support work increase.

USACE has established a series of goals in regards to planning capabilities that ensure all planning program managers are trained in up-to-date practices, and a critical level of planning contract capabilities Department of Defense planning needs are met. While annual reports have not been finalized, it is projected that USACE completed more than $10 million of planning support worldwide in 2008.

Further, these planning products have been recognized for excellence. The Rock Island District was acknowledged for its planning excellence by the Federal Planning Division of the American Planning Association in producing a Reclamation Plan for the Chicago River watershed.

The profession of planning is a complex practice that requires a broad under- ➤

Acronyms and Abbreviations	
USACE	U.S. Army Corps of Engineers

(continued from previous page)

program awards task orders to qualified medical maintenance contractors under the OMEE IDIQ contracts.

Support includes: preventive maintenance, corrective maintenance, minor renovation projects, grounds maintenance, pest management, equipment inventories, condition assessments, aseptic management services and biomedical equipment maintenance. Currently, OMEE provides O&M services for 35 Army, Navy and Air Force medical centers for an annual value of $76 million.

Electronic Security Systems Program – The ESS Program supports customers at multiple Army garrisons worldwide, the National Guard Bureau, Marine Forces Reserves, Department of Homeland Security, DoD and other federal agencies. In FY 2008, ESS awarded about 200 electronic security system contracts for $55.7 million to push total current workload to an average of 100 projects with a contract value of $120 million.

The FY 2008 contract obligation amount represents a 138 percent increase over the $23.4 million obligated in FY 2007. ESS also supported the ACP Equipment Program with AIE projects at six installations through award of 22 additional contract actions for $23 million, bringing total contract obligations supported by ESS to more than $79 million.

Service Support Center – A centralized, fully funded Service Support (call) Center to maintain and provide logistics support for ACP Buy & Drop equipment items for Army garrisons worldwide became operational Sept. 22. The contract provides for delivery of scheduled preventive maintenance, replacement of consumables, testing and compliance with Nuclear Regulatory Commission requirements, equipment operator training, unscheduled service and repair, and replacement of unserviceable equipment

The center is operated by Siemens Government Services and staffed from 8 a.m. to 5 p.m., Monday through Friday, U.S. Central Time, except federal holidays. *Army garrisons are encouraged to submit service requests by e-mail, phone or online:*

E-mail – ACP.callcenter@siemensgovt.com

Online – *https://tsws.siemensgovt.com/acp/index.cfm*

Phone – U.S. calls: 888-747-4435; calls from other countries: dial access code (see below) and 800-747-4435.

Access Codes:

From Japan, depending on telephone carrier, dial 0033-010, 0041 or 0061-010.

From Korea, depending on telephone carrier, dial 001 or 002.

From Germany, dial 00.

The ISCX links state-of-the-art business practices and innovative processes in its partnership with districts and other organizations in providing comprehensive and cost-effective support to DoD installations. Through centralized management with decentralized execution, ISCX leverages program management, engineering, contracting and legal matrix expertise embedded in its virtual project delivery teams.

POC is Stephen R. Lewis, chief, Military Integration Division, ISCX; 256-895-1397; stephen.r.lewis@usace.army.mil.

Charles Ford is the director, Installation Support and Programs Management Directorate, Huntsville Center.

(continued from previous page)

standing of the comprehensive factors that result in an orderly framework for development of communities, i.e., installations. Preferably, a professional planner will have graduated from an accredited planning school or have an extensive understanding of all the factors involved in creating great communities.

In an effort to enhance expertise, USACE has created a set of training opportunities targeted to broaden the understanding of the planning profession. The formal training program consists of three courses — Real Property Master Planning, Advanced Master Planning and Master Planning Visualization Techniques.

Real Property Master Planning provides a broad introduction to the practice of installation master planning. It provides a comprehensive overview of master planning in both a lecture and group exercise format, intermingled with field trips and guest speakers involved in the practices of planning.

Advanced Master Planning provides training in the various aspects of planning, including visioning, developing an area development plan and sustainable development, and applying these planning principles into the planning and development of installations. The class is conducted in a studio environment where the class works on a group project that they present at the end of the week.

Master Planning Visualization Techniques provides detailed understanding of how to use 3-D modeling software to create 3-D images of the communities being planned.

The Real Property Master Planning class was taught in Norfolk, Va., last December with 35 participants. The Master Planning Visualization class was taught in Huntsville in July to 20 students. The Advanced Master Planning was taken out of country this year to both Korea and Germany. More than 55 students participated in the class. The classes were well received by the participants with outstanding feedback.

For 2009, the training program grows. Along with the other classes, a new class will be offered called Master Planning Skills, in which class participants learn how to determine real property requirements. (*Editor's note: See article on page 41 for more information on this symposium and master planning courses in 2009.)*

In addition, the training curriculum is now open to the consultant community. Therefore, more of our consultants can learn about the current practices of planning. Also, plans are in the works to apply for accreditation by the American Institute of Certified Planners of the American Planning Association.

The Master Planning Team also provides training to all garrison commanders on master planning and their role in the planning process. The six-hour training effort includes a two-hour overview of planning principles and a four-hour collaborative exercise in which they apply these techniques to a planning problem. The team provided this training four times last year to 80 garrison commanders.

We also provided training to the Public Works Management Orientation Class.

The Master Planning Symposium provided the forum for the Army's planners to meet and discuss the current practices of planning. The symposium was held in conjunction with the Federal Planning Division Workshop and the American Planning Association Conference in Las Vegas. Eighty planners participated. Next year's symposium is scheduled for April 21-22 in Minneapolis.

To enhance planning awareness, the Master Planning Community of Practice established partnerships with other communities of practice, including architects and landscape architects. Broadening the awareness of planning helps boost the consideration of planning prior to design.

Students in a planning class discuss factors affecting their installation master plan. Photo by Jerry Zekert

To ensure Army planning practices meet current trends in the industry requires getting information out to the broad planning community, championing current planning practices that will improve Army communities and sharing ideas with others. To broaden the sharing of information, the team established the Army Master Planning Portal on Army Knowledge Online.

The portal provides the current information regarding Army master planning. Further, we have established a Master Planning Community of Practice web site that, in conjunction with the Army Master Planning Portal, provides a two-way vehicle to share information. Together with a blog site, these online sites provide an opportunity for dialog among the community members. Also, the updated Master Planning Technical Manual is loaded on the Master Planning Portal, providing a vehicle to share Army Master Planning practices.

To champion new planning techniques, the team has been providing information on how to leverage sustainable planning techniques to build better Army communities. From using area development planning techniques implementing better visioning techniques as well as embracing concepts of 'form-based" coding, we are creating development strategies that are compact in scope in a low-impact strategy that preserves the Army's training properties as well as sustaining precious environmental assets. ➤

Defense Department wages war against corrosion

by Richard Lampo, Vincent Hock and Dana Finney

The Department of Defense launched the Corrosion Policy and Oversight Program in 2003 following a mandate from Congress. With corrosion costing DoD more than $15 billion a year in damage to facilities and equipment, the program's goal is to identify technologies and develop guidance for prevention and mitigation.

"We have to address the military corrosion problem in a precise, methodical way so that we put dollars at the installations where it makes the most sense," said Daniel J. Dunmire, director of corrosion policy and oversight for DoD. "This is a classic case of 'pay me now, or pay me later.' "

The Office of the Undersecretary of Defense for Acquisition, Technology and Logistics is the proponent for the Corrosion Prevention and Mitigation Program. Its Office of Corrosion Policy and Oversight is responsible for addressing the needs and meeting the goals of the program. As such, this office develops Corrosion Prevention and Control strategies for DoD and oversees their implementation through a network of CPC Integrated Product Teams.

The IPTs' charge is to:

* develop and recommend policy guidance on corrosion prevention and mitigation;
* coordinate CPC activities among the military services;
* administer a science and technology program to advance the state of the art in CPC areas;
* ensure that CPC is fully considered throughout the life cycle of DoD assets;
* provide guidance for improving maintenance and training in corrosion; and
* serve as a resource for information on CPC methods and products.

High-density polyurethane- and FRP-clad heat distribution pipes are being analyzed after three to four years in service. Photo courtesy of ERDC-CERL

Each investigative project funded by Dunmire's office is required to show an estimated return on investment.

"We calculate our ROIs using formulas recommended by the Office of Management and Budget. For the past two years, the Government Accountability Office has certified our ROIs as saving $1 billion," said Dunmire.

The U.S. Army Engineer Research and Development Center's, Construction Engineering Research Laboratory provides support to the Office of the Assistant Chief of Staff for Installation Management and the Installation Management Command in the development and execution of the CPC Program for Army facilities.

For fiscal years 2005 through 2008, CERL was involved in 38 projects with a budget exceeding $30 million to help mitigate corrosion at Army and other DoD facilities. Eleven new Army facilities CPC projects are funded for FY 2009.

Selected projects executed in FY 2008 are summarized below.

Ammunition bunker

Japan has highly corrosive environments and heavy annual rainfall. U.S. military installations with underground ammunition storage facilities on the island have large volumes of water seeping through the concrete walls, floors and joints of the ➤

(continued from previous page)

Sharing these ideas requires publishing information in various venues. The team has shared the planning story in many publications, including two articles in the *Journal of Installation Management*, several articles in the *Public Works Digest*, an article in the General Services Administration's *Real Property Policysite* as well interviews with the American Planning Association's weekly radio podcast and other venues. Telling the planning story shows how planning can create great installations.

The Army Master Planning Program has achieved great successes over the year. From creating a framework of sound professional planning support to the community, to implementing a professional curriculum of planning education and championing new planning techniques, the Army Master Planning Program has established a good foundation for continued growth and development.

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

Jerry Zekert is chief, Master Planning Team, Headquarters, USACE.

(continued from previous page)

magazines. This moisture contributes to corrosion of equipment and munitions.

To address this problem, CERL is demonstrating a combination of electro-osmotic pulse and dehumidification technologies.

EOP systems have been used successfully for several years to waterproof below-grade structures such as basements and tunnels. The technology involves placing a series of anode wires into the porous concrete and applying a sequence of positive and negative electrical pulses. The resulting reaction induces cations within the concrete to migrate toward the negative earth, transporting water molecules in the process.

The dehumidification technology is standard commercial equipment that uses dry air to force out moisture.

The technologies will be installed at Kawakami, Japan, to assess performance. CERL has requested approvals from the U.S. Army Technical Centers of Expertise on Explosives Safety and the DoD Explosives Safety Board to test these systems in bunkers.

Project POC is Orange Marshall, 217-373-6766, orange.s.marshall@usace.army.mil.

Heat distribution pipes

Several manufacturers of nonmetallic piping for heat distribution systems are marketing these products as a lower-cost, corrosion-resistant alternative to conventional steel pipes. These newer piping systems have an external cladding — usually high-density polyurethane or fiber-reinforced plastic. While these pipes may appear attractive for preventing corrosion and thermal losses, they have never been subjected to field performance tests.

CERL is conducting in-service assessments of two types of nonmetallic HDS piping at Forts Carson, Colo., and Stewart, Ga. The systems were chosen for longest known length of service at Army installations.

They were partially exposed for examination and assessment, instrumented for monitoring heat loss and then reburied according to recommended industry practices. Conduit air pressure tests also were performed. Using data loggers or remote data access and download, heat loss and native potentials, i.e., corrosive conditions, will be tracked for two years.

Data collected from the test will provide defensible evidence of whether the piping prevents corrosion and heat loss as claimed. If the results are satisfactory, guidance will be incorporated into design and procurement criteria for HDS. The projected ROI from the research is about 12:1.

Project POC is Charles Marsh, 217-373-6767, charles.p.marsh@usace.army.mil.

Composites corrosion, degradation monitoring

Several years ago, Michie Stadium at the U.S. Military Academy, West Point, N.Y., was retrofitted with FRP composite patches to strengthen structural support beams and extend the facility's service life. The composites were installed as part of a test to evaluate their use as noncorrosive, maintenance-free material. Because the long-term performance of the composite is unknown, the ability to monitor its condition in real time would help in determining its remaining service life.

For this CPC project, CERL is demonstrating acoustic guided wave inspection sensors. Acoustic guided wave is an emerging technology for nondestructive evaluation of FRP composite materials. It can indicate the relative condition of the composite structural upgrade and predict the material's degradation and debonding rates.

Several tests, such as radiofrequency sensing, were used to validate EOP's safety in bunkers. Photo courtesy of ERDC-CERL

Data can be extrapolated to predict long-term performance and, therefore, the composite's service life. The expected ROI is 12:1.

Project POC is Orange Marshall, 217-373-6766, orange.s.marshall@usace.army.mil.

Technology transfer

To spread the word about valid corrosion prevention and control technologies, the IPTs use multiple forums, such as technical reports, workshops and the news media. In addition, the CorrDefense web site provides a distribution e-portal as a free service for all persons in industry, academia and government who have an interest in corrosion, especially as it relates to DoD weapons systems, equipment, related commercial assets and infrastructure.

The web site is found at *www.corrdefense.org*. Check out the podcasts while you are there,

POCs are Richard Lampo, 217-373-6765, richard.g.lampo@usace.army.mil; and Vincent Hock, 217-373-6753, vincent.f.hock@usace.army.mil.

Richard Lampo is a materials engineer, Vincent Hock is the Army Facilities CPC Project manager, and Dana Finney is a public affairs specialist, ERDC-CERL, Champaign, Ill.

Acronyms and Abbreviations	
CERL	Construction Engineer Research Laboratory
CPC	Corrosion Prevention and Control
DoD	Department of Defense
EOP	electro-osmotic pulse
ERDC	(U.S. Army) Engineer Research and Development Center
FRP	fiber-reinforced plastic
FY	fiscal year
HDS	heat distribution system
IPT	Integrated Product Teams
ROI	return on investment

Army drawn to customer-friendly design program

by JoAnne Castagna with an introduction by Maj. Gen. Merdith W.B. (Bo) Temple

I am pleased to share this article on Building Information Modeling technology with you. I have been a strong advocate for BIM as a critical tool to support our design, construction and life-cycle management processes. BIM is particularly useful in the preparation of our standard designs under the Centers of Standardization program, as we move towards an adapt-build process.

This article is an excellent example of how our learning-enabled workforce is using innovative tools to improve the project delivery process and satisfy our customers. The effective use of BIM is one of the key technical skills we want to maintain in our capable and competent workforce of the future.

The Army Corps of Engineers is committed to a BIM software platform-neutral approach, and we support industry-based standards like NBIMS — the National Building Information Model Standard, and COBIE — the Construction Operations Building Information Exchange. Our design-build projects requiring BIM-based deliverables can be provided in any Industry Foundation Classes-compatible software format, unless specific program requirements, such as Centers of Standardization, or project circumstances, such as customer preference, warrant specifying a specific platform.

As we continue to use BIM to support our Military Transformation mission of delivering high quality facilities safely, we will work to provide facility operations and maintenance models to our customers. This will help facilitate future discussions about the potential uses of BIM throughout the project life cycle, including energy analysis.

Applying innovative systems-based delivery approaches like BIM will maintain the Corps' leadership in delivering quality, sustainable projects to the Army and the nation.

BUILDING STRONG.

– Maj. Gen. Bo Temple

After the bombing campaign ceased in Kosovo in 1999, the U.S. Army Corps of Engineers was called upon to design and build Camps Bondsteel and Monteith in Kosovo from the ground up.

David Rackmales, a structural engineer with the Corps' New York District found himself working in a tent in the dead of winter in Kosovo designing the camps with a team of project managers and engineers.

"We were working very closely in an intense, energized environment," Rackmales said.

Rackmales experienced that same feeling of working closely and dynamically with a dedicated team while taking part in a Building Information Modeling workshop at the New York District offices facilitated by Bentley Systems, a vendor for BIM, a computer design software.

BIM is a collaborative approach to designing that involves integrating the various disciplines to build a structure in a computer virtual environment. The process allows the design team to work effectively, particularly when identifying potential problems before they arise during construction.

"We came together as a team," said Rackmales, who served as the BIM manager at the workshop.

BIM team members work together side-by-side with a focus on a single design project. The designs are completed at a rapid, intense pace and generally much sooner then it would normally take if each worked individually at his or her work station, which can be in different geographical areas in the country.

Each member is equipped with a state-of-the-art desktop computer. The computers are networked together and contain BIM 3-D modeling software with discipline-specific files for various design disciplines and a master file. The buildings on which they are working are projected onto a large screen, enabling the team to virtually "walk through" the structures during the design process.

"There's an old adage for designers that says, 'Build it on paper first,' " Rackmales said. That advice called for working everything out in hard copy before excavating or buying construction materials.

"Now that we are in the 21st century, we are building things virtually in a 3-D environment; that is, we're building it in electrons first," Rackmales said.

The workshop team included structural engineers, architects, mechanical engineers and electrical engineers who were anxious to learn the new software, BIM methods and design processes.

Collectively, the team had more than 20 years of experience using computer-aided design to create two-dimensional construction plans. Team members also had considerable experience with engineering analysis software, but the BIM software and especially the experience of working together were completely new to them.

The New York District team members used BIM on a current design project involving three buildings for the U.S. Military Academy at West Point, N.Y. While designing these buildings, the benefits of using this software as a team members, including the savings in money and time, became more recognizable as the BIM workshop progressed.

Benefits of BIM

The major benefit of using BIM is ➤

(continued from previous page)

the cost savings to the Corps and customers.

"The real serious money and scheduling savings with BIM comes during construction," said Rackmales. "When we build something virtually beforehand with BIM, we've already resolved 99.999 percent of any construction issues. This seriously reduces the number of requests for information from the field offices during construction.

"Information requests can result in construction modifications, emergency redesigns and work slowdowns, which can cost us and our customer considerable money," he explained.

Living design

A BIM model is not just a computer model made up of lines and points, like a typical CAD model. In a BIM model, the lines, points and other objects all contain design information that can be used and modified over the lifetime of the building — from initial concept design through construction and, ultimately, facility operations and maintenance.

For example, a drawing of a steel beam in a CAD design may just be a collection of lines and points, but in a BIM model, in addition to those lines and points, this beam will be linked to further information, such as the beam's cross-sectional dimensions, weight per unit length and other engineering properties. This beam may also include information on its material make-up, pricing and possibly its manufacturer.

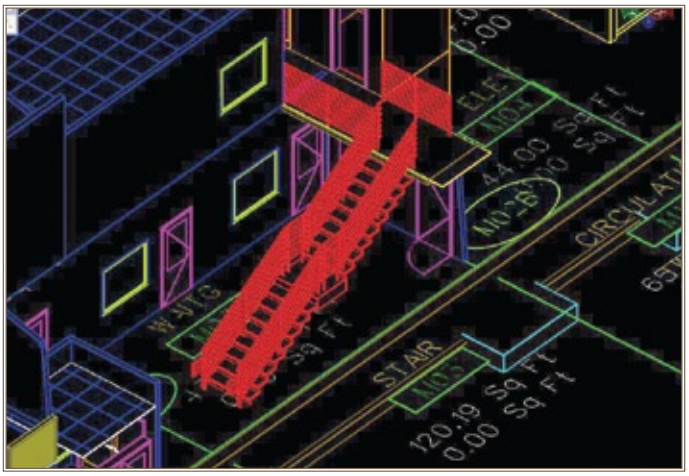
In the case of an entire building, the BIM model stores this and more information for every single element of the project, all of which can be extracted to generate plans, elevations, sections, schedules, material quantities and cost estimates.

Seeing in 3-D

Not only do BIM models contain far more information, but they also allow for more detail then two dimensional drawings.

One of the buildings the New York District BIM team designed included a staircase leading to a door. They viewed the staircase in both two dimension and in 3-D. In two-dimensions, the staircase looks like it was leading to a door, but in 3-D, it was discovered that it really led right into a wall. The team's architect and structural engineer were able to readily resolve this conflict that otherwise may not have been discovered until late into project construction.

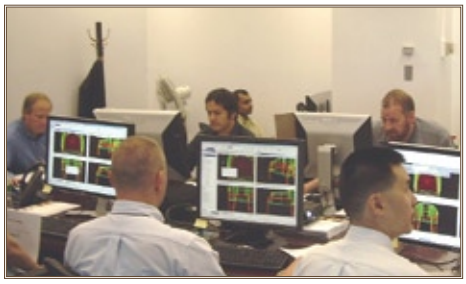
Acronyms and Abbreviations	
BIM	Building Information Modeling
CAD	computer-aided design
USACE	U.S. Army Corps of Engineers



BIM software shows that this staircase is leading to a wall instead of a door, a discovery by the team's structural engineer and architect that allows the team to make the correction in the early design stage, as opposed to during construction. Photo courtesy of New York District, USACE

Team effort

"We're working as a team, sharing our discipline-specific BIM files, through a master file, building virtually together," Rackmales said. "We can see each other's work and spot problems and correct them right away. Any designer can point out that something either doesn't look right or needs some clarification from a different design discipline. We'll then investigate the issue as a team."



The Corps' New York District BIM team collaborates on building design during its BIM workshop. Photo courtesy of Bentley Systems

While designing one of the West Point buildings, the team's mechanical engineer realized that the ceiling height was higher than it had to be and quickly coordinated with one of the team's architects to address this issue.

"The customer would have been heating more room area then necessary and paying for it," said Rackmales.

During the workshop, the team also made adjustments to the building heights after the team realized that the conceptual design plans, created prior to the BIM workshop, conflicted with building height requirements. If not caught, this conflict would have led each team member to design his or her part of the building at different heights. If the situation had not been corrected early, it would have resulted in wasted time, effort and money, and untold confusion, not to mention the problems of addressing such a an issue during construction.

The team also optimized the size of garage doors for the buildings. Team members realized that different sized doors were shown in the conceptual design plans for all of the buildings and agreed to use one size for all.

"BIM made our job easier because we were able to design one best-fitting garage door frame instead of several different ➤

Workshop draws BIM vendor demonstrations

by Beth Brucker and Bill East

How does existing commercial software meet the needs of Building Information Modeling? To learn more about those capabilities, the National Institute of Building Science's buildingSMART Alliance, the Federal Facility Council and the U.S. Army Corps of Engineers jointly sponsored a demonstration at the National Academies of Science in Washington, D.C., July 23-25.

The U.S. Army Engineer Research and Development Center-led workshop was organized to demonstrate the capability of existing commercial software to meet three performance-based, open-standard specifications for the exchange of building information. The live demonstrations by commercial software vendors simulated the creation of contractually required deliverables at different project stages.

Acronyms and Abbreviations	
BIM	Building Information Modeling
CERL	Construction Engineer Research Laboratory
CMMS	Computerized Maintenance Management System
COBIE	Construction Operations Building Information Exchange
ERDC	(U.S. Army) Engineer Research and Development Center
IFC	Industry Foundation Class
SCIE	ISpatial Compliance Information Exchange
USACE	U.S. Army Corps of Engineers

The first specification required that the designer provide building space and space measurement and zoning information to aid in the verification of compliance against the owner's architectural program. Within BIM, this requirement is called the "Spatial Compliance Information Exchange," or SCIE.

The second specification required lead design firms to demonstrate that they have complied with design quality control requirements to coordinate architectural, structural and building services design using automated clash-detection software. BIM calls this requirement the "Coordination View Information Exchange," or CVIE.

The third specification required the designer to provide a building space and equipment list in a format that the construction contractor could use as part of its facility hand-over documents. During construction, the contractor adds equipment installation and commissioning information. This information can be directly imported into the installation's Computerized Maintenance Management System. This requirement and the format for this exchange together are called the "Construction Operations Building Information Exchange," or COBIE.

Lyle Fogg, Fort Lewis, Wash., shows how a a typical project's equipment list and specifications are currently handed over to the Directorate of Public Works, which then manually enters the data into its CMMS. The adoption of COBIE and other data exchange standards will put an end to paper deliverables and provide accurate, as-built building and equipment data. Photo by Beth Brucker

At the demonstration event, each software vendor was given the opportunity ➤

(continued from previous page)

ones, which would have added cost and confusion to those performing the construction," Rackmales said. "It's easier for the contractor to purchase the same material and just repeat the same frame rather than worry about constructing several different frames.

"The more building elements we reduce from unique to repetitive, the more we reduce any potential confusion during construction, and right away, we've eliminated a possible request for information or, worse, a claim."

After working together for three weeks, the BIM team had created the same amount of design work that would normally take about three months or longer. After the workshop, the team completed the design plans in less then a week — work that typically takes a month and requires extensive collaboration with team members from various locations.

The Corps is implementing BIM Corpswide. Several districts have used BIM successfully on their civil works and military projects. The Corps also maintains an ever-increasing repository of collected BIM designs, providing districts with the tools to efficiently adapt any project to meet their customers' demands.

Rackmales found his district's BIM Workshop experience to be very rewarding and his team just as tight as the one in Kosovo.

"It was the ultimate team-building experience," he said. "Our team came out of the workshop as a well-oiled BIM machine."

POC is JoAnne Castagna, 917-790-8219, joanne.castagna@usace.army.mil

Maj. Gen. Bo Temple was the deputy commanding general for military and international operations, USACE, until November, when he moved to the position of deputy commanding general for civil works. JoAnne Castagna is a technical writer-editor, New York District.

Bulletin offers way to determine erosion potential of roads, trails

by Michael Denight, Robert Gaffer and Bernie Engel

The Corps of Engineers issued a new Public Works Technical Bulletin that will help military training land managers identify roads and trails at risk for erosion without the need for site visits. PWTB 200-1-43, *Method for Identifying Roads and Trails to Determine Erosion Potential on U.S. Army Installations*, is available on the Whole Building Design Guide web site, *http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_43.pdf.*

U.S. Army training lands have major erosion problems due to roads and trails created by vehicles that deviate from established roadways during training exercises. Damage from erosion can be quite costly.

Estimates for in-stream and off-stream impacts due to sedimentation in the United States exceed $11.6 billion annually. Soil erosion may result in eutrophication (oxygen depletion), reduced water quality, increased fugitive dust, reduced vegetation and ground cover, reduced soil nutrients, altered infiltration patterns and poor quality wildlife habitats.

Acronyms and Abbreviations	
CERL	Construction Engineer Research Laboratory
ERDC	(U.S. Army) Engineer Research and Development Center
PWTB	Public Works Technical Bulletin

The negative impacts from soil erosion can be controlled; however, to do so, the areas with the highest erosion potential must be identified. Often, the most practical and effective means of identification is to use a model. Although the validity of many of these models had been well documented, they had not been tested for conditions that exist on military training facilities.

The U.S. Army Engineer Research and Development Center developed a geographic information system software package to identify roads and trails at risk and estimate their erosion potential. The PWTB describes a web-based decision support program that identifies and calculates the length of unimproved roads and trails, and classifies them into erosion-potential categories without relying on labor-intensive, on-site assessments.

ERDC's Construction Engineering Research Laboratory tested the erosion-potential estimating model by comparing its results with field data collected at 75 sample points. Spearman's rank correlation to compare predicted and observed erosion potential was significant, meaning that the model is a reliable method for predicting erosion potential.

Use of the software package will help inform decisions regarding the costs and benefits of rehabilitation or closure of unimproved roads and trails that could contribute to erosion potentials within affected watersheds.

POC is Michael Denight, 800-872-2375, ext. 6749; michael.l.denight@usace.army.mil.

Michael Denight is an environmental biologist, Land and Heritage Conservation Branch, ERDC-CERL, Champaign, Ill. Robert Gaffer is an agricultural engineer, Weihe Engineers Inc., Indianapolis, Ind. Bernie Engel is director, Discovery Park Center for the Environment, Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, Ind.

(continued from previous page)

to conduct a live demonstration showing how the required data files are exported from the company's software. Following the demonstrations, sample files from each vendor were passed through a file checker program to test the quality and completeness of the exchange. All Industry Foundation Class-based exports passed the testing procedure that included the automated translation of the IFC file to the required spreadsheet format required by SCIE and COBIE.

Software demonstrating exports of at least one of these specifications were: Autodesk Inc.'s REVIT, Bentley Systems Inc.'s Bentley Architecture, Digital Alchemy's Solibri, Onuma Inc.'s OPS, Project Blueprint Ltd.'s ProjectBluePrint and Nemetschek North America's VectorWorks. Nemetscheck announced that its ArchiCAD product would also support these specifications in the near future.

Vendors present for the import of COBIE data were IBM with its Maximo, and TMA Systems. While neither vendor provided a hands-free import of COBIE data, TMA demonstrated a complete import of an operations and maintenance data set, including equipment lists, warranties, replacement parts and job plan data.

Maj. Gen. Merdith W. B. (Bo) Temple, then deputy commanding general for military and international operations, USACE, was present on the final day of the workshop to thank those who participated and to stress the importance of open industry standards. Temple said that this type of workshop was a model for future open-standards development, and cooperation among all the industry stakeholders will be the key to success.

Workshop information is posted at *http://www.buildingsmartalliance.org/news/20080723.php.*

POC is Beth Brucker, 217-373-7293, beth.a.brucker@usace.army.mil.

Beth Brucker is a researcher focusing on BIM at ERDC's Construction Engineering Research Laboratory, Champaign, Ill., and also works virtually with the CAD/BIM Technology Center, Information Technology Laboratory, Vicksburg, Miss. Bill East is a research civil engineer, ERDC-CERL.

Corps opens contracting door at Fort Lewis

by Andrea Takash

In less than five years, the U.S. Army Corps of Engineers, Seattle District's Military Program more than doubled. The dollar amount awarded for military projects grew from $250 million in fiscal year 2003 to nearly $600 million in FY 2008.

With this increased workload primarily at Fort Lewis, Wash., Cheryl Anderson, chief of Seattle District's Contracting Division, developed a strategic move to address the needs of both the district's customers and her employees.

"Contracting Division's Military Branch handles projects under MILCON [Military Construction], Operation and Maintenance projects for the Army and Air Force, and small projects for a variety of customers. The team also serves as the contracting agency for Fort Lewis' Directorate of Public Works," Anderson said.

"The workload has grown exponentially for the Small Projects Team and DPW," she said. "The Military Branch used to award $20 million in DPW contracts and $30 million in small projects. Currently, contract awards for both total approximately $75 to $100 million."

To address this growing contract work, Anderson established the Special Projects Branch at Fort Lewis.

"The establishment of the Special Projects Branch has been in the works for a while," Anderson said. "I placed Patty Ortiz, purchasing agent, and Gayle Hanson, contract specialist, in the area office in October 2007. But the branch wasn't official until Shannan Lewis came on board as the branch chief in June."

Even though the Special Projects Branch is still in its infancy, the staff hit the ground running and made a good impression on customers from the start.

"Once the Fort Lewis team is fully staffed, I expect to experience a level of service unlike Public Works has had before," said Randall Hanna, deputy director of Fort Lewis's Public Works. "I can tell you that all of my engineers are very excited about this new level of service. Until full staffing arrives, Shannan and the Fort Lewis team continue to do the work of 10 with the staff of two."

When the end of FY 2008 approached, Lewis knew they had their work cut out for them. They were in crisis mode with huge requirements that included a lot of expiring contracts. Now that the new fiscal year has started, the team is taking some time to setup sound policies.

"We also will be establishing new contracts to effectively support the growing mission at Fort Lewis," Lewis said. "Each of us in this branch has a vested interest in making this team a success."

Both Ortiz and Hanson agreed with Lewis' assessment of the situation.

Being at Fort Lewis for the end of the fiscal year was a huge benefit, Hanson said. They could go directly to the project managers to discuss any questions or concerns.

"I can't see how it could have been done any other way," Hanson said.

Ortiz explained that in the past, contract specialists faxed the documents back and forth or placed them on the Corps' file transfer protocol web site, an extra step that was no longer necessary.

There are positives for the end-of-the-year crunch, and also for being involved from start to finish on the project.

"DPW has wanted a dedicated presence at Fort Lewis for OMA [Operations and Maintenance, Army] contracts for a long time," Lewis said. "With on-site employees, we can tackle issues right out front of the project. We are at the planning meetings and go to the project site, if necessary.

"Geoffrey Mueller, Office of Counsel, also is here to review contracts from a legal perspective and is a wonderful asset to the team, she added."

Patty Ortiz, a purchasing agent, sits back for a moment in the Corps' Special Projects Branch office at Fort Lewis. Photo by Andrea Takash

In addition to tackling the growing number of contracts at Fort Lewis, Anderson also addressed at two big picture issues with the new branch — the combining of McChord Air Force Base's Base Civil Engineer with Fort Lewis's DPW, and recruitment and retention of contracting specialists.

"Once McChord's Base Civil Engineer office completes the restructuring with Fort Lewis's DPW, I anticipate even more work," Anderson said. "When this happens, Seattle District will have the staff in place to absorb the work from McChord."

As for recruitment and retention, Anderson is well aware that most government agencies maintain a huge demand for contract specialists. The new branch opens up a pool of potential employees who want to work at Fort Lewis.

"Not only does this office enable me to hire from a broader range of people, it also helps me retain the great employees I already have in the division," Anderson said.

Ortiz, who now works closer to home, finds working at Fort Lewis provides many benefits, both personally and professionally.

"It has been quite challenging at times, but also it has been rewarding to meet the customer's needs," Ortiz said. "It also has benefited me after returning from sick leave. It allowed me to be close to my doctors and closer to home."

Acronyms and Abbreviations	
DPW	Directorate of Public Works
FY	fiscal year

Schofield Barracks Family Housing earns LEED Gold

Four home designs at Schofield Barracks, Hawaii, feature the latest in sustainable home design and technology. These home designs are the first U.S. military homes to receive Gold certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program.

"With these homes, we wanted to show that building a house that met rigorous LEED gold certification standards could be done for an average Family home," said Claire Ridding-Johnston, Army Hawaii Family Housing project director. Ridding-Johnston heads the partnership between developer Actus Lend Lease and the U.S. Army.

Many homes that have met the LEED Gold standard are custom luxury homes, she said.

Acronyms and Abbreviations	
AHFH	Army Hawaii Family Housing
LEED	Leadership in Energy and Environmental Design

(continued from previous page)

Limited staffing presents the biggest challenge. Anderson explained that the abundance of contract work at Fort Lewis supports the need for more employees on the front line interfacing directly with the customers and contractors.

"We are affecting positive changes and will be able to do more when we staff up," Lewis said. "I believe we have made significant progress, but there is still a lot of work to do."

POC is Andrea Takash, 205-764-3464, andrea.m.takash@usace.army.mil.

Andrea Takash is a public affairs specialist, U.S. Army Corps of Engineers, Seattle District.

"I think it's wonderful that a few private homeowners have taken the initiative, but we really want to show developers who are building thousands of homes that it is possible to implement sustainable design and technologies," she said. "Doing this on a large scale can have a significant impact on the environment and homeowners."

A LEED-certified home is one that is energy efficient, water efficient, uses efficient landscaping and materials, and is healthy. The AHFH designs offer many features:

Energy efficiency

- Dual-pane windows with a low emissivity coating keep out the heat of the sun's rays and let in the light.
- Energy-efficient compact florescent lights and other fluorescent lights are installed throughout the home.
- Kitchen appliances and bathroom exhaust fans carry Energy Star ratings.
- Solar hot water heaters supply most, if not all, of the hot water a Family needs.

Water efficiency

- Dual flush, high-efficiency toilets conserve water.
- High-efficiency faucet and shower fixtures also save water.
- High-efficiency drip irrigation for lawns helps keep water use down.

Efficient landscaping

- Plants and trees around the homes were specifically chosen because they are native to Hawaii and can tolerate drought conditions.
- The bio-swale, a unique feature, slows rainwater and helps it to be absorbed into the soil.
- An extra parking pad is permeable concrete pavement, which allows water to soak through.

Environmentally friendly materials

- Tile floors are made from a linoleum material that is all-natural.
- Countertops are a solid surface with recycled content that are easy to clean and can be recycled.
- Fiber cement siding contains recycled material and can be completely recycled.
- The structure and the gypsum wallboard all have a high recycled content.

Schofield Barracks Family Housing resident William Brown gets some help from AHFH maintenance technician Baron Loftin to demonstrate how quickly permeable concrete — one of the many LEED Gold features — absorbs water. Photo courtesy of AHFH

Indoor environmental quality

- Air conditioning ducts are sealed during construction to keep them as clean as possible, and air filters are more efficient than standard filters to help maintain quality air.
- Interior paint and caulking have low to no fumes; homes have been flushed with air to lower any remaining fumes as much as possible.
- All wet areas have a special wall board that is water and mold resistant.
- Bathrooms have humidistat/timers for exhaust fans.

"Another initiative important to AHFH is educating our Families about our sustainability initiatives," said Ridding-Johnston. "We do this by educating them about their home and community design, and offer programs that range from curbside recycling to reducing energy consump-

➤

Construction booms at Fort Hood

by Christine Luciano

In today's fast-paced Army, Military Construction is booming. By 2011, more than 50,000 Soldiers and Family members are projected to be stationed at Fort Hood, Texas. The Directorate of Public Works Master Planning Division is creating a holistic real property master plan to support the population increase and make Army life more attractive to Soldiers and their Families.

New Army standards have increased the size of critical facilities to support Army Transformation. As such, Fort Hood has an overall 4 million-square-foot deficit in critical facilities such as brigade headquarters, battalion headquarters, company operations, maintenance facilities, child development centers, barracks, fitness centers and dining facilities. Due to this deficit, units are double occupying already undersized permanent facilities, World War II-wood facilities and relocatables.

Units are also occupying converted dining facilities, medical clinics and shoppettes. These facilities are maintenance intensive and offer little flexibility in providing the space required for office, supply, storage, classrooms, training areas and information systems. The use of these inadequate facilities causes major disruptions to daily command, control and operations of each unit, reducing mission capability and readiness.

A state-of-the-art digital multi-purpose range, where Soldiers will be able to conduct gunnery training in a realistic environment, is under construction at Fort Hood. Photo by Michelle Lenis

Military Construction Army is the primary funding program to reduce these large-square-footage deficits while improving facility standards. Department of the Army priorities for MCA funding for fiscal years 2008-15 are Base Realignment and Closure, Army Modular Force, Global Defense Posture and Realignment, and Grow the Army-related projects. These priorities have been grossly underfunded.

"Fort Hood was not considered a net-gaining BRAC or AMF installation and lost over $305 million of MCA funding to support other BRAC and AMF gaining installations," Lisa Cuellar, Planning Branch chief said. "Fortunately, Fort Hood was considered a GTA installation, which helped offset the MCA funding deficit by almost $250 million."

Annually, Congress funds about $2 billion of MCA projects for military installations worldwide.

"The Army's major military construction program helps installations create enduring communities by ensuring mission asset requirements are fully met," Alan Erwin, Master Planning Program manager said.

Over the next five years, Fort Hood is planning to invest $476.9 million in Military Construction to create sustainable facilities and amenities Soldiers and Families need and want. Construction will include two urban assault courses, an automated multipurpose machine gun range, an aerial fire range, child development centers, a Soldier Family care clinic and GTA unit operational facilities.

Fort Hood's real property master plan is also aligned with the Army's stationing initiatives to support the Warriors-in-Transition Unit mission with new unit operation facilities, barracks and a Soldier Family Assistance Center.

Currently, Fort Hood has more than $118 million in MCA projects under construction. These projects include a new barracks with 304 rooms, a scout qualification training range, a combined arms collective training facilities complex, a consolidated Family and troop medical clinic and two GTA unit operations facilities.

"The short-term and long-term development of Fort Hood ensures mission, quality-of-life and environmental stewardship is achieved," Erwin said. "Quality is an important element DPW focuses on. DPW ensures buildings are built to the highest standards to provide a high quality-of-life for our Soldiers and their Families."

POC is Alan Erwin, 254-287-6407, robert.alan.erwin@us.army.mil.

Christine Luciano is the environmental outreach coordinator, Directorate of Public Works, Fort Hood, Texas.

Acronyms and Abbreviations	
AMF	Army Modular Force
BRAC	Base Realignment and Closure
DPW	Directorate of Public Works
GTA	Grow the Army
MCA	Military Construction Army

(continued from previous page)

tion. Our desired outcome is to provide an environment that will encourage our Families to live greener."

POC is Ann Wharton, communications director, Army Hawaii Family Housing; 808- 275-3177, awharton@armyhawaiifh.com.

From an AHFH news release.

Fort Campbell will have first of 30 new child-care centers

by Jenny Stripling

Next year, life for Soldiers and their Families at Fort Campbell, Ky., will become a little easier when a new child development center for children ages 6 weeks to 5 years is scheduled to open.

The Center of Standardization for child development centers at the U.S. Army Engineering and Support Center, Huntsville awarded the $8.6 million contract July 18 for its construction to Nationview/Bhate JV III of Birmingham, Ala.

The Fort Campbell Child Development Center is one 30 child-care centers that will be built over the next several years at Army installations across the southern United States. The centers will serve three age groups — 6 weeks to 5 years, 6 to 10 years and youths.

The child development centers and youth activity centers will be built according to an Army Standard that was signed in March by Lt. Gen. Robert Wilson, assistant chief of staff for Installation Management. The standard simplifies construction methods and reduces construction costs.

Acronyms and Abbreviations	
COS	Center of Standardization

The COS for child development centers will be out in the field for all design meetings when a Corps of Engineers' geographic district is preparing to design a facility at an installation. The COS will make sure the design meets the standards for such requirements as square footage per child and services offered.

"The ultimate goal is to have a safe, clean and convenient place on installations for the Families to bring kids," said Art Dohrman, COS program manager for the Huntsville Center. "We want to make things as easy as possible for the Soldiers and let them focus on their jobs and not have to worry about taking their children off base for day care and then rushing back to work on the installation."

To procure this contract, Huntsville Center employees worked with external team members including Headquarters, U.S. Army Corps of Engineers; the Fort Campbell Garrison; the Corps' Louisville District; and the U.S. Army Family and Morale, Welfare and Recreation Command, the customer and proponent.

Roger Young is the Source Selection Board chairman for the Southern Region Child and Youth Services facilities contract acquisition. Young assembled the team of experts who evaluated multiple contractors and selected those considered a best match for the projects and contracts.

"The team worked long hours to develop design standards for these facilities that reflect the current national certification standards for child-care facilities," Young said. "This project was truly a team effort.

"We are confident that we are providing Soldiers outstanding facilities where their children are safe, secure and well cared-for," Young said.

POC is Art Dohrman, 256-895-1623, arthur.g.dohrman@usace.army.mil.

Jenny Stripling is a public affairs specialist, U.S. Army Engineering and Support Center, Huntsville, Ala.

A Building Information Model rendering shows the new child-development center design approved by the U.S. Army for children up to 5 years old. Graphic courtesy of Huntsville Center

Fort Benning earns award for strides toward sustainability

by Sarah Dearman

The Partnership for a Sustainable Georgia presented Fort Benning, Ga., with the Partner of the Year award in September. The partnership presents this award annually to recognize a partner's outstanding accomplishments.

"Fort Benning stood out as a role model in the Partnership for a Sustainable Georgia for demonstrating overall excellence by decreasing its impact on the environment, volunteering to improve the community and serving as a national leader in land-use planning for ecosystem protection, green building construction and material recovery," said Suzanne Burnes, manager of the partnership.

"We look to see other organizations in Georgia follow their lead," Burnes said.

Fort Benning has been actively implementing pollution prevention activities for more than a decade. In the last year, it made significant advancements to improve air and water quality. In addition, it helped clean up the community by removing 122 bags of trash from the Chattahoochee River and surrounding areas. Fort Benning employees also reached out to local schools to help educate students and encourage recycling.

Fort Benning joined the Partnership for a Sustainable Georgia in 2004. As a partner, it has been challenged to become an industry leader in the efficient use of natural resources and the reduction of negative environmental impacts. After starting as a Bronze Partner, Fort Benning progressed to the Silver level in 2006.

The partnership offers four levels of participation: Champion, Bronze, Silver and the highest, Gold. The level for each business or organization is based on initiatives already in place as well as those slated for completion. The partnership also offers a variety of incentives, including cost savings through increased efficiencies, potential regulatory flexibility, free technical assistance and training, and access to networking and mentoring among peers, state and local officials.

Remediation of three low-water crossings, like this one, was one of the projects that decreased environmental impact on training areas at Fort Benning. Photos by Johnny Markham, Fort Benning

The low-water crossing sites were remediated with articulated concrete slabs, constructed with cable concrete, which allows for movement of the track vehicle. The cable concrete is placed underwater on the river bed to minimize the disturbance caused by the tank. Entrance and exit slopes are also hardened reducing suspended solids released into the waterway.

The Pollution Prevention Assistance Division, a nonregulatory agency of the Georgia Department of Natural Resources, manages the Partnership for a Sustainable Georgia.

POC is Tony Westbrook, 706 545-1960, tony.wesbrook1@us.army.mil.

From a Georgia Department of Natural Resources news release.

Corrosion prevention on the waterfront

by Eugene Arter

An amazing engineering feat will be accomplished in the beautiful waters that surround Hawaii, home of the U.S. Army Garrison Hawaii. The challenge is to prevent rapid erosion of man-made concrete structures that are in contact with seawater.

Called "dolphins," these stand-alone structures consist of a concrete mass supported by concrete steel-reinforced piles. Dolphins are used to guide and moor vessels for the Army and Navy.

Hawaii's dolphins corrode when a condition called "rapid spalling" occurs as the heavy concentration of seawater salts attack the steel-reinforced concrete. Hawaiian seawater, besides having a high salt content, also has a high concentration of oxygen, which supports the growth of sea life and reefs. But this very same water also attacks man-made cement structures and, in a short time, erodes the engineered strength creating an unsafe condition.

To find a way to extend the useful life of these expensive harbor structures, a joint study and demonstration project is underway at Kawaihae Harbor, Hawaii. The partners involved with this project include the USAG Hawaii Directorate of Public Works, Pohakuloa Training Area, Naval Facilities Engineering Command and the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory.

Acronyms and Abbreviations	
CERL	Construction Engineer Research Laboratory
USAG	U.S. Army Garrison

The study is funded at $950,000 — 50 percent from the Office of the Secretary of Defense and 50 percent from the Installation Management Command.

The technology being tested on these dolphins is a commercially available composite corrosion prevention wrap. This system works by both providing cathodic protection via an embedded zinc mesh and serving as an abrasion-resistant, strengthening barrier for the steel-reinforced concrete piles.

The demonstration design will be applied to the two outermost dolphin pier supports, with the innermost dolphin used as a baseline for comparison. The inner dolphin has no stresses placed upon it because when USAG Hawaii's landing support vessel ties up at Kawaihae Harbor, it is not used.

Divers install a composite wrap, a mesh material that provides cathodic protection, on dolphins at Kawaihae Harbor. Photo courtesy of CERL

When the composite corrosion prevention wrap is in place on the piers supporting the outer dolphins, the system will be 100 percent solar powered. This will include the data collection system, which will upload daily results of the corrosion study via satellite to computers located at CERL in Champaign, Ill.

The data will also be accessible to USAG Hawaii field engineers on a web site. The study results will be transferred for public use when the project is completed.

The goal is to provide an economical and feasible way to extend the useful life of the piers used throughout the military and civilian world. The annual cost for addressing corrosion of piers at military installations alone exceeds $99 million dollars. So it can be expected that this project — the first such application in the Army — will have great interest in the waterfront maintenance world

POC is Eugene Arter, 808-656-4542, eugene.arter@us.army.mil.

Eugene Arter is the facilities manager, Directorate of Public Works, U.S. Army Garrison, Hawaii.

Dolphins in the Kawaihae Harbor are being used to study a composite wrap's effectiveness in protecting against corrosion. Photo courtesy of USAG Hawaii

Fort Benning saves energy with wireless control of outdoor lights

by Michael L. Aident, Steve Dudley and Vernon Duck

Fort Benning, Ga., continues to update its Energy Management and Control System to improve system performance and reliability and, ultimately, to save on energy costs. A wireless controls system was initially installed as part of the EMCS at Fort Benning in the mid-1980s to allow operations personnel to manage electrical load shedding during times of peak energy demand. Since that time, the EMCS has expanded to include hard-wired, Ethernet-based direct digital control systems as well as state-of-the-art bidirectional wireless controls.

The new wireless control system provides operations and maintenance personnel with information and data needed to remotely monitor and control outdoor lighting systems, such as those at physical training fields and school crossing lights, as well as monitor building mechanical systems. The EMCS currently uses hard-wired, networked and wireless control systems to monitor and control various heating, ventilation and air conditioning systems and lighting systems throughout the post.

Acronyms and Abbreviations	
DDC	direct digital control
EMCS	Energy Management and Control System
HVAC	heating, ventilation and air conditioning

The old

Fort Benning recently upgraded from the Dorsett Infoscan 2000 wireless FM control system to a wireless controls system that provides for bidirectional communications capabilities. The Infoscan 2000 system was installed in the 1980s to turn on and off school crossing lights, field lights and the HVAC for various buildings. The system included a control room server with the controls software application and an operator work station.

All control functions originated from the EMCS control room via the Infoscan 2000 server. The control software communicated via custom designed and fabricated printed circuit boards to a high power transmitter that operated in the UHF range.

An antenna mounted on a water tower broadcasted the unique codes generated by the control system to the receivers located at the lights and buildings. One antenna served the entire post.

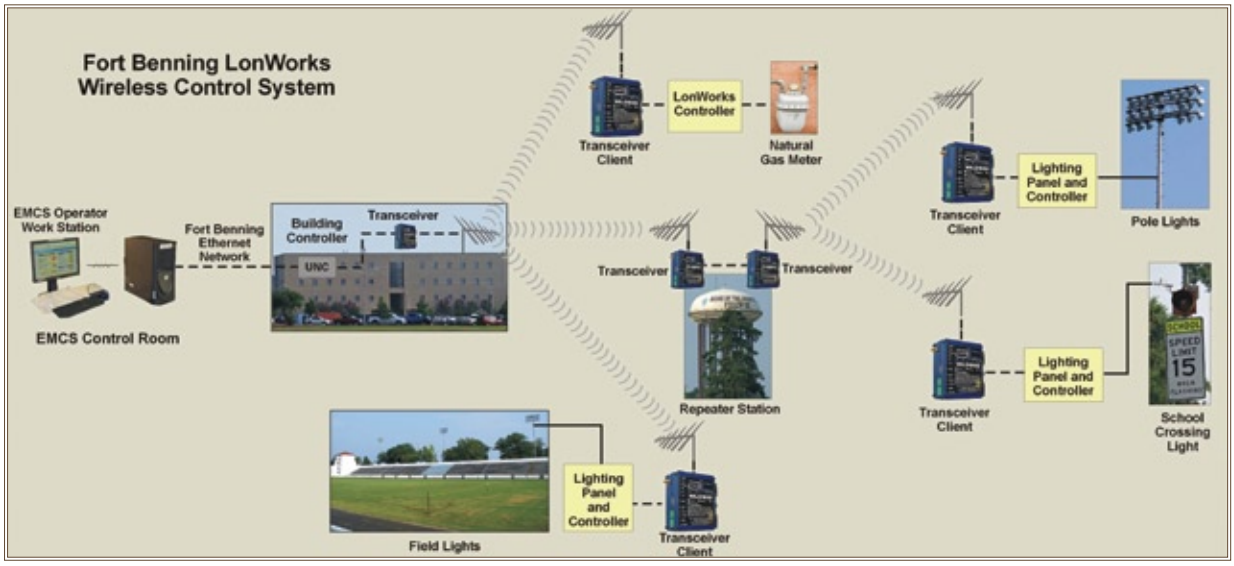
Simulated status feedback was displayed in the EMCS control room. Lights on a panel board would indicate that a code was transmitted, but there was no feedback that the system or device being controlled actually turned on or off.

The Infoscan 2000 system components located in the control room consisted of antiquated components and software that could not be upgraded without replacing the entire system. Based on its age, it was determined that one or more of the components was about to experience a catastrophic failure. As it turned out, about four months after installing the new wireless control system, the Infoscan 2000 server failed.

The new

The new wireless control system uses bidirectional transceivers that receive and transmit data. These transceivers use the LonWorks protocol to communicate between a local LonWorks controller and the EMCS control room server. The data stored on the server can be seen by any work station at Fort Benning that has an authorized user ID and password.

The new system operates in the 900 megahertz frequency range implementing frequency-hopping, spread spectrum technology and data encryption standards. The transceivers operate as a transparent device on the control system network without ➤



The Fort Benning wireless control system currently has four base stations and four repeater stations that cover most of the post. Graphic by Michael Aident and Linda Hall

(continued from previous page)

residing as a "node" on the network. The LonWorks wireless transceivers are AIC Wireless model WLD-900.

The main components of the wireless control system include:

Enterprise server – Control room computer server containing the archived data from logs created by local web servers (building controllers). The enterprise server contains control system interface software that allows the EMCS operator to monitor the system, observe alarms and turn on and off the lights. The server can also be programmed with schedules for the lights.

Ethernet network – Used to allow building controller to communicate with the enterprise server. All user-manipulated control communications flow through the network.

Building controller – Contains the program and schedule to turn on and off the lights. The building controller will operate even if there is an outage of the Ethernet network or enterprise server. The building controller communicates via a twisted-pair cable with LonWorks controllers and a base station transceiver for wireless communication with other remote wireless clients and client networks.

Base station transceiver – Provides interface between the hard-wired LonWorks controls system and the remote-mounted transceivers. The base station exchanges information and data with multiple client transceivers. Information exchange is wireless via antennas located at both the base station and the client transceiver.

Client transceiver – Located at each device or network that will be controlled via the system. Information and data is exchanged wirelessly between the client transceiver and the base station transceiver. The client transceiver is hardwired via twisted-pair cable to a local LonWorks controller.

LonWorks controller – The controller contains stand-alone logic that operates and monitors lights, a natural gas flow meter and an electricity totalizing meter. The controller can be configured with a number of input types, including an analog input so that an analog value — natural gas flow rate or electric meter total flow — can be continuously transmitted via the system back to the central control room enterprise server.

Repeater station – A repeater station is used for those applications where a client transceiver can not communicate with the base station due to distance or other obstruction. A repeater comprises two WLD-900 radios wired back to back via twisted-pair cable. One of the transceivers is addressed as a client to the base station while the other is addressed as a new base station to communicate with other remote clients.

The retired Infoscan 2000 wireless control system operated much like an FM radio and was powerful enough so that the signal could be picked up almost anywhere on post, including indoors. The new LonWorks wireless control system is capable of operating in non-line-of-sight situations. However, extended ranges require line of sight between transmitter and receiver.

The transceivers typically have a range of a mile or so but this can vary based on topography and obstructions. In one application at Benning, the transceiver is communicating about three miles between a natural gas meter station and a repeater that then transmits another three miles to a base station.

It is possible that a hill, structure or even tree could block the transceiver from receiving the transmitted signal. For most applications at Fort Benning, a high gain directional antenna was required to communicate between the client transceiver and the base station.

Advantages

Since the new wireless system has the capability for bidirectional communications, the local panels were designed to provide status feedback for the controlled devices, typically lights. Alarms are provided in the EMCS control room on the operator control station if the operational and command statuses of associated logic control points are different. If the lights are on when they should be off, or off when they should be on, the control system will provide the EMCS operator with an alarm.

Another significant advantage of the new system is that it can be used to transmit analog and pulse signals in addition to a digital, discrete signal as required for on-and-off control of a device. Basically, the wireless system can be used in most any application where a hard-wired control cable is used.

The wireless control system was initially installed at Fort Benning to control only the school crossing, field and basketball court lights. The system has since been expanded to continuously monitor from the EMCS control room the chiller status and the natural gas and electricity use rates. For the natural gas and electric meter installation, pulses are transmitted so that a flow rate and total flow can be determined in the EMCS control room.

The Fort Benning wireless control system currently has four base stations and four repeater stations that cover most of the post. This system controls lights at 12 school crossings and 13 fields and courts.

It is estimated that Fort Benning is saving about $200,000 annually in electricity by using the wireless system to remotely turn on and off the field and basketball court lights. It is anticipated that the wireless system will continue to grow at Fort Benning for those control applications where it is not economically feasible to install a hard-wired LonWorks or Ethernet network.

POCs are Steve Dudley, 706-392-6102, George.Dudley1@conus.army.mil; Michael Aident, 865-694-7333, michael.aident@shawgrp.com; and Vernon Duck, 706-545-0922, vernon.duck@us.army.mil.

Steve Dudley is the resource manager, Shaw Environmental & Infrastructure, Fort Benning, Ga.; Michael Aident is a controls engineer, Shaw Environmental & Infrastructure; and Vernon Duck is the energy manager, Directorate of Public Works, Fort Benning.

by Kimberly Welch

The days are getting shorter. The temperatures are cooling. Winds are less predictable, and heavy rain showers are far more frequent. *Ho`oilo*, the wet season, has come to Hawaii, and for the Oahu Army Natural Resource Program, this is the time of year to plant.

Since the program's inception in the Directorate of Public Works nearly 13 years ago, OANRP staff look forward to this time of year with great anticipation. It is a time to plant hundreds of endangered native Hawaiian plants in the forest of their origin. Over the years, the dedicated OANRP staff have re-introduced to the forests of Oahu an estimated 4,706 endangered plants — representatives of the 51 endangered plant species that OANRP protects and conserves on Army land.

This planting season, from December through February, the OANRP hopes to successfully raise that re-introduction number by another 500. Horticultural staff members are carefully inspecting more than 2,000 plants in the program's endangered plant nurseries, selecting only the most robust candidates for the journey back into the forest.

Under the protective care of rare plant specialists and horticultural staff, these plants started out having their every need tended to. Young propagules in petri dishes grew into seedlings in sterile, temperature-controlled "growth chambers" that strongly resemble giant refrigerators.

The seedlings were eventually transferred to pots with special growing medium and placed in either the low-elevation (920 feet above sea level) or mid-elevation (2,000 feet) nursery depending on the plant's place of origin. Here, plants became acclimated and receive constant care from trained horticulturalists who orchestrate measured amounts of water, sunlight and pest control support.

Each of the 500 plants destined for re-introduction must be strong enough to exist on its own in the native Hawaiian forest. The selected plants will soon be riding into the wilds on the backs of OANRP field technicians. While still in their pots, plants will be carefully packed into specially designed backpacks that enable field techs to hike them into remote forested areas.

Acronyms and Abbreviations	
OANRP	Oahu Army Natural Resource Program

This endangered native Hawaiian lobelia, Cyanea acuminate, has been successfully re-introduced to the forest by staff of OANRP. Photos courtesy of OANRP

Shovels, trowels and even gas-powered augers will be packed in as well, enabling staff to dig planting holes into the island's rocky soil. On some days, plants, staff and their tools will get a lift from a contracted helicopter to the more inaccessible ridge-top and summit locations.

Mathew Keir, OANRP rare plant specialist, uses a gas-powered auger to drill planting holes in the forest on the island of Oahu.

Considering all of the effort that goes into getting the plants this far, the actual planting locations must be selected with great care. When ever possible, re-introductions are placed within areas that have effective exclosures in place. The OANRP employs a skilled crew of fence builders who work year-round to install functional barriers in the mountains that keep introduced feral goats and pigs from entering and destroying fragile native forests.

Within each of these exclosures, OANRP field technicians and volunteers spend much of the time leading up to *ho`oilo* removing invasive weeds from the forest. Removal of aggressive plants such as the introduced strawberry guava (Psidium cattleianum) or Koster's curse (Clidemia hirta) frees up valuable growing area and nutrients for the endangered re-introductions.

Once the proper planting sites are selected and protected, holes are dug, and plants are carefully placed in the ground. The last act of direct human intervention comes with the addition of soil-drenching water, gathered in jugs from strategically placed rain-water catchment systems in the forest. From this point forward, these endangered plants will be left to thrive on their own.

Staff will revisit each plant the following year to monitor its success but will not ➤

Reuse water to reduce demand, ensure sustainability

by Richard Scholze

Over the past year, with the Midwest floods and coastal cities inundated by hurricane surges — water everywhere — the fact that the Earth has a finite freshwater supply may not be obvious. However, exponential population growth, changing weather patterns and pollution of available water resources are exerting unprecedented demands on water supplies around the world.

An important way to reduce demand on potable water supplies is to reuse wastewater for nonpotable applications. Many military installations, especially those in water-short regions, have been recycling water for several years.

To further reduce demand at installations and meet future needs, Directorates of Public Works should consider all possible options for reusing wastewater and plan to incorporate water reuse into the design of new wastewater treatment plants whenever possible. It is more economical to implement reuse from the initial stages of plant operation rather than to retrofit reuse into the processes later.

Water reuse is a global phenomenon and has been rapidly expanding. A variety of factors are driving water reuse and requiring additional water supply sources: drought; increasing population; higher municipal, industrial and agricultural demand; dependence on a single source of supply; and others.

In the United States, no federal regulations or standards cover water reclamation and reuse. Responsibility falls to the states, with many now requiring reuse feasibility studies for expanding municipalities.

Channeling rainwater runoff to beneficial uses, such as bioretention for landscaping, is one way to recycle. Photo courtesy of U.S. Army Corps of Engineers

The focus in the United States is on nonpotable reuse since direct potable reuse is not practiced. For nonpotable reuse, it is essential to match reclaimed water quality with the intended use. The most important aspect of water reuse is protection of human health.

For example, irrigation may require undisinfected secondary treatment of the water, disinfected secondary treatment or disinfected tertiary level of treatment depending upon the type of facility or crops being grown. Cooling tower and air-conditioning use may need disinfected ➤

(continued from previous page)

be there to intervene. Height and basal stem measurements will be taken and recorded. Health of plants will be noted.

As the years progress, each plant's reproductive status will be observed and recorded as well. It is not uncommon for the discovery of flowers and even fruit production on these re-introductions to elicit a round of "high-fives" and a few whoops and hollers among staff.

Each year, the OANRP staff becomes intimately connected to these fragile floras, following each plant's progress from seed to re-introduction. A Hawaiian proverb eloquently puts this connection into words: *He keiki aloha na mea kanu*, which means, "Beloved children are the plants." Like proud parents on graduation day, the season of rains, *ho`oilo*, is a time for OANRP staff to rejoice in how far these plants have come and to dream about their future.

POC is Kimberly Welch, 808-656-7641, kwelch@hawaii.edu.

Kimberly Welch is an environmental outreach specialist, OANRP, U.S. Army Garrison Hawaii.

Sustainable design and development registration now required

by Harry Goradia

Headquarters, U.S. Army Corps of Engineers issued a policy Sept. 25 requiring all projects for fiscal year 2009 and beyond that require achievement of Silver level of Leadership in Energy and Environmental Design to be registered with the U.S. Green Building Council.

Registration of the project with USGBC allows use of LEED-Online and LEED Letter templates to document and track project progress toward achieving Army Sustainable Design and Development goals. It also offers the additional advantage of USGBC support in credit interpretation and rulings.

The recently passed Energy Independence and Security Act requires 5 percent of projects to be certified by an independent third party. Most federal agencies are using USGBC as that third party. USACE is working with the Office of the Assistant Chief of Staff for Installation Management to establish a process for meeting this requirement. In the meantime, according to Engineering and Construction Bulletin 2008-27, all projects should be assumed to be good candidates for formal certification at any time during project execution or after completion should Headquarters, USACE or Department of Army decide to do so.

ECB 2008-27, *Sustainable Design and Development Registration and Certification*, is posted on the Whole Building Design Guide web site, *http://www.wbdg.org/ccb/ARMYCOE/COEECB/ecb_2008_27.pdf*.

Acronyms and Abbreviations	
ECB	Engineering and Construction Bulletin
LEED	Leadership in Energy and Environmental Design
USACE	U.S. Army Corps of Engineers
USGBC	U.S. Green Building Council

POC is Joanne Qualey, Sustainable Design and Development team, Headquarters, USACE, 202-761-8900, joanne.m.qualey@usace.army.mil.

Harry Goradia was the team leader, Sustainable Design and Development, until October when he moved to the Energy Community of Practice, Headquarters, USACE.

(continued from previous page)

secondary or tertiary treated wastewater. Recreational contact may require disinfected tertiary treatment, and groundwater recharge may require disinfected tertiary treatment, while nonfood bearing trees can use undisinfected secondary effluent from a wastewater treatment plant.

The lowest quality water is generally directed towards landscape irrigation. This is one of the best uses of reclaimed water — on installation parade grounds, recreation fields, landscaped areas, golf courses and housing areas. Following the tenets of sustainability, the best practice is to incorporate cascade water usage where water is used once and then reused or recycled to a use that requires water of a lesser quality.

Wastewater can also be collected at the wastewater treatment plant and treated to various levels of quality and transported via an independent distribution system for appropriate purposes. It is important to have dual distribution systems, which is easily accomplished with new construction.

Potential ways in which water can be reused

Category	Typical Application
Irrigation	Parks School yards Highway medians Golf courses Cemeteries Parade grounds Athletic fields Building landscapes Crops or vegetable gardens
Industrial recycling and reuse	Cooling water Boiler feed Process water Construction
Groundwater recharge	Groundwater recharge Saltwater intrusion control Subsidence control
Recreational/ environmental uses	Lakes and ponds Marsh enhancement Stream flow augmentation Fisheries
Nonpotable installation uses	Fire protection Air conditioning Toilet flushing Water features

In addition to irrigation, industrial operations provide the other major potential reuse options, with central energy facilities, wet scrubbers and boiler make-up all targets that would otherwise use potable water. Vehicle washing is another large consumer of recycled water. Central vehicle wash facilities use a wastewater recycle concept that adequately treats the water for reuse, saving hundreds of millions of gallons per year at installations.

Toilet flushing is another viable option. In this case, besides using treated wastewater, rainwater captured from rooftops can be used with minimal treatment.

Other actual or potential applications for military installations include: man-made wetlands, groundwater recharge, stream augmentation, aquifer storage and recovery, and saltwater intrusion barriers along coasts.

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

Richard Scholze is a researcher, U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory, Champaign, Ill.

Do your buildings draw contaminants from below ground?

by Mark J. Fisher

What should installation managers know about soil vapor-intrusion exposure at installations with volatile organic contaminant-contaminated sites? Let's start with basic questions and progress from there.

What is vapor-intrusion exposure? Vapor-intrusion exposure is human exposure to VOC-contaminated soil vapors that have migrated into inhabited buildings. One of the physical features defining VOCs in general is their volatility — the ease with which they evaporate and diffuse into air. When there is a source of VOCs present in soil or VOCs are present in groundwater, VOCs naturally tend to evaporate into the air space between soil particles, which is called soil vapor. The VOCs become a component of, thus contaminate, soil vapor.

Under the right meteorological and building-use conditions, soil vapors are drawn into buildings through cracks and other opening in floors, floor slabs and other foundational features. This migration causes VOC exposure when soil vapors are contaminated with VOCs and the building is inhabited.

When should Army installation managers be concerned about the vapor-intrusion exposure pathway? Installation managers should be concerned when inhabitable buildings are used or placed near or directly over VOC-contaminated soil or groundwater. Generally, buildings located less than 100 feet from the VOC source are considered vulnerable.

How should Army installation managers assess and mitigate vapor-intrusion problems? They should evaluate the location of existing and potential future structures relative to the location of VOC-contaminated soil and groundwater at the facility. To more thoroughly gauge the vapor-intrusion threat, a manager should employ the support of a qualified environmental cleanup technical team to perform a vapor-intrusion evaluation at existing and potential future buildings that are above, or will be located within 100 feet of, VOC-contaminated soil or groundwater sources.

Acronyms and Abbreviations	
VOC	volatile organic contaminant

Pipes installed in floor slabs allow contaminated soil vapors to be drawn into a piping system and escape to the outside of a building. Photo by Mark J. Fisher

Facility managers should expect a thorough vapor-intrusion evaluation performed at a facility level to result in one or more of the following recommendations:

1. Geologic conditions and vapor-intrusion modeling at existing inhabitable buildings indicate conditions are not conducive to VOC-contaminated soil vapor migration into buildings. It is unlikely that vapor-intrusion exposure will occur.
2. Geologic conditions and vapor-intrusion modeling and sampling results indicate unacceptable VOC exposure due to soil vapor intrusion or that a floor, floor slab or foundation failure will result in unacceptable exposure.
3. Inhabitable buildings are not present, but soil vapor migrations conditions favor the potential for vapor-intrusion exposure if inhabitable buildings are constructed. Avoid construction of buildings in affected areas, or include vapor-intrusion mitigation systems in the design and construction of future buildings to avoid the complications of perceived exposure and associated potential future investigations.

Where can installation managers find guidance?

- The Department of Army published ➤

Bulletin guides prioritization of nonnative invasive plant management

by Matthew Hohmann

Prioritization is a critical component of integrated nonnative invasive plant species management planning on Army installations, because impacts are spatially variable and management needs typically exceed the available funds. A new Public Works Technical Bulletin, *Prioritizing Nonnative Invasive Plant Management on Army Installations*, provides an overview of NIS management prioritization on Army installations.

The bulletin includes general recommendations and specific examples of approaches useful for technical experts. This document addresses the highly important, but underemphasized process of prioritizing NIS control efforts.

In the overview and examples included in the PWTB, prioritization is driven by two sub-objectives: minimize impacts to training and natural resources management, and maximize management efficiency. The information provided will help installation personnel anticipate and avoid common pitfalls and errors associated with NIS management, particularly when confronted with multiple and potentially conflicting land-use needs.

Acronyms and Abbreviations	
NIS	nonnative invasive (plant) species
PWTB	Public Works Technical Bulletin

Nonnative invasive species, such as cogongrass, a federally listed noxious weed, create problems on training ranges and require prioritized management strategies. Photo courtesy of Construction Engineering Research Laboratory

The information should also help installation personnel hire or supervise an expert to conduct appropriate prioritization analyses. A formalized, objective and transparent methodology for prioritizing management efforts is especially necessary when multiple stakeholder needs must be incorporated into NIS control strategies.

PWTB 200-1-57 can be downloaded from the Whole Building Design Guide web site, *http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_57.pdf*

POC is Matthew Hohmann, 217-373-5863, matthew.g.hohmann@us.army.mil.

Matthew Hohmann is a project leader, Land and Heritage Conservation Branch, U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.

(continued from previous page)

interim policy, *http://aec.army.mil/usaec/cleanup/dapolicy-vi.pdf*, on vapor-intrusion assessment and mitigation in November 2006.

- The Triservices Risk Assessment Working Group published Department of Defense technical guidance, *http://airforcemedicine.afms.mil/idc/groups/public/documents/afms/ctb_093354.pdf*, in 2008.
- The Interstate Technology Regulatory Commission published technical guidance, *http://www.itrcweb.org/guidance-document.asp?TID=49*, in 2007.
- The American Society for Testing and Materials published vapor-intrusion technical guidance, *http://www.astm.org/Standards/E2600.htm*, in 2008.
- The Environmental Protection Agency issued draft guidance, *http://www.epa.gov/epawaste/hazard/correctiveaction/eis/vapor.htm*, in 2002.

Facility managers are going to find, with increasing frequency, that the vapor-intrusion exposure pathway will need to be addressed, especially at facilities where buildings are located or will be constructed near VOC-contaminated groundwater. Facility managers should take steps to be prepared to address vapor-intrusion exposure issues by evaluating the location of VOC-contaminated groundwater relative to the location of existing and future occupied buildings.

Seek support from qualified environmental professionals at the facility or other servicing environmental organization to gauge the real potential for unacceptable exposure and to make recommendations for pathway mitigation if necessary.

POC is Mark J. Fisher, 402-697-2587, mark.j.fisher@usace.army.mil.

Mark J. Fisher, is a certified industrial hygienist, U.S. Army Corps of Engineers Environmental and Munitions Center of Expertise.

Experimental grease trap waste treatment shows promise

by Gary Gerdes

In response to rising treatment costs off-site, the Directorate of Public Works at Fort Hood, Texas, is seeking an alternative means of separating wastewater from grease and food particles collected in grease traps. The U.S. Army Engineer Research and Development Center devised and pilot-tested an on-site treatment system that uses a grease absorbent readily available at the fort — wood chips.

The U.S. Army Corps of Engineers has published a Public Works Technical Bulletin describing the system and results of initial testing. PWTB 200-1-59 is available on the Whole Building Design Guide web site, *http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215*.

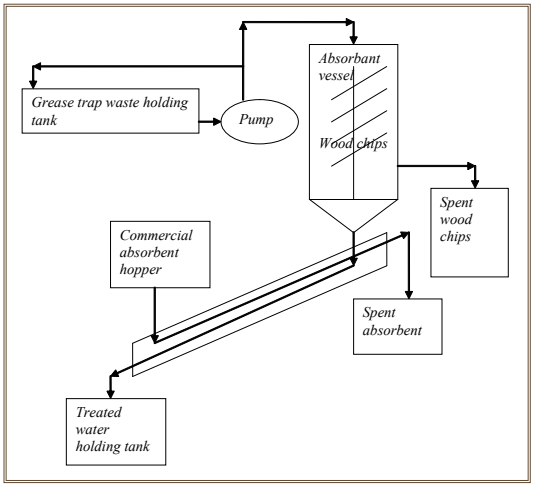
Fort Hood generates some 700,000 gallons of grease-trap waste annually from several dining facilities on post. Grease traps help keep wastewater distribution pipes unclogged by allowing the grease to float to the surface and then become trapped in a large collection tank.

However, when waste is removed from the traps, it still contains too much water to allow the grease to be disposed in the installation's landfill, nor can the waste slurry be discharged to a sewer. The waste has historically been transported off post to a commercial treatment plant. Recent changes in Texas regulations have resulted in a 57 percent cost increase for that disposal option.

The wood-chip absorbent system tested used a two-stage process. Grease trap waste was first run through a large column filled with wood chips, where it was churned to maximize grease absorption onto the chips. Then it was pumped through a second column containing a commercial absorbent for secondary filtering.

The pilot study showed that the test system could be a promising option for treating grease trap wastewater. The second treatment column did not operate properly in the test runs, but this problem could be solved with modifications to the system.

Acronyms and Abbreviations	
ERDC	(U.S. Army) Engineer Research and Development Center
GTW	grease trap waste
PWTB	Public Works Technical Bulletin



This diagram illustrates the treatment process for the wood-chip absorbent system. Graphic by MSE Technology Applications Inc., Butte, Mont.

POC is Gary Gerdes, 217-373-5831, gary.l.gerdes@usace.army.mil.

Gary Gerdes is a research engineer, Construction Engineer Research Laboratory, ERDC, Champaign, Ill.

Study examines water disinfection options

by Gary Gerdes

The U.S. Army Corps of Engineers issued a Public Works Technical Bulletin that describes a study at Fort Bragg, N.C., that sought alternatives to chlorine gas for potable water disinfection. Other installations may benefit from Bragg's experience.

The Fort Bragg drinking water treatment plant uses chlorine gas for both primary and secondary disinfection. While chlorine is an effective, inexpensive disinfectant, there are many negative aspects to its use.

Acronyms and Abbreviations	
ERDC	(U.S. Army) Engineer Research and Development Center
PWTB	Public Works Technical Bulletin

Storing large quantities of chlorine gas triggers regulatory thresholds and requires the facility to submit a risk management plan to the U.S. Environmental Protection Agency for the use and handling of this chemical. The storage of large amounts of this toxic, poisonous gas also presents a security risk to Fort Bragg and the surrounding community.

Another negative consequence of using chlorine-based disinfection processes is the potential formation of halogenated organic byproducts. These disinfection byproduct compounds are regulated by EPA and have limits that have been exceeded at Fort Bragg. The installation has received notices of violation and has been assessed penalties for exceeding these levels.

As a result of these issues, Fort Bragg proposed that the U.S. Army Engineer Research and Development Center investigate alternatives to the current gas chlorine disinfection system. That investigation would recommend a disinfection technology that would:

Will boilers and chillers be specified in future projects?

by Donald Brown

With the unprecedented increase in the cost of fossil fuels and the need for assured energy security, America must turn to renewable energy sources that provide efficiencies and low operational lifetime ownership costs. New England has numerous ground source heat pumps projects that have supplanted the need for fired boilers and chiller systems at universities, hospitals, public schools, court houses, auditoriums, museums, office buildings and other public facilities. These systems do not burn fossil fuels and have thereby eliminated carbon dioxide greenhouse gas emissions and a long list of associated air pollutants.

Responding to presidential executive order policy directives and Army energy conservation guidance, the Pollution Prevention Division of the 99th East Regional Support Command's Environmental Office completed an energy use survey of all operational facilities to determine energy consumption profiles. As a result of the survey, the Area Maintenance Support Activity in Londonderry, N.H., was selected for a remedial geothermal energy retrofit test program. The AMSA is the highest consumer of fossil fuels within the 99th East RSC.

Acronyms and Abbreviations	
AMSA	Area Maintenance Support Activity in
RSC	Regional Support Command

Because of the rapidly increasing cost of energy needed to support the shop, a successful test program is expected to lead to a geothermal-focused design basis for a renewable source of energy that will allow a dramatic reduction in operational costs. The Londonderry AMSA facility geothermal test well will be a pathfinder effort for the Army Reserve and will serve to demonstrate the geophysics and potential energy yields for both the AMSA and the adjacent Armed Forces Reserve Center training complex.

A predesign, life-cycle cost analysis for ground source heat pump retrofit installation projects significant cost savings for the shop through the elimination of fossil fuel purchases. It will also eliminate more than 1 million pounds of carbon dioxide emissions and associated priority pollutants and particulate matter. In addition, should a ground source heat pump system be installed at the Londonderry Armed Forces Reserve Center, another 4 million pounds of carbon dioxide emissions could be eliminated.

Ground source heat pump applications are a proven technology that provide a highly cost-effective and efficient, renewable energy resource. For every unit of energy used to recover heat from the ground, about five units of recovered energy are made available to heat or cool.

This drill rig will be used to install the ground source heat pump at Londonderry AMSA. Photo courtesy of Alares LLC

Through this rapidly evolving geothermal well pilot test program, the 99th East RSC expects to show that boilers, chillers and smoke stacks are no longer cost effective or desirable methods of energy production, and they no longer provide an assured energy posture for the Army Reserve.

POC is Don Brown, 978-796-3912, donald.p.brown@usace.army.mil .

Don Brown is a contractor pollution prevention specialist, 99th East RSC.

(continued from previous page)

1. not pose a threat to force protection by not compromising the ability to adequately disinfect the water,
2. not trigger an EPA risk management plan,
3. not produce further-regulated byproducts, and
4. reduce risk to on-site plant personnel.

The PWTB describes the alternative chemicals tested and the recommendations offered to Fort Bragg. Considering both cost and effectiveness, the preliminary recommendation for Fort Bragg to meet the goals of eliminating chlorine gas and reducing disinfection byproducts s is the implementation of chlorine dioxide disinfection (see table).

PWTB 200-1-63 will soon be available on the Whole Building Design Guide web site: *www.wbdg.org/ccb/browse_cat.php?o=31&c=215.*

POC is Gary Gerdes, 217-373-5831, gary.l.gerdes@usace.army.mil.

Gary Gerdes is a research engineer, Construction Engineering Research Laboratory, ERDC, Champaign, Ill.

Economic analysis results

Technology	Capital Cost	Increased Annual Operating Cost	Net Present Value
NaOCl	$16,370	$19,500	$240,033
MIOX	$276,019	$13,950	$436,024
ClO_2	$64,000	$42,860	$555,601
Ultraviolet radiation	$1,153,000	$11,600	$1,286,051
Ozone	$2,446,000	$184,600	$4,563,347
MIEX® DOC Removal	$3,900,000	$187,000	$6,044,875

Successes and outlook for Career Program 18

by Lt. Gen. Robert L. Van Antwerp

It seems fiscal year 2008 passed by in the blink of an eye. Even with all the challenges over the past year, FY 2008 was an exciting ride for engineers and scientists in the Army.

With that thought in mind, I have two objectives for this article: to give a year-end summary of our successes in the career program and to describe how CP-18 is preparing the battlefield for FY 2009. First, a summary of the past year's CP-18 achievements:

- We executed 97.6 percent of allocated Competitive Professional Development funds, funding 196 training instances in technical, management and leadership courses across the CP-18 community.
- We rejuvenated the CP-18 Leadership Development Program with 13 new candidates from throughout the Army. These highly motivated, mid-level careerists are jumping headlong into the LDP curriculum of formal classroom training, mentoring and six-month developmental assignments outside their current jobs and locations.
  One of these candidates, Dawn Daw from Fort Huachuca, Ariz., just completed her developmental assignment at U.S. Army Corps of Engineers Headquarters, assisting Bob Slockbower and Ed Gauvreau in revitalizing CP-18. I thank Dawn for her perseverance and persistence in adding disciplined thought and action to the career program and wish her great success through the rest of her LDP endeavors.
- We approved 11 candidates for long-term training programs, funded through the Army Civilian Training, Education and Development System. Programs approved included advanced degrees in engineering, construction management, water resources and business administration.
- We approved five candidates for advanced leadership training opportunities, including the senior service colleges and the Army Congressional Fellowship Program.
- We hired about 200 Department of the Army interns for CP-18 throughout USACE, Installation Management Command and other Army activities. Even in a very competitive recruiting environment, the Army has been successful in finding those bright, dedicated students interested in public service.
- We undertook a major revision and refresh of the CP-18 web site, organizing the information to improve accessibility and updating basic program information, including the new Master Intern Training Program.

Acronyms and Abbreviations	
ACTEDS	Army Civilian Training, Education and Development System
BCG	Broad Career Groups
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
FY	fiscal year
LDP	Leadership Development Program
USACE	U.S. Army Corps of Engineers

Lt. Gen. Robert L. Van Antwerp
Photo by F.T. Eyre

In the coming months, we will be adding new professional development maps for each job series, based on a new template developed by Career Program 22. They will be more user-friendly and relevant to current career advancement maps. All of these accomplishments are helping to improve our career program, building an Engineer Team to last that can accept the challenges of current and future Army missions.

As part of our future path, Bob Slockbower, my functional chief representative, has stood up several working groups to study aspects of career development: Recognition, Interns, Journeymen, Recruiting, Regimental Initiatives, Activity Career Program Managers, ACTEDS Plan Refresh and CP-18 Communications.

The purpose is to involve more people and ideas to refresh CP-18, making our career program stronger and more relevant for all careerists. If you have a passion for one or more of these areas, please contact Bob at robert.slockbower@usace.army.mil.

Last, I recently participated on a panel discussion at the Association of the United States Army Convention in Washington, D.C. Titled "Army Civilians in an Era of Persistent Conflict," the panel featured Lt. Gen. Michael Rochelle and Dr. Susan Duncan of the Army G-1, Jim Warner of the Army Civilian University and Dr. Craig College of the Office of the Assistant Chief of Staff for Installation Management.

The short summary is that the Army has tremendous opportunities for civilians but also needs to approach recruitment and development from a new perspective. The Broad Career Groups initiative that will give all Army civilians a proponent for career development is picking up momentum. CP-18 will be joining the BCGs sometime in the next year. More details will follow on that subject.

As part of my presentation, I suggested that everyone read John Maxwell's "Talent is Never Enough." Maxwell discusses 13 attributes that one needs to develop to fully maximize one's potential.

The two attributes I want to emphasize here are *character* and *passion*. In my mind, character preserves your talent and creates a sound foundation to build your talents. Passion energizes your talent. It is what drives people to excel in their chosen profession or vocation. I consider passion of such importance in building the bench that I have turned back referral lists in which I sensed the candidates did not possess ➤

Career Program 18 web site offers more, more, more

by Dawn R. Daw

What is Career Program 18, and how can I get more information? These questions are posed by many engineers and scientists throughout the Department of the Army. The answers can be found at the newly updated CP-18 web site

CP-18 has recently gained new energy and enthusiasm to improve participation in the program from career program managers. This revitalization has improved and reorganized many aspects of the program, including an updated Army Civilian Training Education Developmental System training plan, a new Master Intern Training Plan, new career professional development maps and new strategies on communication.

These developments have also caused the CP-18 team to take a look at the web site, which is managed and maintained for the entire Army by the U.S. Army Corps of Engineers on their Engineering Knowledge Online server. For several years, the web site appearance and content have remained virtually unchanged, except for the occasional addition of a new document.

Over the past several weeks, the team has made significant changes to the web site. While the overall format and layout remain the same, several additions and changes have transformed the website to make it more user friendly.

Two of the significant changes include the addition of new pages, such as the Leadership Development Program, and an events calendar. The LDP page contains information about the program as well as application information and deadlines. The calendar lists important training application deadlines, workshop dates, conferences and meetings.

The new Career Program Manager's Guide, Master Intern Training Plan and professional development maps have also been posted to the site, with more to come. In the near future, the web site will allow users to "subscribe." Users will then be notified via e-mail when changes or additions have been made.

If you have never been to the CP-18 web site or haven't seen it in a while, take a look. It is located at *https://ekopowered.usace.army.mil/cp18/*. This web site refresh is an ongoing change, and suggestions for improvements or additional information that should be added are welcomed and encouraged. Send an e-mail to the webmaster or the POC below.

POC is Dawn R. Daw, 520-533-1867, dawn.daw@us.army.mil.

Dawn R. Daw, a wildlife biologist at Fort Huachuca, Ariz., just completed a six-month LDP developmental assignment at Headquarters, USACE.

Acronyms and Abbreviations	
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
LDP	Leadership Development Program
USACE	U.S. Army Corps of Engineers

(continued from previous page)

passion to really jump into the job.

With all of these initiatives and continuing challenges for engineers and scientists both stateside and overseas, this is an exciting time to be part of CP-18. I charge all of you in the course of your daily jobs to continue incorporating the tenets of what great looks like derived from Jim Collins' book "Good to Great":

- delivering superior performance in all missions;
- setting the standards for our profession;
- having a unique, positive impact on our nation; and
- built to last.

Our goal is to create a more robust career program that benefits all employees at all times in their careers. Join me in moving out and BUILDING STRONG.

Essayons.

Lt. Gen. Robert L. Van Antwerp is chief of engineers, commanding general of the U.S. Army Corps of Engineers and functional chief of CP-18.

Master planning training opportunities offered

by Andrea Wohlfeld Kuhn

Do you want to expand your master planning knowledge and develop valuable skills? Register now for one of the following fiscal year 2009 Proponent-Sponsored Engineer Corps Training courses. Classes are open not only to Army and other federal employees, but also to contractors, private citizens and state, city and county employees.

Real Property Master Planning

Course 075

Dec. 8-12, Norfolk, Va.

This course is an introduction for planners and real property specialists. It provides an overview of the planning process, with an emphasis on general planning principles that are applicable not only to the Army but to all government agencies. Facilitating stakeholder participation, managing a real property planning board, site planning charrettes and sustainable development concepts are highlighted.

Real Property Master Planning Visualization Techniques

Course 948

Feb. 9-12, Huntsville, Ala.

This 32-hour course provides planners with a fundamental overview of the easy-to-use planning visualization tools SketchUp and Google Earth to help plan military installations. Students will receive hands-on instruction on the use of the software and will produce several basic area development proposals using both.

Master Planning Applied Skills

Course 326

June 22-26, Huntsville, Ala.

This class provides an overview and techniques to develop real property requirements and allowances and to assess stationing actions.

Advanced Real Property Master Planning

Course 952

July 27-31, Huntsville, Ala.

Through an intensive, hands-on workshop, students will use a charrette technique to develop an area development plan for a real-world planning problem at an installation. Participants are required to have a fundamental knowledge of master planning and/or real property management.

As part of a master planning class, students tour an urban community. Photo by Jerry Zekert

To register or view course descriptions, go to *http://pdsc.usace.army.mil*. You may also contact Sherry Whitaker at 256-895-7425/7421, sherry.m.whitaker@usace.army.mil; or Andrew Browning at 256-895-7429, andrew.s.browning@usace.army.mil.

In addition, the **Army Master Planning Symposium** will be held April 21-22 in Minneapolis. The symposium offers a venue for the Army's Master Planning Community of Practice to share successes and understand current trends in Army installation planning. The symposium is held annually in conjunction with the Federal Planning Division of the American Planning Association's National Training Conference.

For more information, contact Jerry Zekert at 202-761-7525, jerry.c.zekert@usace.army.mil, or Andrea Wohlfeld Kuhn at 202-761-1859, andrea.w.kuhn@usace.army.mil, or check online at *www.baseplanningpractices.net* or *www.federalplanning.org*.

POC is Andrea Wohlfeld Kuhn, 202-761-1859, andrea.w.kuhn@usace.army.mil.

Andrea Wohlfeld Kuhn is a Master Planning Team associate, Headquarters, U.S. Army Corps of Engineers.

Look us up on the WEB

For an electronic copy of the

Public Works Digest,

go to:

http://www.imcom.army.mil/sites/pw/digest.asp

Reynolds is director of Public Works for national capital area

by Mary Beth Thompson

Clyde Reynolds looked for a new work opportunity — a chance to take on something he had not tackled before. Reynolds found that opportunity in a newly created position in a newly created organization. On Sept. 2, he began his job as director of Public Works for the National Capital Region District of the Installation Management Command.

"I am definitely looking forward to it — the challenge — something that has not been done before," Reynolds said. "Not ever in my career have I had the opportunity to start up a brand new organization. That's why I signed up — a challenge I hadn't had before.

The NCR-D was born July 1 when IMCOM rebalanced its U.S. regions and created the district to manage Army posts in and near the nation's capital. These installations include Fort Meade in Maryland, Forts Belvoir and Myer in Virginia, and Fort McNair in Washington, D.C. When Headquarters, IMCOM relocates to San Antonio, Texas, in 2011, the district will remain and operate out of Washington area offices.

"I never worked at a headquarters, never worked in D.C.," Reynolds said. "It's all new to me."

Acronyms and Abbreviations	
IMCOM	Installation Management Command
NCR-D	National Capital Region District
RIST	Regional Installation Support Team

Clyde Reynolds
Courtesy photo

As Headquarters IMCOM continues to transform and prepare for the move to San Antonio that was directed by Base Realignment and Closure 2005, it is embracing the Regional Installation Support Team concept. According to Reynolds, the NCR-D is, essentially, a live test of RIST.

"Pay attention to what happens at NCR-D," Reynolds advised. "IMCOM West is testing RIST, but NCR-D is doing it for real. Stay tuned."

Serving as the test pilot for new ways of doing business is not unusual for Reynolds. His last position was director of Public Works at Fort Jackson, S.C., where the new web-based financial and accounting system called GFEBS, for General Fund Enterprise Business System, is being tested.

Reynolds will celebrate 27 years of working for the Army in January. He started as an engineer intern at Fort Hood, Texas, in 1982. He relocated to U.S. Army Garrison Hohenfels, Germany, in 1996 and became chief of the Engineering Resource Management Division there.

In 1999, he returned to Fort Hood and in 2001, moved back to Germany. He served as chief of the Engineering Plans and Services Division for three years and deputy director of Public Works for one year at Hohenfels. He moved to Fort Meade to serve as director of Public Works in 2005 and to Fort Jackson in 2007.

Along with his roots in the intern program at Fort Hood, Reynolds received his education in Texas. He earned his bachelor's degree in chemical engineering from the University of Texas at Austin and his master's degree in management science from the University of Central Texas.

How does he approach the challenges that come along with serving as a director of Public Works, for launching prototype systems and for setting up new organizations? Maintaining a positive attitude is key, he said.

"Every day's a new day," Reynolds said. "I wake up every day looking forward to coming to work. No two days are alike. It never gets boring."

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

Temple departs Military Programs

Maj. Gen. Merdith W.B. "Bo" Temple moved from Military Programs at Headquarters, U.S. Army Corps of Engineers across the hall to the position of deputy commanding general for civil works Nov. 21. Maj. Gen. Jeffrey J. Dorko replaced Temple as deputy commanding general for military and international operations. Photo by F.T. Eyre

Dorko takes charge of Corps' Military Programs

Maj. Gen. Jeffrey J. Dorko assumed the responsibilities of the deputy commanding general for military and international operations at Headquarters U.S. Army Corps of Engineers in Washington, D.C., Nov. 21.

"Maj. Gen. Dorko will carry forward the responsibility for policy, program and technical functions in the execution of more than $20 billion of design, construction and environmental programs for the Army, the Air Force, other Department of Defense and federal agencies, and foreign countries," wrote Lt. Gen. Robert L. Van Antwerp in an e-mail message to all Corps employees. "He also will lead our efforts to foster stability and build capabilities across industrialized and developing nations."

Van Antwerp is the chief of engineers and the commanding general, U.S. Army Corps of Engineers.

Dorko came to Corps Headquarters from Baghdad, where he commanded the Corps' Gulf Region Division from October 2007 to October 2008.

"As commander, Dorko oversaw an outstanding unit of Corps employees who completed more than 500 projects in support of the mission of GRD to provide quality, responsive, full spectrum engineering in Iraq," Van Antwerp wrote.

The GRD projects included renovation and construction of hospitals; primary healthcare facilities; municipal buildings; water and wastewater treatment facilities; police stations, border forts, courthouses and prisons; electrical power generation and transmission; distribution systems and roads; seaports and airports.

He graduated from the U.S. Military Academy in 1978 and later received masters degrees in construction management from George Washington University and in national security strategy from the Industrial College of the Armed Forces. Following completion of the Engineer Officer Basic Course, Dorko served from 1978 to 1981 in the 299th Engineer Battalion at Fort Sill, Okla.

Acronyms and Abbreviations	
GRD	Gulf Region Division
USACE	U.S. Army Corps of Engineers

Maj. Gen. Jeffrey J. Dorko
Photo by F.T. Eyre

After the Engineer Officer Advanced Course, he was assigned to the 7th Engineer Brigade, VII Corps, in Ludwigsburg, Germany, where he served on the Brigade staff and subsequently commanded the 503d Engineer Company.

Dorko then returned to the United States and, from 1985 to 1990, served in the Washington, D.C., area — first as an operations officer in the Military Construction Directorate at Corps Headquarters and then as a staff officer in the Executive Actions Division, Office of the Chief of Staff of the Army, at the Pentagon.

Upon his completion of the Command and Staff Course at Fort Leavenworth, Kan., he moved back to Germany and served in the 3d Infantry Division in Schweinfurt. Dorko then returned to the Pentagon where he worked from 1993 to 1995 as the military assistant for Base Realignment and Closure in the Office of the Assistant Secretary of the Army for Installations, Logistics and Environment.

In 1995, he returned to Schweinfurt to command the 10th Engineer Battalion. The battalion, then reflagged as the 9th Engineer Battalion, 1st Infantry Division, deployed in support of Operations Joint Endeavor and Joint Guard.

Dorko attended the Industrial College of the Armed Forces from 1997 to 1998 and subsequently served as operations and plans officer, Dissemination Division, National Imagery and Mapping Agency in Reston, Va.

He commanded the Engineer Brigade, 1st Cavalry Division, Fort Hood, Texas, from July 2000 to August 2002. In August 2002, he became the chief of staff, U.S. Army Maneuver Support Center at Fort Leonard Wood, Mo.

His last assignment stateside before heading to Baghdad was as commander of the Corps' Southwestern Division, headquartered in Dallas.

From Maj. Gen. Jeffrey J. Dorko's official bio and a Nov. 19 e-mail message from Lt. Gen. Robert L. Van Antwerp.

Call for ARTICLES

The January/February 2009 issue of the Public Works Digest will feature

Master Planning and Construction

Deadline is Dec. 11

Submit articles to
mary.b.thompson@usace.army.mil
202-761-0022

U.S. Army Installation Management Command
2511 Jefferson Davis Highway
Arlington, VA 22202-3926
www.imcom.army.mil

IMCOM

U.S. ARMY INSTALLATION MANAGEMENT COMMAND