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At Fort Sam Houston, Texas, historic buildings are undergoing substantial renovations to become the new home of Headquarters, Installation Management Command. Photo courtesy of the U.S. Army Corps of Engineers. Page 20

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IMCOM

U.S. ARMY INSTALLATION MANAGEMENT COMMAND

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IMCOM sustains infrastructure as part of installation sustainability

by Lt. Gen. Rick Lynch

The Installation Management Command integrates sustainability into installation planning, training, procurement and operations to ensure the Army has the installation capabilities it needs — today and in the future. Many sustainable practices have been put into place to better manage resources, conserve and secure energy, and build future capabilities.

A key aspect of sustainability is managing and improving the Army's installation infrastructure. IMCOM is again proving successful by doing the right things towards obtaining sustainable infrastructure.

Sustainment, restoration and modernization

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

FSM also includes major repairs or replacement of facility components, usually accomplished by contract, which are expected to occur periodically throughout the facility life cycle. Major work includes regular roof replacement; refinishing wall surfaces; repairing and replacing electrical, heating and cooling systems; and replacing tile and carpeting.

The Office of the Secretary of Defense funds the Army at 90 percent of the FSM requirements. IMCOM provides the garrisons with 75 percent of its requirements according to the model under the IMCOM Funding Guidance.

To manage essential R&M projects, IMCOM withholds 15 percent of the sustainment funding generated by FSM. In fiscal year 2010, IMCOM plans to execute $240 million to support the Army's R&M immediate requirements.

Lieutenant General Rick Lynch
U.S. Army photo

FY 2010 Barracks R&M Program

IMCOM's plan for barracks R&M is to complete correction of mold-moisture challenges in the Army's Voluntary Army era barracks at Forts Campbell, Ky., Hood, Texas, Bragg, N.C., and Polk. La. Fort Campbell will be completed in FY 2010. The FY 2010 program will also complete nine of 19 barracks at Fort Hood and four of 14 barracks at Fort Bragg. Programmed completion of Hood, Bragg and Polk barracks will continue through FY 2012.

Fort Polk barracks retrofit

The Corps of Engineers' Construction Engineering Research Laboratory worked together with the Corps' Fort Worth District to develop a scope of work for a barrack retrofit strategy. This effort will save energy and reduce risk of mold as well as improve energy efficiency of central energy plants.

The project focused on making the building envelope as airtight as possible by installing better insulation using an exterior insulation finishing system, better windows, enclosed stairs, and continuous air and vapor barriers. The strategy eliminates barracks courtyards to reduce infiltration and heat losses or gains. A new, dedicated outside air system previously tested at Fort Stewart, Ga., was also included as a mandatory retrofit requirement.

The first barrack using this retrofit strategy was tested for air tightness at Fort Polk in May and achieved air tightness of 0.1 cubic feet per minute per square foot at 75 Pascal pressure difference, which significantly exceeds the request for proposal requirement of 0.3 cfm/sqft and the new Army requirement for new construction and major retrofit projects of 0.25 cfm/sqft (ECB 29 2009).

This Fort Polk test demonstrates the capability to achieve air tightness on retrofit projects — a cornerstone to controlling mold, moisture and mildew within buildings and reducing energy consumption.

Acronyms and Abbreviations	
ATIP	Army Transportation Infrastructure Program
cfm/sqft	cubic feet per minute per square foot
FSM	Facility Sustainment Model
FY	fiscal year
IMCOM	Installation Management Command
LEED	Leadership in Energy and Environmental Design
MILCON	Military Construction
OACSIM	Office of the Assistant Chief of Staff for Installation Management
R&M	restoration and modernization
SDD	sustainable design and development
USACE	U.S. Army Corps of Engineers
USGBC	U.S. Green Building Council

Army Transportation Infrastructure Program

The ATIP consists primarily of inspection and evaluation of the Army's transportation infrastructure. This program will ensure safe and reliable structures and facilities that promote the health and welfare of Soldiers, civilians and families and supports the Army's assigned missions.

The program provides inspections and evaluation for 1,659 bridges, 223 dams, 42 airfields, 22 waterfront facilities and 1,500 miles of railroad tracks. It also includes technical support, training and research projects for an annual budget of $8 million.

The FY 2008-09 period was very ➤

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positive in funding for the ATIP. Projects included $60 million to repair tank trails at Fort Bliss, N.M.; $5.7 million to construct tank trails crossings at White Sands Missile Range, N.M.; $5.2 million to replace runway lighting at Henry Post Army Airfield, Fort Sill, Okla.; $4 million for road repair at Fort Hood; $3.8 million to repair vehicular pavements at Combat Aviation Brigade, Fort Bliss, Texas; and $3 million to repair airfield taxiways and runways at Fort Hood.

Centralized management of the ATIP at Headquarters, IMCOM, has proven a success by ensuring public laws are met, efficiencies obtained, consistency and standardization in the evaluation and reporting are achieved, and data can be retrieved from one source. FY 2010 inspections are well underway, and I anticipate improvement to the Army's transportation infrastructure with continued support from the garrisons.

Sustainable development and design

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

In late 2008, the Office of the Assistant Chief of Staff for Installation Management established the Sustainable Design and Development Program to ensure all new construction meets the statutory requirement for green building certification. The Army selected the U.S. Green Building Council's Leadership in Energy and Environmental Design rating tool and set LEED Silver as mandatory criteria for Military Construction projects.

Five percent of Army MILCON projects will be evaluated by a third party, USGBC, and 95 percent will be self-scored. The SDD Validation Committee will spot check these facilities to ensure full compliance with the LEED program.

The SDD committee includes members from OACSIM; Headquarters, IMCOM; Headquarters, U.S. Army Corps of Engineers; the Army Environmental Command; and the Construction Engineering Research Laboratory.

The SDD Validation Team evaluated 15 buildings at 12 installations in FY 2009. That effort proved to be a learning experience for all stakeholders, as the team initially found all 15 projects did not fully meet LEED Silver criteria. Follow-up work by each USACE project delivery team brought 14 of the 15 projects to standard.

Key findings of the FY 2009 SDD Validation Team include:

- Trained, functional and committed project delivery teams produce higher scoring projects.
- Command engagement is essential in achieving high-performing projects.
- Army standards and standard designs must be optimized to achieve Army sustainability goals.
- Selection of motivated and engaged contractors is essential to project success.
- Complex projects involving multiple buildings, contractors, USACE districts or centers of standardization must be carefully coordinated.
- Effective application of energy modeling is vital to achievement of Army energy savings goals and LEED certification.
- Life-cycle cost analysis is essential to identify any trade-offs between sustainability, first cost, life-cycle cost and mission requirements.

The validation team will evaluate 10 projects in FY 2010, nine of which have been completed to date. The FY 2010 SDD Report will be completed by December.

Looking ahead

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

In the meantime, to leverage the current favorable bid savings climate, FY 2012 MILCON projects and projects at less than 35 percent design will be adjusted for increased energy efficiency and include mandatory LEED requirements from among the criteria in the rating system. This change in requirements will help ensure IMCOM achieves success in meeting Installation Management Campaign Plan, Line-of-Effort 6, Energy Efficiency and Security.

Directorates of Public Works must remain current to fast-evolving sustainability, energy-efficiency and water conservation requirements and ensure incorporation of these into all projects. Success lies in the hands of all who are responsible for our infrastructure.

Be proactive by transforming our installations into modern and sustainable facilities to stay Army Strong.

Lt. Gen. Rick Lynch is the commander, IMCOM.

Look us up on the WEB

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

Corps helps Army meet its infrastructure challenges

by Mohan Singh

Army Infrastructure acquisition and management has gone through many innovative changes in the past few years. The adoption of the Utilities Privatization program, the Residential Communities Initiative, Energy Saving Performance Contracts and Enhanced Use Leasing of Army infrastructure systems that are presently excess or underutilized by the Army's mission are just a few examples of the programs that have, in some cases, made a nearly instant impact on improving Army infrastructure to enhance quality of life for our Soldiers and their families and the Army's overall mission.

The Installation Management Command and the U.S. Army Corps of Engineers continue to develop more ground-breaking programs to help the Army keep up with the continuing challenges of acquiring, operating, maintaining and disposing of facilities, utilities, roads, railways and other networks. Our infrastructure security is as important as ever for life safety and continued service to Army missions, in particular those installations that support overseas contingency operations.

Permanent facilities

The Defense Critical Infrastructure Program is identifying many of the nation's key infrastructure and utility assets. The Office of the Assistant Chief of Staff for Installation Management, IMCOM and USACE are major players in the critical infrastructure program and provide valuable and practical information to streamline the processes related to the identification of critical assets. Many installations have upgraded their security apparatus for critical infrastructure systems to reduce vulnerability and disruption.

The Army is serious about closing all vulnerability gaps as soon as possible, but the needs are many. How to prioritize is where the OACSIM, IMCOM and USACE Team makes a great impact.

USACE is a permanent member of

Mohan Singh
Photo by F.T. Eyre

the Services and Infrastructure Core Enterprise, a collaborative, cross-functional team made up of members from more than 15 commands, organizations and staff offices. SICE is co-chaired by the commanding general, IMCOM, and the assistant secretary of the Army for installations and environment.

SICE neither holds nor seeks command authority over its stakeholders. Instead, SICE brings its members together to develop solutions to tough challenges each cannot take on alone. SICE is working, through integration and collaboration, to provide essential services, infrastructure and operational support at the right place at the right time at the right cost.

The American Recovery and Reinvestment Act has provided roughly $220 million to help upgrade the Army's infrastructure. Working with IMCOM Directorates of Public Works, USACE is in the lead in many of the larger infrastructure projects and also assists in the small but more technically complicated projects. Projects range from $60 million to fix the tank trails at Fort Bliss, Texas, to $10,000 to repair runway deficiencies at Fort Bragg, N.C.

New and renovated Base Realignment and Closure and Military Construction facilities have come on line, but the Army's infrastructure still needs work. The ARRA program has been a shot in the arm for meeting this need. USACE will continue

Acronyms and Abbreviations	
ARRA	American Recovery and Reinvestment Act
FOB	Forward Operating Base
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management
SICE	Services and Infrastructure Core Enterprise
USACE	U.S. Army Corps of Engineers

to work with IMCOM to make steady and vital improvements to the Army's infrastructure from an engineering and security standpoint.

Contingency operations

In Iraq and Afghanistan, USACE helps build forward operating bases for U.S. forces and host nation forces and police. There are numerous life safety and security challenges that must be addressed when constructing and providing facility management services to these installations.

FOBs for U.S. forces are operated and maintained by the Logistics Civil Augmentation Program, and facilities for Afghan army and police are operated and maintained by USACE while the Government of Islamic Republic of Afghanistan develops the capacity to takeover this mission.

Because of roadside bombs, small arms attacks and rollovers, force protection planning factors are very critical. The control of the high ground around FOBs is the biggest concern. Many of the sites pose great force protection challenges due to the terrain requiring emplacement of barriers. In addition, ensuring life safety compliance of electrical and mechanical systems as units rotate poses huge challenges if commanders do not enforce strict discipline.

Maintaining utilities such as electricity, fuel and plumbing, is a continuous struggle. Few things can cause morale to drop faster on an FOB than losing electricity because of lack of fuel. A platoon uses more than 50 gallons of fuel in a single day, except in the winter when more is needed for heating. Large 20,000-gallon fuel ➤

Restoration and Modernization Program 101

by Gustavo (Gus) De Jesus

Understanding how the Installation Management Command's Restoration and Modernization Program works enhances the installation's ability to use it to the best advantage possible. Here are the program basics.

The IMCOM sustainment funding allocation is based on the Office of the Secretary of Defense Facility Sustainment Model, which determines the sustainment requirements for all garrisons using their real property inventories as baselines. The Army historically funds sustainment at 90 percent of the FSM-generated requirement. IMCOM funds all garrisons equitably at 75 percent of the FSM requirement, which may be used at the garrison commanders' discretion. The remaining 15 percent of the total Army funding is used by IMCOM to support Restoration and Modernization programs based on Army established capital investment strategies.

The most critical drivers of the FSM in the RPI are the facility category codes and units of measure. The RPI must be accurately maintained and reflect the proper category of facilities so that OSD applies the appropriate cost factors, because the fourth quarter RPI is the locked data used in the FSM.

Gustavo (Gus) De Jesus
Photo by Fort Sam Houston Photo Lab

The R&M capital investment strategies are:

Competitive Sustainment Level Program – Funds directed to the U.S. Military Academy at West Point, N.Y., to comply with a Department of Army agreement to fund base operating system and sustainment, restoration and modernization at specific funding levels so that West Point remains competitive with the other service academies and other institutions of higher learning.

Acronyms and Abbreviations	
IMCOM	Installation Management Command
ISR	installation status report
FSM	Facility Sustainment Model
FY	fiscal year
OSD	Office of the Secretary of Defense
PPS	Project Prioritization System
R&M	restoration and modernization
RPI	real property inventory
SRM	Sustainment, Restoration and Modernization

Metering Program – Funds for installing advanced meters by 2012 where practicable based on OSD guidance, as required by the Office of the Deputy Undersecretary of Defense for Installations and Environment's *Army Metering Implementation Plan* and the Energy Policy Act of 2005.

Storm Damage/Environmental Compliance Deficiency Resolution Program – Self-insurance for storms, fires and other acts of nature, along with environmental compliance deficiency resolution, which is self-insurance for unforeseen environmental deficiencies arising during the execution of SRM projects that put garrisons in ➤

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containers are usually installed at sites and filled using locally contracted fuel trucks brought in by escorted convoys.

Sizing and finding the right generators for the FOBs is another challenging task. A platoon can acquire 220-volt generators from contractors or laterally transfer 110-volt military generators from other units. A platoon FOB, running a satellite Internet system, lights, computers and battery chargers, requires a total of 20 kilowatts.

While gray water plumbing is an easy issue to address, keeping clean water flowing is more challenging. For toilet use prior to septic tank installation, Army personnel use porta-potties. If there are no emptying services available, each Soldier covers the seat with a trash bag, removes and ties off the trash bag when done and disposes of it in a burn pit outside the FOB walls.

To keep clean water moving, wells are dug. The problem then is keeping enough water in the water tanks to maintain sufficient pressure in the pipes. Platoons have overcome this problem by hiring locals to pump water and maintain the water tanks.

For facilities, shipping containers called "connexes" are outfitted for kitchens, bathrooms and offices. The idea is that the whole package, along with connexes for storage and a generator, is modular and more easily transportable.

The kitchen connex is designed with a special burner for rations, a sink large enough to wash pots, counters and cabinets. The wash connex includes two showers, two sinks, a washer and a dryer. Two 300-gallon water tanks sit on top, so that gravity maintains the water pressure. The office connex is wired with six Internet connections, shelves and a desk.

Addressing the Army's infrastructure needs whether at home or overseas, at IMCOM installations or FOBs, USACE support is critical. We are BUILDING STRONG in innovative ways to support the Army's important mission and to improve quality of life for its Soldiers, their families and civilians.

Mohan Singh, P.E., is the chief, Interagency and International Support, Headquarters, USACE.

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noncompliance situations.

Demolition Program – Funds for eliminating excess facilities and structures to reduce fixed installation costs and achieve energy savings as part of the Facilities Reduction Program.

High cost-high visibility projects – Headquarters, IMCOM, insurance to allow support of Army senior leadership execution year priorities and provide assistance for high visibility and high cost projects that are Army priorities but exceed the funding capability of garrisons.

Trainee Barracks Upgrade Program – Funds for projects designed to improve the quality of Soldier life by upgrading and modernizing trainee barracks to current space criteria and design standards.

Permanent Party Mold/Moisture Remediation Program – Funds for correction of the known mold, moisture and vapor challenges of Voluntary Army-era barracks, barracks modernization and R&M projects to upgrade barracks buildings to one-Soldier, one-room standards.

Flagship Program – Funds for modest-sized SRM projects to improve vacant facilities while units are deployed so Soldiers return to better facilities, including barracks; vehicle and aircraft maintenance facilities; administrative, headquarters and operations buildings; dining facilities; fitness centers; and support buildings. Flagship projects should be able to be completed within the deployment window and involve health, life, safety, super preventive maintenance, minor repairs or improvements.

New mission R&M projects – Funds for projects that support new and emerging missions or directly support senior leader priorities.

Transportation infrastructure projects – Funds for projects that repair or replace transportation networks — roads, bridges, dams, airfields, railroads, waterfront facilities, access control points, road storm drainage and tank trails — based on deficiencies noted in the last inspection report. The report should be based on the latest Headquarters, IMCOM-funded inspection performed by the Engineer Research Development Center that outlined the deficiencies and corrective actions required, and the report date along with the deficiencies must be sited in the "Project narrative" block.

Community support projects – Funds for R&M projects for existing Morale, Welfare and Recreation facilities and municipal buildings, such as gyms, libraries, child development centers, fire stations and community youth services.

Energy projects – Funds for bringing all government-owned energy and utility system components from Q4 (Black) and Q3 (Red) Installation Status Report ratings to Q-1 (Green) rating, saving energy and dollars. The ISR is used as the primary yardstick to select projects and measure progress. Only projects for utility systems that have completed the utilities privatization process and been found to be uneconomical are eligible for funding. Exceptions are considered on a case-by-case basis.

According to the 2009 ISR-Infrastructure, the Army R&M backlog was $15.2 billion. The Army has programmed R&M funding in the Program Objective Memorandum 2012-16 to mitigate the current R&M backlog and bring all facilities to a minimum Q-2 (Yellow) condition. If R&M funding is approved, additional resources will be available for basic sustainment.

The fiscal year 2010 R&M Program includes projects from most of these categories. Historically, the 15 percent sustainment funding for R&M projects is between $400 million and $500 million.

For some categories — Competitive Sustainment Level, Metering, Storm Damage/Compliance Deficiency Resolution Demolition and Trainee Barracks Upgrade programs — the funding is directed to Headquarters, IMCOM. For the remaining categories, garrisons submit projects via the Project Prioritization System for funding consideration.

Business rules have been established under the PPS to facilitate the documentation of all categories so each project can compete on its merit in its respective category. A project priority is established at installation, region and Army command levels. ➤

FY10 R&M Checkbook

Description	Rqmt ($000)	Total Rqmt ($000)
Competitive Sustainment Level (USMA)	15000	15000
Metering Program	15000	30000
Storm Damage / Environmental CDR Program	20000	50000
Demolition Program	10000	60000
High Cost / High Vis / Opportunity	60900	120900
Trainee Barracks Upgrade Program (TBUP)	132500	253400
PP Barracks Mold / Moisture Remediation	128750	382150
Flagship Program	166730	548880
New Mission R&M	50000	598880
Trans Infr / Cmty Spt / Energy	50000	648880

This table shows a snapshot of requirements at the start of FY 2010 and represents how IMCOM maintains the R&M checkbook. Graphic by Gus De Jesus

The what, who, how and when of SRM DD Form 1391s

by Tomas Rodriguez

Directorates of Public Works must obtain approval to expend funds on Army facilities. Most of these funds are accounted for within the Sustainment, Restoration and Modernization and Base Operating Support portions of the Defense Finance and Accounting Service system. The basic document for requesting approval is DA Form 4283, *Facilities Engineering Work Request*, which is used for the control and management of real property facilities placed under the DPW's responsibility.

The work requirement is validated by a field facility condition inspection, conducted by the DPW, which establishes the need and identifies the failing condition of the facility. The work classification is used to establish the type of work being accomplished — maintenance and repair, construction or installation of equipment-in-place.

For maintenance and repair projects of more than $750,000, a repair-to-replacement cost analysis determines who has the authority to approve the project. For projects that have a Rep/Rpl of more than 50 percent, this authority rests with the deputy assistant secretary of the Army for installations and housing. These projects require that a DD Form 1391, *Military Construction Project Data*, also be submitted for approval.

DD 1391

A DD 1391 is used to document projects that are beyond the approval authority of the garrison commander,

Tomas Rodriguez
Photo by Gustavo (Gus) De Jesus

similar to the process for Military Construction, unspecified minor MCA, major maintenance and repair, or projects that require special handling. A minor construction project can be financed from appropriations available for operations and maintenance if the project has a total funded cost of $750,000 or less, or if it has a total funded cost of $1.5 million or less and it is intended solely to correct a deficiency that threatens life, health or safety.

It is important to understand that a minor construction project includes all work necessary to provide a complete and usable facility or a complete and usable improvement to an existing facility.

Regional directors have approval authority for LHS construction projects and combined LHS and non-LHS projects between $750,000 and $1.5 million. Region directors also have approval authority for repair projects up to $5 million if the Rep/Rpl ratio is less than 50 percent. If the Rep/Rpl is greater than 50 percent and the cost is more than $750,000, the approval authority is with Headquarters, Department of the Army.

Acronyms and Abbreviations	
DPW	Directorate of Public Works
LHS	life, health or safety
MCA	Military Construction, Army
Rep/Rpl	repair-to-replacement calculation
SRM	Sustainment, Restoration and Modernization

All SRM projects greater than $7.5 million require congressional notification. Because of the required 21-day waiting period and the time needed for processing and review, the DD 1391 for these SRM projects must be submitted to Headquarters, IMCOM, Public Works no later than the first week of August to obtain congressional approval before the end of the fiscal year.

A change in U.S. Code Title 10, Section 2811, now requires the Army to provide an explanation of why replacement of the facility is not in the best interests of the government on projects of more than 75 percent Rep/Rpl during the congressional notification process. Complying with this requirement necessitates a small change in the way projects of more than $7.5 million are documented on the DD 1391.

It is important to distinguish between SRM DD 1391s and those for other programs that renovate, rehabilitate and construct facilities. Many of the DD 1391 tabs for other programs are not required for the SRM DD 1391. ➤

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Installation priority is designated by the senior mission commander or installation commander as a "1-N" ranking for installation projects. *Region priority* is designated by the region director as a "1-N" for all projects in the region. Directors establish their own internal processes for prioritizing projects. *Army command priority* is inputted against SRM projects in PPS. Generally, commands identify and prioritize only their top 20-30 projects.

The PPS is available at *http://pps.hqda.pentagon.mil.*

The IMCOM Public Works SRM Management Branch is working the R&M execution strategy for FY 2011 based on the latest IMCOM leadership emphasis and taking into consideration Army commands' priorities. Garrisons will have the opportunity to submit projects for R&M funding consideration in specific investment categories.

POC is Gus De Jesus, 210-424-8626, Gustavo.dejesus@us.army.mil.

Gus De Jesus is chief, SRM Management Branch, Public Works Division, Headquarters, IMCOM.

Army Dam Safety Program 101

by Ali Achmar and Mike Dean

Garrison commanders are considered to be the owners of the dams and bridges under their control and could be held legally liable for them, according to a 1992 determination from the Office of the Chief of Engineers. That responsibility carries considerable personal accountability, so garrison commanders and their Directorates of Public Works need to be knowledgeable about the Army Dam Safety Program.

The Army Dam Safety Program is governed by Public Law 92-367, as amended by Public Law 104-303, the National Dam Safety Program Act and guidance. The Office of the Assistant Chief of Staff for Installation Management is responsible for Army dam policy, and the Installation Management Command commander is the safety officer for dams that belong to or are controlled by Army garrisons.

Policy is set forth in Army Regulation 420-1, *Army Facilities Management*, Chapter 7, Transportation Infrastructure and Dams. The Army reports to the Federal Emergency Management Agency every two years on the Army Inventory of Dams, the condition of the dams, training, and repair and maintenance performed.

Acronyms and Abbreviations	
ATIP	Army Transportation Infrastructure Program
ERDC	Engineer Research and Development Center
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management

Headquarters, IMCOM, centrally manages the inspection and inventory of Army dams under the Army Transportation Infrastructure Program. The Army has 223 dams in the ➤

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The words "renovate" and "rehabilitate" imply that a construction project is being discussed. However, when repairing a failing facility, the addition of a system that did not exist before and is now a requirement to address a LHS condition, like fire prevention or a Disabilities Act requirement, is part of the repair project and does not need to be installed as "construction."

Lessons learned

Experience has taught that there are some facts and figures to watch out for when preparing the restoration and modernization DD 1391:

- Contingency costs are normally 10 percent.
- The supervision and administration cost for FYs 2010 and beyond is 5.6 percent for continental United States installations.
- The facility's category code must match that in the real property inventory. Any category code change must be approved prior to requesting project approval.
- There should be 15 distinct paragraph statements in the additional information section that address the most common questions asked.
- Be concise and to the point in describing the need for the project. The first paragraph in the "Project Description" should tie the project to an Army program or mission.
- Construction start date must be in the future, not the past.

SRM DD 1391 notes

A new twist plays into the process this year because Public Law 111-84 requires additional documentation for projects exceeding the 75 percent Rep/Rpl ratio.

Energy Conservation is a very important issue, and, for the foreseeable future, it is also reportable. The Army must report to Congress yearly on progress it made incorporating Leadership in Energy and Environmental Design requirements in repair projects. The Engineer Research and Development Center's *Energy and Water Conservation Design Guide*, found at *http://www.wbdg.org/pdfs/usace_ewcdr_execsummary.pdf*, provides guidance to use when scoping SRM projects.

All SRM projects for major renovations of existing buildings and all new construction projects, regardless of funding source, shall meet the requirements of the Energy Policy Act of 2005 to reduce energy consumption by 30 percent compared to a facility designed in accordance with American Society of Heating, Refrigerating and Air Conditioning Engineers 90.1-2004. Further, SRM projects for major renovations of existing buildings and all new construction projects, regardless of funding source, shall install advanced utility meters for measuring electric, natural gas, potable water, steam, hot water and chilled water consumption. These costs should be included on the SRM DD 1391.

The procedures to complete an SRM DD 1391 and business rules for project submission are located within Army Knowledge Online at *https://www.us.army.mil/suite/page/623234*, Public Works SRM Management, Work Classification and Project Approvals. You must have an AKO account to access the site. Also found there are examples of memorandums, Rep/Rpl spreadsheets for barracks and other facilities, documents related to the Programming Administration and Execution system used to develop factors for the Plant Replacement Value Analysis Worksheets, and information related to energy and maintenance and repair for Defense facilities.

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inventory, with 49 classified as "high-" or "significant-" hazard dams. Since 1990, nine dams have failed, one of which was a significant-hazard dam.

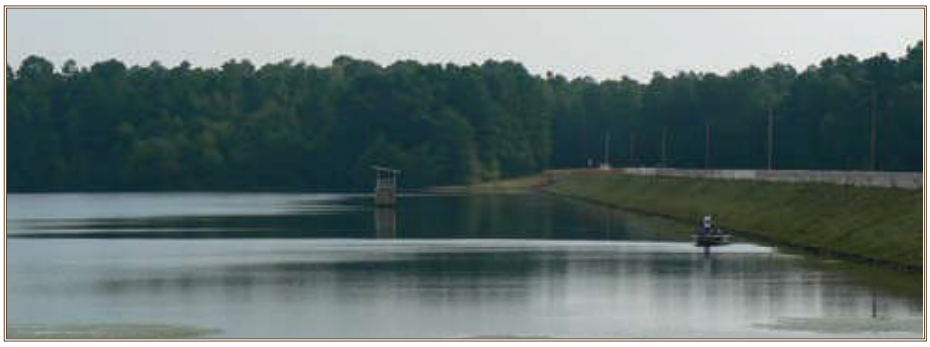
The inventory, inspection, maintenance and repair of dams are governed by public laws, which carry the possibility of severe penalties for those who do not abide by them. In 1992, the assistant chief of engineers sent a memorandum to all Army major commands and installation commanders that stated, "Commanders could be held liable, as operator/owner of a Dam, for any legal claims, obligations or liabilities resulting from the failure of a Dam, especially if the Commander had not ensured that all legal and safety requirements had been met." This statement was based on a legal determination.

As the owners of the dams, garrison commanders are subject to possible personal litigation if it is believed that they broke the law by not managing the dams as required. The garrison commanders could be responsible for obtaining and paying for their own lawyers if litigation is brought against them for violations.

Lack of funds does not relieve the garrison commander of responsibility if the required funds have not been properly requested. The garrison commander must give these areas the highest priority and request funds from the supporting headquarters if funding is not available at the garrison level.

Senior mission commanders set the priorities for projects on installations and could be potentially held liable also. This means that they, too, could be made to personally pay for damages awarded by the court.

The general policy is to manage Army installation dams by periodically assessing their condition, establishing work plans and developing maintenance strategies to make best use of available maintenance funds. The life and health safety of downstream populations is a key consideration in the maintenance of dams.



Garrison commanders are legally responsible for Army dams like the Elliott Lake Dam at Red River Army Depot, Texas. Photo by Tina Holmes, ERDC

The Army Dam Safety Program has four parts – inventory, inspection, emergency action plans, and maintenance and repair.

Inventory

Public law requires all dams to be placed in the National Inventory of Dams along with required technical data on the dams. The inventory is to be updated every two years on the odd fiscal year.

The Army Inventory of Dams, which is a portion of the National Inventory of Dams, is managed and maintained by Headquarters, IMCOM, under the ATIP in coordination with the Engineer Research and Development Center, Vicksburg, Miss.

Inspection

Public law requires all dams to be inspected periodically. How often a dam is inspected is influenced by its hazard category, condition and events that may have damaged the dam.

Dams are categorized as *high-hazard, significant-hazard* or *low-hazard*. High-hazard dams are those that will cause loss of human life in the event of failure. Significant-hazard dams are those with no probable loss of human life but that can cause economic loss or environmental damage in the event of failure.

All dams require annual inspections. More frequent inspections are required for those in poor condition or right after a catastrophic event. High-hazard and significant-hazard dams also require a more formal detailed inspection every five years.

Emergency action plans

All dams must have an emergency action plan, a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life. The plan contains procedures and information to assist the dam owner in issuing early warning and notification messages of the emergency situation to responsible downstream authorities. It also contains inundation maps to show the authorities the critical areas for action in case of an emergency.

High-hazard and significant-hazard dams require a formal emergency action plan as detailed in FEMA 64, *Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners.* The emergency action plans for high-hazard dams and significant-hazard dams are to be reviewed annually and exercised periodically. For low-hazard dams, a standing operation procedure may be substituted as an emergency action plan.

Maintenance and repair

Army dams are to be maintained as specified in appropriate FEMA

Coming to your workplace: Defense Critical Infrastructure Program

by Nathan M. Kathir

If you work for an Army installation or for a U.S. Army Corps of Engineers district, chances are your job will require you to support the Defense Critical Infrastructure Program in the near future, or you've already started to do so. DCIP has existed for 14 years, yet it is still not widely known among Department of Defense installations.

What is DCIP?

The ability of the federal government to accomplish its assigned missions depends on a global array of critical infrastructure. Many government agencies are involved in critical infrastructure protection, and the Department of Homeland Security has the lead.

The 2009 National Infrastructure Protection Plan lists 18 critical infrastructure and key resources sectors, and assigns a cabinet-level agency or department as the lead for each sector. Many other agencies support each sector's lead agency. For example, DHS is the lead for the Dams Sector, and USACE is a supporting agency.

DoD plays two roles in critical infrastructure protection for the nation. First, at the national level, it supports the DHS and is the lead for the Defense Industrial Base Sector. Second, in its departmental role, DoD is responsible for the DCIP.

Nathan M. Kathir
Photo by Pushpa Kathir

The DCIP was established by Executive Order 13010 in 1996, which states that, "Certain national infrastructures are so vital that their incapacity or destruction would have a debilitating impact on the defense or economic security of the United States." It is an integrated risk management program designed to support anti-terrorism and force protection, information assurance, continuity planning and readiness.

There are 10 Defense Infrastructure Sectors assigned to eight DoD agencies and two combatant commanders. USACE is the DCIP defense infrastructure sector lead agent for Public Works. USACE also has a crucial role on other sectors because they all depend on the support of the Public Works Sector for their survivability and continued operations. Within USACE, the DCIP resides in the Programs Branch of Installation Support, Directorate of Military Programs at Headquarters.

Acronyms and Abbreviations	
DCI	defense critical infrastructure
DCIP	Defense Critical Infrastructure Program
DHS	Department of Homeland Security
DoD	Department of Defense
USACE	U.S. Army Corps of Engineers

The DCIP mission is to enhance risk management decision-making capability at all levels to ensure that DCI is available when required. Its vision is to ensure the availability of DCI in all threat and hazard environments. In this context, "threat" refers to manmade events such as those related to terrorism, and "hazard" refers to natural disasters, accidents, aging and lack of maintenance.

DoD missions are owned by combatant commanders. The infrastructure is owned, leased or operated by DoD, other government organizations, the private sector, foreign governments or foreign industry. Many stakeholders are involved, and assuring such a vast array of DCI is a complex process.

The primary responsibilities of the Public Works Sector include:

1) develop, publish and maintain comprehensive DCIP implementation plans;
2) coordinate and integrate activities with other DoD risk management programs and activities;
3) provide, maintain and review critical infrastructure risk-management data;
4) monitor and report DCI-related threat and hazard assessments and changes;
5) annually nominate recommendations to the chairman of the joint chiefs of staff for, and monitor the results of, DCI vulnerability assessments, risk assessments and risk response actions;
6) identify, validate and submit consolidated and prioritized resource requirements;
7) conduct DCIP education, outreach and training activities;
8) assign a flag officer or a Senior ➤

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documents. Deficiencies found on high-hazard and significant-hazard dams that jeopardize their stability are to be repaired or the water behind the dam lowered.

Dams are to be repaired to the host state's criteria. Dams that cannot be repaired should be demolished or replaced. High- or significant-hazard dams that are awaiting repair and are in danger of failure should have the pools lowered.

Training on inspections, emergency action plans, maintenance and repair, and the Army Dam Safety Program can be obtained from ERDC. OACSIM and IMCOM, in coordination with ERDC, are developing training classes for dam safety and inspection. The first training class is scheduled for 2011.

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Ali Achmar is ATIP manager, Headquarters, IMCOM; and Michael Dean is the Army Dam Program manager, OACSIM.

Energy conservation, mold prevention training on free CD

by Dahtzen Chu

A new CD captures materials presented in a training course to help facility managers understand energy conservation mandates and take measures to prevent mold and mildew in buildings. The free CD is available from the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory.

The Energy Policy Act of 2005 requires that newly constructed federal facilities achieve 30 percent better energy consumption than comparable facilities designed in accordance with American Society for Heating, Refrigerating and Air-conditioning Engineers Standard 90.1-2004. The Energy Independence and Security Act of 2007 and Unified Facilities Criteria 3-400 state similar requirements for major retrofit projects.

Combined with this focus on energy conservation is the growing need to remediate and prevent serious, extensive mold and mildew challenges that have been longstanding issues.

To help achieve these goals, U.S. Army Corps of Engineers and Directorate of Public Works staffs require training on the latest developments in both energy conservation and mold prevention.

Building on the success of earlier workshops, USACE and the Installation Management Command jointly funded CERL in 2009 to develop and present a new curriculum on energy conservation and mold and mildew remediation at two workshops in Fayetteville, N.C., and one in Honolulu. A diverse team of subject matter experts developed and presented the workshops.

The CD contains 53 presentations on energy conservation and mold prevention and 22 documents on energy and ➤

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
ERDC	Engineer Research and Development Center
USACE	U.S. Army Corps of Engineers

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Executive Service member as the Defense Infrastructure Sector critical infrastructure assurance officer; and

9) coordinate with non-DoD asset owners to accomplish DCI risk management activities; lead the development of threat or hazard assessments and provide support, as appropriate, for vulnerability assessments of these assets.

This list comprises only part of the Public Works Sector responsibilities. Because many of the other defense sectors rely on the Public Works Sector for their functions and operations, USACE plays a major role within the entire DCIP community.

How can you support DCIP?

The Public Works Sector includes real property inventories, like environment, land, buildings and utilities, that manage the support, generation, production and transport of commodities, such as electric power, oil and natural gas, water and sewer, and emergency services for and to DoD facilities. DCIP must identify and prioritize critical assets, identify threats and hazards, assess the assets for any vulnerability that might exist and be exploited, and mitigate or remediate risks.

This information is how the assets' owners and installations can assist the defense infrastructure sector lead agents and DCIP vulnerability assessment teams. The Public Works Sector needs installation data on utilities, asset location and construction data to perform dependency analysis. Installations can greatly assist by providing the necessary utility and other data in a timely manner when required.

Although basic utility data typically exists in unclassified form, it becomes classified when associated with DCI. The Public Works Sector intends to establish a secure database that can be shared by the DCIP community.

How can you benefit?

Providing information on utilities infrastructure to an assessment team helps the team perform various assigned tasks. Also, doing so greatly enhances the assistance you would normally provide to tenants and complements your other mission assurance tasks such as antiterrorism and continuity planning. DCI assets should be part of your installation's Mission Essential or Vulnerable Areas, and protecting DCI assets assists toward your responsibility to protect all such areas.

After vulnerability assessments are completed, a risk decision package is prepared. Decision makers employ the risk decision packages to select from various courses of action for risk mitigation or risk remediation of critical assets.

After a decision, the options might require a large-scale design or construction effort to support the critical assets and the asset owner. On an Army installation, USACE and Installation Management Command would likely be involved with the Military Construction initiatives that would follow.

Goal

Although the DCIP has been in existence since 1996, the program is still evolving and maturing. The desired end state is that critical assets are identified, vulnerabilities assessed and risks against all threats and hazards are mitigated to an acceptable level. With its talent, USACE is positioned well to support the installations and asset owners to achieve this objective.

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What is facility systems safety, and why do you need it?

by Victor Taylor

Facilities systems safety is not a fad and is not really new. It has been around for ages, deep in the mental recesses of design engineers and architects. Simply stated, the term means including systems safety in the design, construction and alteration of facilities or projects. The basic concept is to construct a building or design a project that includes safety from start to completion and use.

The level of systems safety analysis of the design or project depends on its size and complexity-related hazards. A detailed Failure Modes and Effects Analysis would be overkill for the design and completion of a barracks. But, for a chemical demilitarization plant involving destruction of nerve gas, no analysis is too detailed. Even with barracks, simple systems safety analysis, i.e., barrier analysis or change analysis, is desirable.

We build to code, so why worry? Isn't safety already embedded in design or construction?

Codes are wonderful standardization tools and have improved building design and construction. But it is possible to build to code and still build in unwarranted and unnecessary hazards for building users and maintenance personnel.

Acronyms and Abbreviations	
FASS	Facilities Systems Safety
USACE	U.S. Army Corps of Engineers

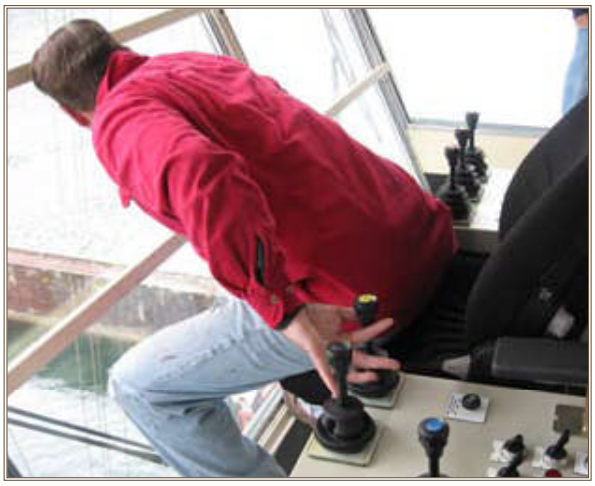
One example of added benefits from using tenets gleaned from systems safety during design is roof construction. The Bureau of Labor Statistics estimated that 121 fatalities resulted from workers falling from roofs in 2008.

Designers could minimize the need for workers to access roof edges during the building life by locating mechanical equipment at ground level or in the center area of the roof. Permanent engineered roof anchors could be designed into the building when work near the edge is unavoidable. Parapets could be higher and could be used as guardrails, if designed and installed per Occupational Safety and Health Administration fall protection requirements.

In another example, a hospital that was built to code and is Leadership in Energy and Environmental Design compliant had inadequate safety review and analysis prior to construction. The lighting in the hospital's common area was very high and not accessible to maintenance workers. When lights began to burn out, the problem was recognized by all.

Because of the narrow entry doors and halls, a special man-lift had to be procured just to change the lights. In addition to the hazards involved with a 92-foot-high reach lift, the redesign and construction of reels to lower the lights are expected to cost $125,000 versus the estimate of $25,000 if they had been designed in and constructed with the building.

Another example of inadequate review is shown by a U.S. Army Corps of Engineers-designed bridge crane. In order to see the lift gates from the bridge crane, the operator was forced to feel for the crane controls while maintaining line of sight with the load. The condition was corrected after the crane was built resulting in additional cost.



A dam crane operator must lean forward and twist in his seat to see the lift gates while groping for the controls, a situation that a systems safety analysis of the design would have spotted. Photo by Dave Stanton, Portland District, USACE

There are lots of additional examples where embedding safety in the design and construction of a facility or project would have saved money and possible injury to employees or occupants. Requirements for project and facility systems safety are listed in Army Regulation 385-10, *Army Safety Program*, Chapter 9; and Department of Army Pamphlet 385-16 *System Safety Management Guide*. Implementation information is included in *Project Management Business Process Manual* – REF8016 G.

The U.S. Army Engineering and Support Center, Huntsville, Ala., is the USACE Directory of Expertise for facility system safety. Huntsville Center is available to help you implement the requirements in the Army standard and pamphlet.

FASS training courses are offered on an as-needed basis for Installation Management Command facility engineers, design engineers, architects, and safety and health professionals. Additional FASS information is available on the Huntsville Center's website, *http://www.hnd.usace.*

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water conservation design requirements for sustainment, restoration and modernization and Military Construction projects.

To receive a copy of the CD, contact Dahtzen Chu, 217-373-6784, dahtzen.chu@usace.army.mil.

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New contract supports ROOFER services acquisition

by David Bailey

The U.S. Army Engineer Research and Development Center awarded a multi-year indefinite–delivery, indefinite-quantity contract that can help installations comply with Army Regulation 420-1, which mandates use of the ROOFER roof management system. The IDIQ is intended to provide installations with a one-stop, easy-to-use vehicle to procure ROOFER services.

ERDC's Construction Engineering Research Laboratory selected three bidders for the contract to ensure their qualifications. The bidders will compete for each project under the IDIQ to ensure best value to the Army.

The ROOFER Sustainment Management System provides installations with inventory, inspection, condition assessment, and network and project analyses to manage roofs and make informed decisions for repair and replacement scheduling. ROOFER uses standard inspection procedures and numerical indexes for assessing condition. Distress data is collected during visual inspections and, for insulated membrane roofs, additional information is provided by nondestructive moisture surveys and gravimetric analyses of core cuts. From this data, ROOFER generates condition indexes for the major roof components and an overall roof condition index rating.

ROOFER's benefits include:

- objective, consistent evaluation of roof conditions;
- systematic, documentable engineering basis for determining needs and priorities;
- cost analysis for selecting repair and replacement alternatives;
- means for rapidly developing annual work plans and long-range budget plans;
- work request documentation for recommended actions; and
- improved roof condition and performance through knowledgeable maintenance and repair decision making.

The IDIQ offers services to establish the roof network inventory and assess conditions using the standardized ROOFER visual inspection procedures. Provisions for conducting aerial infrared moisture scans can be included to determine the insulation condition for insulated membrane roofs. In addition, the contract covers visual inspection services for metal and other roofing types not currently managed in ROOFER. A condition assessment procedure for metal roofing systems is under development and will later be incorporated into ROOFER.

After completing the field work and entering the information into the ROOFER database, the contractor will provide the installation's Directorate of Public Works with access to the database, a presentation on findings and hard copies of management reports. In addition, local personnel will be given a short training session on the ROOFER system and use of the web-based application.

Installations can take advantage of the IDIQ using a direct funds cite, which provides a substantial savings because no government overhead is charged. A small stipend to CERL through a Military Interagency Purchase Request, known as a MIPR, is required for travel to develop task orders and ensure the contractor's work meets requirements.

Typical costs for a first-time implementation of ROOFER run about 10 cents per square foot. For a typical installation with 2.5 million square feet of roofing, the initial launch would be about $250,000. Depending on the size of roof network, it may be advantageous to divide implementation into phases by separating the network into logical groupings, such as building type or geography.

Once ROOFER has been fully implemented, regular re-inspections can be scheduled every three to five years to update the network condition data. With the inventory information already collected, unit costs for re-inspections are about half as much as for first-time implementation. For the same installation with 2.5 million square feet of roofs, to re-inspect one-quarter of the roofs annually would be about $30,000 per year.

ROOFER has been migrated to a web-based application that uses the existing BUILDER platform. The new version is centrally hosted at CERL, with support and development costs provided by the Office of the Assistant Chief of Staff for Installation Management. DPWs ➤

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
DPW	Directorate of Public Works
ERDC	Engineer Research and Development Center
IDIQ	indefinite–delivery, indefinite-quantity

A contractor performs a roof inspections needed to implement ROOFER through an IDIQ contract managed by ERDC-CERL. Photo courtesy of ERDC

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army.mil/safety/FASS.aspx.

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Victor Taylor is the chief, Safety Office, U.S. Army Engineering and Support Center, Huntsville.

PAVER helps installations manage pavement assets

by M.Y. Shahin and William Welborn

Successfully managing pavement assets on military installations includes knowing the pavement inventory, condition of the pavement, and maintenance and repair budget requirements. Army Regulation 420-1 defines the policy for managing pavements as assessing periodically the condition of the pavement network, establishing work plans to reach and maintain predetermined facility conditions, and developing maintenance strategies to make the best use of available maintenance dollars. AR 420-1 also states that the PAVER pavement management system will be used to manage Army pavement and airfields.

The PAVER system was developed and continues to be updated by the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory through funding from the Army, Air Force and Navy. The system consists of tools for defining pavement inventory, determining pavement condition, forecasting condition, optimizing budget spending, identifying budget requirements to meet various management objectives and formulating M&R work plans.

The PAVER inventory methodology has been adopted by the Office of the Secretary of Defense as the Department of Defense guideline for linear segmentation. OSD has also provided funding to enhance PAVER to include all of the fields required to meet the DoD real property accountability business process and data standards.

The distress data for PAVER is collected using a specially equipped vehicle. Photo courtesy of Minnesota Department of Transportation

The PAVER condition tool is based on the Pavement Condition Index, also developed by ERDC-CERL. The PCI is a scale from 0 to 100, with 0 being "failed." The index has been adopted by organizations worldwide, such as NATO, for determining pavement condition. The PCI forms the basis for ASTM International standards D-5340 for airfields and D-6433 for roads and parking lots.

The PCI is determined based on a standard method for identifying pavement distress types, severities and quantities. The pavement distress data can be collected manually or by using an automated distress data collection vehicle.

The vehicle has downward imaging cameras for viewing and interpreting distress and a high-resolution right-of-way camera for viewing surroundings such as traffic signs and pavement markings. The vehicle is also equipped with lasers for measuring road roughness and rutting. All of the gathered data is entered into PAVER for PCI calculation.

AR 420-1 established minimum acceptable pavement service levels based on the PCI. For example, primary roads should not be less than 60 and runways not less than 70. The AR also states that the PCI be used for the installation status report rating and specifies the corresponding PCI ranges for Green, Amber and Red status.

PAVER can also be used to update ISR maps by forecasting the condition at any time in the future with and without M&R. This feature provides the Directorate of Public Works with the consequences of different budget scenarios on future conditions and backlog of M&R. Typical budget scenarios requested by DPWs include: maintain current budget, maintain current condition, reach a target condition in a specified number of years and eliminate M&R backlog over a given period.

The PAVER system has been implemented for all DoD airfields. The Air Force also uses PAVER for the majority of its roads and parking lots. The Army and the Navy use it for roads and parking lots at several installations. Army posts with recent PAVER implementation or PCI re-inspection include Fort Riley, Kan., Fort Campbell, Ky., and Fort McCoy, Wisc.

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Acronyms and Abbreviations

AR	Army Regulation
CERL	Construction Engineering Research Laboratory
DoD	Department of Defense
ISR	installation status report
ERDC	Engineer Research and Development Center
M&R	maintenance and repair
OSD	Office of the Secretary of Defense
PCI	Pavement Condition Index

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should contact CERL to request access to the system. Installations with existing ROOFER data can also have CERL upload this data into the new version.

CERL is also available to provide assistance to installations in developing implementation plans and task orders against the contract.

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David Bailey is senior project manager, CERL.

Fort Polk trial assesses methods to prevent mold regrowth

by L.D. Stephenson and Lake Lattimore

The U.S. Army Engineer Research and Development Center and the Fort Polk, La., Directorate of Public Works are evaluating innovative treatments to permanently remove mold from concrete surfaces. The assessment includes dry-ice blasting with anti-microbial coatings compared to biocidal "eradicants" and protectants.

Mold abatement is a costly, but critical, requirement for Army installations because of mold's potential to affect the health of building occupants and cause lasting damage to the facility. Molds can grow on virtually any substance as long as moisture or water, oxygen and an organic source are present, and they are a persistent problem due to moisture in shower rooms. Mold also often forms around heating ventilation and air conditioning vents due to moisture condensation.

Even with aggressive remediation attempts, it may be impossible to permanently eliminate all mold spores from the treated surfaces, especially for porous materials like concrete. When viable spores are left behind, regrowth becomes a strong possibility, so treatment becomes a recurring cost.

ERDC's Construction Engineering Research Laboratory and Fort Polk are demonstrating the alternative treatment technologies under a project funded by the Office of the Assistant Chief of Staff for Installation Management's Installation Technology Transition Program. The team selected two barracks buildings that had mold and could easily be divided into comparable sections allowing direct comparison of the mold remediation techniques.

Blasting surfaces with dry ice

Dry-ice blasting is an emerging technology for abatement of large areas of mold contamination on some types of surfaces. It requires temporary containments to prevent the mold from spreading to other areas during the remediation process.

The technology uses dry ice pellets that are propelled at supersonic speeds toward their target. The pellets' high kinetic energy breaks up the mold colonies and causes the remnants to fall off the wall or ceiling, after which the debris is removed. The dry ice then undergoes a phase transformation to carbon dioxide gas. The CO2 is absorbed by the atmosphere, which avoids wetting of the walls.

At Fort Polk, dry-ice blasting by itself was found to leave small mold stains, most likely remnants of the mold — rhizomes or hyphae — that had dug into the surface at locations where the mold had been present. The walls were washed down with a commercially available mildewcide to rid the surfaces of residual fungi prior to repainting.

To judge the treatment's efficacy, inside-to-outside airborne spore count ratios before and after dry-ice blasting treatment on concrete masonry were determined. The ratios were dramatically reduced by remediation — in one case from 119.7 to 1.3. For all surfaces, the mold spore counts on all walls were reduced by factors of 1,000 to 100,000.

As a final step, anti-microbial coatings were applied by rolling or spraying the treated surfaces to prevent mold re-infestation. Four anti-microbial products were evaluated previously in the laboratory using ASTM International D-5590, which determines how well mold grows under controlled temperature and humidity conditions. Two protectants had no mold growth after six weeks in this accelerated test, and the same products had very little mold growth after six months in the field tests.

Eradicant biocides, protectants

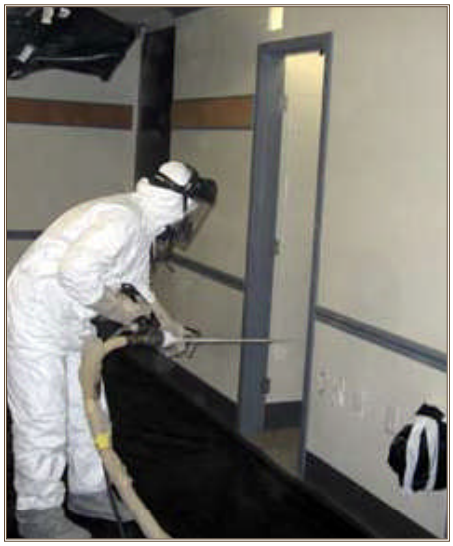
The CERL-Fort Polk team is also evaluating a two-step mold removal process that involves application of biocidal eradicants to remove mold, followed by application of biocidal protectants to prevent recurrence. This process will not harm painted surfaces. The three biocides selected, which have potential to kill a broad range of molds, are hydrogen peroxide, diethylene glycol monobutyl ether/tetrasodium ethylenediamine, and quaternary ammonium chloride compounds.

Since dry-ice blasting is limited to more durable surfaces such as concrete masonry units, tile, cement and wood studs, the biocide eradicants are expected to have more potential for mold removal on a broader range of surfaces, without the need for repainting. In addition, no specialized equipment is required to apply them.

Following mold remediation with the eradicants, the team applied the three most successful protectant formulations used after the dry-ice blasting.

Both mold abatement demonstrations will be monitored for another year to see if the eradicant biocides are as effective at removing mold as the dry-ice blasting ➤

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
ERDC	Engineer Research and Development Center



Appropriately suited, a worker blasts mold off walls using dry ice pellets as part of a mold abatement test at Fort Polk. Photo courtesy of ERDC

Sustainable metal roof for Pacific Rim facilities in testing

by Roch Ducey, Dave Bailey and Roger Panzer

Corrosion-resistant roofs with integrated photovoltaic cells take advantage of two emerging technologies that provide both sustainable roofs and affordable electric power. Industry has developed innovative thin-film solar cell appliqués that can be installed on zinc-aluminum standing seam roof panels, which already have high performance anti-corrosion coatings applied, resulting in excellent corrosion protection characteristics.

Together, the two technologies further enhance the noncorrosive properties of the metal roof system, while providing electrical power to the utility grid, helping to offset facility energy costs.

This concept is being demonstrated on a replacement roof at Kilauea Military Camp, Hawaii. The demonstration is a partnership between the Construction Engineering Research Laboratory and the KMC Directorate of Public Works.

Located on the Big Island within Hawaii Volcanoes National Park, KMC is subject to a very harsh marine environment and highly corrosive gases from the nearby Kilauea Caldera. These operating conditions provide a worst-case scenario for testing the roof's structural integrity. In addition, electric rates in the Hawaiian Islands are among the highest in the nation, exceeding the cost of solar-generated electricity.

The roof was installed in early 2010. A ground-mounted test array, which was instrumented with corrosion detection sensors, was also installed. Corrosion monitoring has been ongoing since the replacement.

The 15-kilowatt peak solar power system was completed in late April and a post-construction meeting was held with Hawaiian Electric Company representatives to discuss the requirements for connecting the system to its grid. Interconnection of the solar power system is planned for early fall, when a one-year performance monitoring period will begin.

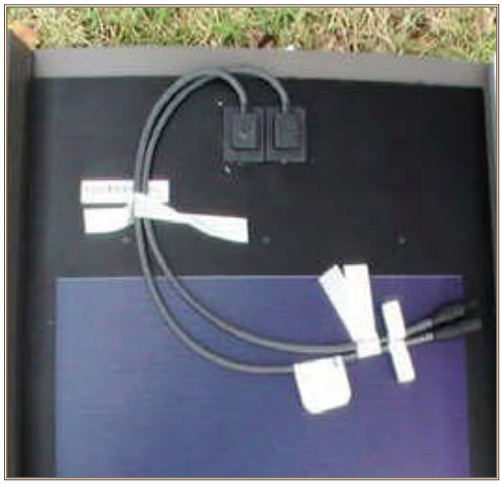
Projected benefits

The proof-of-concept demonstration at KMC will validate the projected benefits of these integrated technologies, i.e., enhanced survivability in corrosive marine environments while producing electricity at lower costs than the high local utility rates. To one degree or another, these are the operational conditions experienced at most Department of Defense Pacific Rim facilities.

In accordance with Office of Management and Budget Circular A-94 and using the required spreadsheet, a return on investment of 18.5 percent was calculated for the project. The associated savings were $12,706,000. This return on investment was based on current best practices as well as projected maintenance and rehabilitation practices and costs.

A somewhat intangible benefit of this system is that a high percentage of DoD facilities in the Pacific Rim use their roofs as water catchment systems for the cost-effective, green production of potable water. In this situation, the roof would serve three functions: a long-lasting, corrosion-resistant shelter for the building; an on-site power source that helps reduce utility costs and improve energy security; and the source for producing potable water.

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
DoD	Department of Defense
DPW	Directorate of Public Works
KMC	Kilauea Military Camp



Each thin-film, self-adhering solar power module is installed on its associated metal roof panel, with the wiring interconnects located at the ridge end of the panel. Photos courtesy of ERDC-CERL

Workers then install the combined unit on the roof joists.

Proposed efforts

This system-of-systems integration project required applying at the construction site a commercial-off-the-shelf thin-film solar product to the standing seam metal roof with anti-corrosion coatings. Though this two-step construction approach is likely to prove successful in supplying a cost-effective, durable, multi-functional roofing

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and biocide. Detailed results with data will be available in an ERDC technical report.

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Transportation Systems Center: One stop for world-class expertise

by Terry Sherman

The U.S. Army Corps of Engineers' Transportation Systems Center provides a unique one-stop service for transportation systems planning, design and construction. Customers around the world can call upon the TSC at any time for the technical services described below.

Airfield engineering – The TSC provides recommendations for maintenance and repair of existing airfield pavements. It provides airfield obstruction survey mitigation and assists in preparing waivers to airfield engineering criteria. It also provides airfield suitability studies for siting new runways or extending existing runways.

Roadway and railroad engineering – The TSC provides recommendations for maintenance and repair of existing roadway pavements and railroads. Services include on-site or telephonic consulting services, value engineering studies, railroad track inspections and planning assistance for new construction. .

Design reviews – The TSC reviews airfield, roadway and railroad design projects. It also reviews job order contracts, aids in compliance with Department of Defense Engineering Criteria and Safety Standards, fulfilling requirement for Army Regulation 95-2, and reviews DD Form 1391s.

According to the regulation, TSC reviews are mandatory for all real property facility designs for the maintenance, repair or construction of any item related to Army aircraft operational facilities. For USACE, TSC reviews are mandatory for all airfield and railroad project designs, regardless of funding type, and all projects, regardless of funding type, where the roadway portion is more than $3 million.

Terry Sherman of the TSC discusses quality control with quality assurance representatives at Kandahar Air Base, Afghanistan. Photo by Patricia Ryan, Afghanistan Engineer District South

Construction support – The TSC provides a wide variety of construction support services including:

- architectural-engineering on-site construction support;
- technical review of shop drawing submittals and hot mix asphalt or Portland cement concrete mix design submittals;
- preparatory inspections;
- PCC or HMA plant inspections;
- PCC or HMA test sections;
- concrete uniformity testing;
- troubleshooting of paving problems during construction;
- PCC mix design review and adjustment;
- HMA job mix formula review and adjustment;
- on-the-job training for quality assurance personnel;
- joint sawing and sealing operations; and
- on-site airfield paving workshops on how to construct quality HMA and PCC airfield pavements.

The workshops are provided for USACE QA staff, contractor and subcontractor quality control and construction staff, ➤

Acronyms and Abbreviations	
A-E	architectural-engineering
ERDC	Engineer Research and Development Center
HMA	hot mix asphalt
PCASE	Pavement-Transportation Computer Assisted Structural Engineering software
PCC	Portland cement concrete
QA	quality assurance
QC	quality control
TSC	Transportation Systems Center
USACE	U.S. Army Corps of Engineers

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system, the development of a process that integrates the two technologies at the manufacturing plant would greatly lower both initial capital costs and life-cycle costs.

It is estimated that a one-step manufacturing process would improve the economic factors by as much as 25 percent, making them even more attractive for widespread implementation at DoD facilities throughout the Pacific Rim. Ultimately, these systems may become economically viable for mainland facilities, as well.

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Fort Bliss hosts energy rodeo to stimulate conservation ideas

by Stephen Baack

Fort Bliss, Texas, held a Renewable Energy Rodeo and Symposium in June. The rodeo presented a variety of energy technology demonstrations, several discussion panels and dozens of exhibitors. The event left in its wake the ideas, tools and innovations to make the installation the Army's center for renewable energy.

The rodeo idea was developed by Fort Bliss commanding general, Maj. Gen. Howard B. Bromberg, and Grace Bochenek, director of U.S. Army Tank Automotive Research, Development and Engineering Center, which co-hosted. They came up with an event to bring attention to a critical need for armed forces of the future.

Eighteen months ago, the Department of Defense and the Army's staff for Installations and the Environment conducted an analysis of Fort Bliss' renewable energy potential. The analysis showed that the region has the potential for geothermal, wind, solar and biomass.

Fort Bliss has already started operating differently since the rodeo. Four Fort Bliss houses in which Soldiers and families are living went off the grid through the use of solar power.

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materials suppliers and testing personnel. USACE designers, local Air Force Base civil engineers and Directorate of Public Works staff members are also invited to attend. USACE policy requires airfield paving workshops for its personnel involved in airfield projects of more than $5 million.

The workshops are tailored to specific project requirements. They usually last one day for HMA paving and two days for PCC slipform paving.

HMA workshops include an overview of HMA, mixing plant operations, placement, compaction, materials testing, QC and QA testing and inspection, control charts, troubleshooting and a review of contract specifications. PCC workshops include mixing plant operations, materials testing, QC and QA testing and inspection, slipform paving, finishing, texturing, curing, grooving, joints, joint sealing, demolition and review of contract specifications.

A-E indefinite delivery contracts – The TSC provides A-E fixed-price indefinite-delivery type contracts for:

- airfield and roadway design and evaluation;
- railroad and roadway design and evaluation;
- airfield obstruction surveys;
- construction management for airfields; and
- pavement engineering management system implementation for airfields and roadways.

These contracts can be accessed through any USACE district or research laboratory.

Pavement-Transportation Computer Assisted Structural Engineering software – With just a click of the mouse, help is on its way for pavement and railroad engineers. For designers, PCASE helps determine pavement thicknesses for both airfields and roadways, using many different scenarios, in minutes. For evaluators, there is equipment support and analysis.

Software is available that can interpret nondestructive test data for use in pavement designs and evaluations. Analysis software is available that can determine pavement life, classification numbers and allowable loads. The software was developed by USACE's Engineer Research and Development Center and is managed by the TSC. PCASE is available at *www.pcase.com* or *https://transportation.wes.army.mil/pcase*.

Tri-Service Transportation Systems Workshop – Every four years, the TSC — along with the Navy; Air Force; Headquarters, USACE; and ERDC — plans and participates in the Tri-Service Transportation Systems Workshop. Engineers from around the world speak at and participate in the workshop.

The workshop has been hugely successful in building bonds and solutions for the transportation systems community. Plans are underway for the next workshop in 2012. For information, visit the website *www.tsworkshop.net*.

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Revisiting the past gives IMCOM its future home

by Brian Dwyer

The 2005 Base Realignment and Closure requirement to relocate Headquarters, Installation Management Command, from Arlington, Va., to Fort Sam Houston, Texas, will not only involve a move across the country but also a trip back in time. To accommodate the more than 1,500 military and civilian positions associated with IMCOM and its subordinate components, five historic structures are being renovated to go along with the construction of two new buildings.

The projects total $150 million and will collocate several elements of IMCOM, reducing certain overhead expenses and creating a new level of consolidation and operational efficiency when the facilities are finished in 2011. IMCOM headquarters and its subcommands — Family and Morale, Welfare and Recreation Command and Army Environmental Command — will all relocate to Fort Sam Houston.

The arrival of these commands will complement earlier realignments mandated by BRAC law that took place on the post in 2006. At that time, IMCOM's Northwest Region offices moved from Rock Island Arsenal, Ill., and merged with IMCOM's Southwest Region offices on Fort Sam Houston to form a single West Region headquarters.

Headquarters, IMCOM, oversees all facets of managing Army installations around the world, including maintenance of the roads, grounds and lighting; new construction; barracks and family housing; food management; environmental programs; Soldier and family morale, welfare and recreation programs; logistics; and installation funding.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
IMCOM	Installation Management Command
FMWRC	Family and Morale, Welfare and Recreation Command

Moving forward by looking back

One of the chief advantages of the cross-country move is anticipated cost savings. IMCOM's headquarters is currently in leased space in the Washington, D.C., area, which, historically, has been more expensive to occupy than government-owned buildings.

On Fort Sam Houston, IMCOM will use a campus of three-story, historic structures arranged in a square. These buildings were built as infantry regimental headquarters and an infantry barracks between 1928 and 1929.

In the middle of these facilities, a new 168,000-square-foot headquarters building will be constructed. This structure will reflect the Spanish motif of the surrounding buildings, with features such as a red tile roof, but will not replicate their exteriors to avoid any suggestion that it is also a historic building.

Across the street, a new 28,000-square-foot instructional facility for FMWRC will be built. The development of the campus will also include constructing new roads and extending, widening and replacing certain existing roads to facilitate traffic flow.

Not far from the IMCOM headquarters building, the historic Fort Sam Houston Theater is being renovated and expanded to support the realignment. The facility opened in 1935 as one of the first dedicated movie theaters built by the Army in the United States. It will become the new home of the FMWRC's Army Entertainment Division, which is relocating to Fort Sam Houston from Fort Belvoir, Va.

This division stages a touring musical production called the U.S. Army Soldier Show, featuring active duty Soldiers who are selected by audition from throughout the Army. The renovated 14,700-square-foot theater will serve as the rehearsal hall for the cast of the annual production, while a 26,000-square-foot addition will provide theater support facilities, office space, recording studios and equipment storage.

The project will alter the building's original movie-theater configuration to accommodate theatrical productions. The work will extend the existing stage and modify the rear portion of the building to incorporate the 80-foot-tall fly tower necessary to raise and lower stage sets. The balcony seating will be removed ➤

Three of the four historic buildings in this grouping are being renovated to provide additional space for IMCOM, and IMCOM's headquarters building will be constructed in the middle. The post theater (upper left) is also being renovated. Photos courtesy of U.S. Army Corps of Engineers

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to make room for lighting and sound equipment, reducing the theater's seating capacity from 1,100 to 800.

Many elements of the theater's Spanish Colonial Revival style architecture will be retained as part of the renovation project. The theater has a white, stucco exterior, arched entryways and a bell tower reminiscent of the 18th century Spanish missions in San Antonio. Among other features that are expected to be retained are original light fixtures, wooden banisters, exterior lamp posts, the heavy wooden front doors, painted wooden ceiling beams, frescoes and wall murals, and the original ticket booth at the entrance.

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

Building 2265 is one of the historic structures that are being renovated to accommodate IMCOM.

Beyond BRAC

The BRAC projects that are making way for IMCOM's headquarters are not the only substantial historic renovation projects on Fort Sam Houston. A non-BRAC-funded project has allowed IMCOM's West Region headquarters to move across the post into a refurbished building that was built in 1908 to serve as the installation's hospital.

The building is a three-story wood and masonry structure with a basement and an attic. It has limestone exterior walls, wooden and masonry columns, wraparound wooden verandas on the first and second floors, and a wood-framed roof structure. This facility is a prime example of the huge inventory of historic structures on the installation. Construction of the post began in 1876, and today, it has about 800 historic structures, which is more than any other active military installation in the United States.

The historic structures involved in BRAC and associated projects require extensive rehabilitation to become suitable for their new tenants. In most cases, existing interior partitions, electrical wiring, plumbing, climate control systems, and interior and exterior lighting fixtures need to be replaced. Stairways, ceilings, wooden floors, structural roof members, interior and exterior doors, and windows are also being repaired, refinished or replaced.

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

Transition time

As IMCOM awaits completion of its new home, the process of shifting operations to San Antonio has already begun. An advance team of more than 500 employees established Headquarters, IMCOM, Forward in a building several miles outside of Fort Sam Houston that formerly housed a department store.

Making this temporary relocation possible required installation of furniture and a telecommunications system. This arrangement will make the final transfer from Virginia to Fort Sam Houston much easier when the IMCOM campus is complete.

IMCOM's changes are coming against a backdrop of transition across all of Fort Sam Houston. The 2005 BRAC law that dictated IMCOM's realignment is also bringing several medical and research missions to the post, necessitating construction of many new facilities. The most prominent projects include the expansion and renovation of Brooke Army Medical Center and the creation of a campus to consolidate the enlisted medical training programs of all service branches.

The BRAC and BRAC-related construction on the installation amounts to about $2.3 billion dollars. At the peak of construction, about 65 percent of the post was fenced for either renovation or construction projects.

Many of the facilities are being completed and turned over for use in 2010, setting the stage for a final push toward the completion of all BRAC construction on Fort Sam Houston by September 2011.

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Fort Belvoir: key elements of infrastructure permitting success

by John D. Pitts

For many years, the 800-acre Engineer Proving Ground at Fort Belvoir, Va., supported Army training and testing. You name it, it was probably blown up, bulldozed or set on fire at the proving ground. But, thanks to Base Realignment and Closure 2005, the former testing area, also known as Belvoir North Area, will soon proudly host a major Department of Defense tenant: the National Geospatial-Intelligence Agency.

The new campus for 8,500 NGA employees is a technological marvel, but the infrastructure supporting it is equally vital to NGA's mission. The infrastructure at BNA includes all roads and utilities to support the new 2.2 million-square-foot main building and related campus improvements. It also accommodates future development of BNA's remaining undeveloped areas.

A need for extensive involvement by multiple federal, state and local permitting agencies made executing the BNA infrastructure work program particularly challenging. Delay in obtaining these permits risked delay to the facility and the mission.

How did NGA, the contractor, the garrison Directorate of Public Works and the Army Corps of Engineers successfully manage the risks of permitting for this vital infrastructure program? A number of factors contributed to that success, but two elements were key:

- achieving an early consensus on permitting strategy with each permitting agency; and
- involving the broader project team in the permitting process.

Example: Joint permit application

A consensus strategy and broad team involvement won timely approval of the project's joint permit application, which consolidated state and federal applications to allow activities that would affect wetlands and waters of the United States. The DPW took the lead on submitting the JPA.

Because the NGA project was using a fast-track acquisition process, design would not be complete before some construction was to begin. This situation meant that a final definition of impacts prior to the start of construction was impossible. Since full definition of the impacts is typically required for permit approval, a different strategy was needed.

DPW and its consultant, Wetland Studies and Solutions Inc., established a consensus process with the regulators. Together, they agreed that regulators would approve the JPA initially based on impact estimates, with the understanding that the permit application would be updated and subjected to additional review as the design matured and construction progressed.

Involving the broader project team — including NGA, USACE, design consultants and contractors — in developing this strategy and in drafting the application had important benefits:

- Early contractor involvement helped accurately estimate the character and extent of impacts.
- Close involvement by NGA assured that the ultimate user understood and could live with permit conditions from a mission standpoint.

Acronyms and Abbreviations	
BNA	Belvoir North Area
BRAC	Base Realignment and Closure
DPW	Directorate of Public Works
JPA	joint permit application
NGA	National Geospatial-Intelligence Agency
USACE	U.S. Army Corps of Engineers
VDOT	Virginia Department of Transportation

Work on the JPA began in May 2007, and the agencies approved it in October 2007, less than six months later — warp speed for a major environmental permit.

The initial JPA permitted 2.41 acres of permanent and temporary wetland impacts and 6,153 stream conditional units. A "stream conditional unit" is a measure of impact to "waters of the United States" that takes into account the environmental value of the specific stream that is ➤

A single joint permit agreement covers road and storm-water management construction. Photos by Marc Barnes, U.S. Army Corps of Engineers

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affected.

Since winning JPA approval, the project team has updated the JPA six times to reflect continued avoidance and minimization of impacts. Net wetland impacts were reduced to 2.07 acres, and stream conditional units were reduced to 4,571. While the initial plan anticipated up to 10 permit modifications, only one more modification is anticipated at the end of construction, for a total of seven. This revision will likely "give back" additional impacts held in reserve until as-built conditions are documented.

The NGA Main Office Building goes up amid BNA infrastructure construction.

Example: VDOT right-of-way permits

A similar strategy brought success with permits from the Virginia Department of Transportation. The project needed 22 VDOT permit actions. These included temporary construction access permits, utility improvement permits within the state right-of-way and limited access right-of-way, and permits for other project partners, including Washington Gas and Dominion Virginia Power.

With more than 2,600 workers on site at construction peak, both interim and ultimate access were critical. To complicate matters further, a VDOT "megaproject," the Fairfax County Parkway, was being constructed simultaneously adjacent to BNA.

Because of the extent and complexity of regional transportation improvements for BRAC 2005, VDOT appointed a BRAC project coordinator. The project team approached the coordinator early in the planning stage to foster an understanding of required improvements and to establish close coordination between projects needed to support development of BNA.

The team shared its planning with VDOT early and often, and it found VDOT willing to collaborate on an overall strategy that met both the team's needs and the permit requirements. For example, when the ultimate access improvements could not be completed up front, VDOT allowed phased improvements with later access improvements to be made as needed.

By involving all parties in the access discussion, the team benefitted from better, timelier decisions. This involvement was essential to the free flow of workers and materials to the site and meeting the congressionally mandated BRAC deadline.

Lessons learned

When you are losing sleep over your next project's permitting risks, remember that your greatest ally may very well be the permitting agency itself. Building an early consensus with that agency on your approach to the permit application can be invaluable.

Involving key project stakeholders is another great tactic for mitigating permitting risk. By considering their input at each stage, answers will be found that win the permit while advancing the mission.

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A contractor performs a precision survey for infrastructure planning for the high-tech campus.

BRAC infrastructure features at Belvoir North Area

- 9.16 lane miles of roadway, including two-lane access roads and four-lane divided collector roads
- three bridges — two cantilevered steel bridges and one arch structure
- 4,496 linear feet of water main, from 8-inch service mains to an 18-inch transmission type main
- 1,658 linear feet of sanitary sewer main and associated metering devices
- 14,436 linear feet of storm sewer
- 7,751 linear feet of underground telecommunications ductbank
- 6,847 linear feet of underground electrical ductbank
- 4,590 linear feet of gas main and a pressure reducing station
- seven storm-water management facilities
- electric power substation

Grafenwoehr team brings in $1 billion program on time, on budget

by Rachel Goodspeed

It was the U.S. Army's biggest construction project in Europe since the 1950s, and it was delivered on scope, on time and, most importantly, on budget. For the U.S. Army Corps of Engineers, Efficient Basing Grafenwoehr was not business as usual. The U.S. Army Europe initiative to consolidate command and control headquarters and six battalion-sized elements consisted of more than 150 projects valued at close to $1 billion with the Europe District managing about $100 million each year since 2001.

Bringing this massive construction program to fruition required innovative approaches to organization and acquisition, said Col. John Kem, USACE Europe District commander, during the EB-G Transition Ceremony April 28.

Because the projects were in Germany, U.S. engineers had to follow a U.S.-German agreement to work through Bauämter, the German state construction offices. That extra layer of bureaucracy could have slowed down these critical projects, said Peter Barth, USACE's EB-G regional program manager, were it not for a unique solution — to develop a *baudeinstelle*, or construction service location, where highly-qualified professionals from USACE, the Grafenwoehr garrison and the Bauämter would dedicate their time to the Grafenwoehr program.

The *baudeinstelle* shortened lines of communication, Barth said. Rather than waiting for e-mails or playing phone tag, group members could literally walk down the hall to deliver a message.

"We made the communication process more efficient just by utilizing face-to-face meetings and verbal communication," Barth said. "We had open communication with the garrison and with the Bauämter, and we identified problems very early so we could come up with the right ways to compensate."

The team also provided continuity uncommon within many military construction projects.

"On the U.S. side, we are challenged with the rotation of people every few years," Barth said. "Programming began in 2000, and construction began in 2002 — that's 10 years for this program. We had to take the approach of keeping people as long as possible."

In addition, rather than approaching the EB-G effort as individual projects, the team looked at the effort as a whole program.

"We needed to know what the impact of one project would be on another if it was not constructed, and what the impact would be to the garrison if we completed one facility that cut off access to the construction site of another facility," Barth said. "When you see it as a program, you see the benefits and impacts of each project to the next."

By taking this program perspective, the team could discern what utilities were needed to support all the new facilities and in what sequence infrastructure needed to be constructed. Traffic issues, earth management, site accessibility and contractor access to the post all needed to be considered on the whole.

Acronyms and Abbreviations	
EB-G	Efficient Basing Grafenwoehr
USACE	U.S. Army Corps of Engineers

"For instance, with more than 150 projects, we had a lot of cut and fill going on. We would reuse material created by one project as fill material for the next project," Barth said.

Soil management provided a unique challenge. Grafenwoehr's training area had been a German military site during World War II until it was bombed.

"We had to do a significant cleanup of the site — oil spills, waste from the war and even an anti-aircraft gun buried in the ground," Barth said. "The challenge here is that we really had to include host nation federal agencies like the water protection board. They were very concerned about limiting contaminations, coordinating cleanup and the use of partially-contaminated material."

In spite of the environmental concerns, the EB-G team came up with a plan to reuse crushed asphalt and concrete ➤

EB-G is a U.S. Army Europe initiative comprising more than 150 projects, valued at close to $1 billion, designed and built over roughly 10 years. Photos by Rachel Goodspeed

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rather than disposing of it in a landfill and purchasing gravel, which saved roughly $1.5 million.

Keeping the project on budget and on schedule was one of the most challenging aspects, according to Barth. Despite the holistic approach, the team still had to piecemeal the program into $2 million to $20 million bite-sized projects that allowed multiple local contractors to participate — an approach that differs from similar stateside projects and could have caused delays.

One contractor would have meant fewer layers, fewer schedules to coordinate and fewer projects, Barth pointed out, but the piecemeal approach had an extra benefit.

New motor pools are among the EB-G construction projects.

The Netzaberg Housing Area is one of the EB-G projects.

"Breaking down the program to individual projects benefited the local industry, which helped garner public support from the German community," he said.

Another cause for potential delays was the German weather. With budgets approved in mid-October, contracts could not be awarded right away due to harsh winter conditions.

"It was a permanent struggle to deliver the projects on time," Barth said.

Some projects had to be split into parts that could be worked immediately and parts that were weather-dependent. The team worked to develop contracting and solicitation methods that shortened the time the Bauämter needed for an award. It developed an interactive process. As the Bauämter worked on its bid package, USACE personnel worked in parallel on their award package. Discussions kept everyone in tune with the bid process and funding needs.

Another time-saving technique was the decision to use U.S. companies to design the larger projects that required an understanding of U.S. administrative processes.

"We pulled in U.S. design companies for the schools, for example, because they had an excellent understanding about what our school needs would be," Barth said. "So the U.S. company came up with the basic design and got together with the German company to convert that design into German specifications."

Finally, the push to use or adapt available U.S. military design standards played a critical part in keeping the program on time and on budget.

"Even though the German architects have a tendency to bring in a little of their design culture, we really were sticking to the plan in making repetitive designs and constructed 12 similar barracks buildings or six similar-looking vehicle maintenance shops," Barth said.

At the same time, the team added efficiency features to make the facilities greener and easier to maintain.

"We have to meet host nation standards in terms of energy conservation, which are pretty high, so a lot of the facilities are very efficient in terms of reusable energy and even in terms of using local construction materials so we didn't have to import it from all over the world," Barth said.

In total, EB-G provided the facilities to change the former 1,000-Soldier garrison into an installation that could support more than 3,500 Soldiers and more than 5,000 family members.

Projects included the Netzaberg Housing Area with 830 three- and four-bedroom units; a shopping center with a 250-seat food court, post exchange, commissary and concessions mall; troop billet buildings, company buildings and motor pools; a physical fitness center with a running track and multi-purpose field; upgraded medical facilities; and a modern dining facility.

"It is an understatement to say it was a lot of work," Kem said at the ceremony. "But somehow our engineers, architects and master planners made it look easy."

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At Fort Campbell, team turns around potential costly delay

by Jenn Domashevich

The discovery of an undocumented dump site put a high-profile U.S. Army Corps of Engineers, Louisville District, project at Fort Campbell, Ky., on hold in late January. Thanks to innovative use of a geophysical device, construction site preparation resumed May 3 — 30 days earlier than expected — at half the projected remediation cost.

During site preparations to construct a battalion headquarters and multiple company operations centers on Fort Campbell, waste was discovered below the surface. The waste was determined to be primarily construction-related material, but the site had to be remediated because Kentucky state law forbids stockpiling trash in an area that is not an approved landfill.

"We wanted to start as quickly as we could, because when [the Louisville District's Construction Division] suspended construction, it cost $5,000 per day, and they estimated 90 days of downtime," said Glen Beckham, Louisville District project manager.

The initial idea was to dig a series of test trenches using a backhoe to identify the extent of the problem. But Construction Division expressed concerns about digging in the area, Beckham said.

During a meeting, the question arose whether there was a way to use a geophysical device to identify the waste area. Geophysical devices detect magnetic anomalies and are normally used to locate buried munitions.

"I said I've never been involved with a project where they have done that, but maybe so," said Beckham.

He contacted a geophysicist at the Corps' Fort Worth District. Along with team members from Louisville District's Environmental Engineering and Construction divisions, Army Environmental Command, Fort Campbell's Directorate of Public Works and on-site construction managers, they investigated the idea.

First, they looked at using a ground-penetrating radar that measures soil densities.

"But it was identified that clay acts as a barrier to the radar and is not effective," said Beckham. "This area is known to have clay in the soil, so a better device was identified called an EM61."

An EM-61 pulled behind an all-terrain vehicle is used during the geophysical investigation at Fort Campbell. Photo by Eric Cheng, Louisville District, U.S. Army Corps of Engineers

The EM61 measures magnetic anomalies and soil density disturbances, is not affected by clay and can be geo-referenced to centimeter accuracy.

The project was expected to take 10 days for the geophysical investigation and five days for verification. Verification would be done by digging a limited number of test trenches to confirm the geophysical results. The team wanted even faster results.

"We set some aggressive goals to do the geophysical in five days and do the trenching in two days," said Beckham. "We were in the field three days after the contract was awarded, which was very fast."

It took about a month to assess the site conditions, award the contract and get out into the field. The contract was awarded to Battelle of Oak Ridge, Tenn., a subcontractor of GeoConsultants LLC.

"These guys came out and knew just what they were doing," said Beckham. "They hit the ground running. They used an ATV [all-terrain vehicle] to pull this device over 100 percent of the area, and they basically did it all in one day."

After the geophysical investigation, it was determined that the main building design was sitting right on top of the dump site, which was actually three times larger than first suspected.

"Instead of being 30,000 cubic yards and costing $3 million in remediation costs, it was 90,000 cubic yards and $9 million," Beckham said.

Designers decided the best approach would be to shift the structure 185 feet southeast to an area away from the dump site. The relocation avoided a $9 million remediation, and the remaining remediation cost was estimated to be $550,000 or less, Beckham said.

"We think the remediation time will require less than two months, which is less time than we originally thought, and because of the locations, we can remediate them concurrently with construction, so that's going to save time and money," he said.

The EM61's effectiveness for this geophysical investigation prompted discussions of its potential use as a standard practice.

"Aside from the cost-savings," Beckham said. "I think the other great success was the value of the collaboration on it and the way we worked so well with the Army Environmental Command, with Fort Campbell staff and with the Corps of Engineers staff to quickly reach a solution."

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Europe's access control point upgrades popular, successful

by Scott Farrow

The U.S. Army Engineering and Support Center, Huntsville's Access Control Point Program is only two-thirds complete in Europe and, already, faster secured access to the upgraded installations is proving the program successful.

However, delivery truck drivers and daily commuters aren't the only people happy with the improvements at more than a hundred installation gates in Europe. Also pleased is Edward Wells, physical security specialist and director of emergency services, U.S. Army Garrison Hohenfels, Germany.

The security improvements designed to increase the protection of assets and personnel throughout U.S. Army Europe are impressive, he said. The upgrades also reduce the costs of manning the gates.

The Hohenfels ACP project will result in annual cost savings of about $635,000, Wells said. Future upgrades will add another $400,000 in savings.

Wells was even more impressed with how attentive Huntsville Center and USACE's Europe District engineers were in meeting his installation's specific needs.

"They allowed us to provide the direction on how we wanted the ACP to be designed and to provide the most functionality for the garrison mission," Wells said. "As a result, we have achieved improved functionality, increased security and provided greater safety from the gate we had [prior to the ACP upgrades]."

It's easy for the engineers who designed and implemented the upgrades and people working in the security career field to see the improvements, but the greatest proof comes from the comments made by people using the ACPs.

"I have heard from the guards that the people using the new ACPs can't believe how much faster it seems they can process vehicles through [the gates]," Wells said. Those improvements were long overdue, and I know they appreciate everything that was done."

Acronyms and Abbreviations	
ACP	access control point
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison

Workers install a new guard booth at Grafenwoehr Army Airfield, Germany, part of the ACP upgrades in Europe. Photo courtesy of Huntsville Center

Successful solutions are a combination of the critical information exchange between Corps ACP representatives and force protection officers, who must live with the solution, said Bill Samples, USACE Europe District ACP project manager. Because installations in Europe are usually embedded within a community, they almost never have the real estate available for increasing search areas and installing facilities required to process visitors through the gates, he explained.

"Here, and at many other installations, the force protection solutions require careful analysis and equipment placement," Samples said.

A perfect example, according to Samples, is NATO Support Activity Brussels, Belgium. It is a small installation with multiple ACPs, a main thoroughfare on one side of the installation and a residential street on the other.

"In Europe, solutions must often be innovative to provide the compliant level of protection, to facilitate safe travel in and out of the facility, and to meet the very stringent requirements of the customer regarding the use of their funds," Samples said. "Additionally, host nation requirements must be met, and they vary from country to country."

Wells offered USAG Hohenfels as an example of how well all parties pulled together to achieve the mission.

"When we started this project, we needed to improve functionality, increase security, improve safety and reduce contract guard manning," Wells said. "We've pretty much covered those areas."

After 9/11, the Army's product manager for force protection systems selected Huntsville Center to plan and manage ACP upgrades worldwide. By 2002, the Office of Provost Marshal General was given a special appropriation by Congress mandating development of updated ACP standards at all Army facilities. Huntsville Center was then tasked to plan and manage the gate update initiative, including survey, design, purchase and installation of ACP equipment at Army installations worldwide.

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At Fort Knox: Army's largest furniture project complete

by Debra Valine

When the Human Resources Center of Excellence at Fort Knox, Ky., officially opened for business, the largest furniture procurement project to date for the U.S. Army Engineering and Support Center, Huntsville, came to a close.

A ribbon-cutting ceremony May 27 dedicated the complex to Lt. Gen. Timothy J. Maude who died in the 9/11 terrorist attack on the Pentagon. Maude was the Army's deputy chief of staff for personnel at the time of his death.

Two commands will occupy the HRCoE's six buildings: U.S. Army Accessions Command and the Human Resources Command. The facility is about 880,000 square feet and will accommodate 4,418 Soldiers, civilians and contract employees.

Accessions Command moved into the facility in June. The Human Resources Command will move in between June and the end of September. The commands are relocating from Alexandria, Va., St. Louis, Indianapolis and Fort Monroe, Va.

The Corps' Louisville District managed the project, and Huntsville Center was responsible for the furnishings. The Huntsville Center executes the centrally managed Furnishings Program for Army installations worldwide, through funding provided by the Installation Management Command.

"We purchased administrative furniture for the entire facility," said Maj. James Hanks, project manager for the Furnishings Program at Huntsville Center. "We took the comprehensive interior design that was created for the facility and used our procurement process to purchase all the admin furniture."

The $14.6 million project awarded 23 contracts to three prime contractors: Knoll Inc. of East Greenville, Pa.; Steelcase Inc. of Grand Rapids, Mich.; and UNICOR Federal Prison Industries of Atlanta.

Acronyms and Abbreviations	
HRCoE	Human Resources Center of Excellence

"We had a significant savings over the original estimate because of the size of the order," Hanks said. "The original estimate was $28.8 million; we cut the price by about 50 percent."

Huntsville Center received the furniture order in December 2008. The team started working the order in March 2009, awarded contracts in September and October 2009, started installing furniture in February and finished by the furniture install completion date May 21.

"This project took longer because of the size of the project," Hanks said. "The average cycle for procurement of furniture is probably six to seven months from the time we get the order until installation begins.

"We had to figure out some of the stuff along the way," Hanks said. "It has been a great learning experience and has helped us significantly reduce the time on another big project at Aberdeen Proving Ground, Md. It helped us know what questions to ask to expedite other large projects."

The logistics of getting the freight through the gates and the handling of recyclable packing materials posed challenges. At the beginning, about 30 truckloads of furnishings were delivered per week.

One thing done differently on this project that was important to its success was having an overall contractor project manager — Knoll, Hanks said.

"They worked with the other contractors to coordinate efforts," he said. "That process worked very well. We plan to use it on other projects as well. It takes us out of the day-to-day operations."

Louisville District did a technical review of Huntsville Center's procurement scope documents.

Workers assemble cubicles in the HRCoE at Fort Knox, Ky. Photo by Maj. James Hanks

"We worked very closely with Huntsville Center on the furniture procurement and installation for HRCoE and were very pleased with how it worked out," said Mike Ryan, project manager, Louisville District. "The commitment to success and the flexibility to adjust to rapidly changing requirements from two major users shown by Maj. Hanks and the entire Huntsville Center furniture team were key to the success of this project."

"This project was extremely fast paced," said Karen Sweeney, Louisville District's resident engineer at Fort Knox. "The Huntsville Center team has done a lot of heavy lifting in meeting changing demands."

Col. Scott B. Cottrell, the Base Realignment and Closure chief for Accessions Command, worked with Huntsville Center's furnishings team on furniture decisions.

"We have been in the new facility," Cottrell said. "The furniture seems to be good quality, and the cubicles have good space. The office furniture has a nice wood finish with a rich feel, especially the executive offices."

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Corps takes going green to new heights

by JoAnne Castagna

The multi-story Department of Defense administrative office complex under construction in Alexandria, Va., is the tallest structure in the region and the tallest building ever erected by the U.S. Army Corps of Engineers.

What is not as obvious may be more impressive. This is the Corps's first project of this size working for Leadership in Energy and Environmental Design Gold certification and the only one in the region that will save 30 percent of the energy of a traditional complex and save taxpayers millions.

In March 2009, the Corps' New York District began constructing the design-build complex in partnership with Duke Realty Corporation and Clark Construction. The complex will be home to multiple DoD agencies that are currently occupying leased space throughout the national capital region. The project implements the 2005 BRAC Recommendation #133 and, when completed in September 2011, will become a part of Fort Belvoir, Va.

The 1.7 million-square-foot facility sits on a 16-acre campus and comprises two towers — 15 and 17 stories, two parking garages, a visitor center, a remote inspection facility and a public transportation center.

"Originally our goal was to make part of the complex certified LEED Silver and another part certified LEED Gold," said Joanne Hensley, New York District's chief of project development for BRAC 133. "We reviewed our original design plans and realized we were only shy one point from having the entire complex certified LEED Gold, so we are shooting for LEED Gold for the whole complex."

LEED is the internationally recognized U.S. Green Building Council certification system. Certification level is based on the number of points earned; LEED Gold is one of the top levels.

Indoor lighting

The entire complex will have LED and fluorescent lighting, which will cost a bit more to purchase upfront but will reap tremendous savings down the road. These types of lighting require less electricity to run and will last up to eight years longer. Room occupancy sensors will automatically turn lights on and off depending if a room is occupied, which will conserve light use.

Natural lighting will also be used. The complex is being constructed with large shatter-proof windows that will allow outside light into the building, and work stations inside the complex will have low partitions to make sure adequate light can spread throughout the building.

Indoor air quality

Low cubicle partitions will also help air circulation and improve air quality, another team goal. The complex will have an energy-efficient central air system that will keep the indoor air comfortable year-round, and the complex's large windows will be highly insulated to prevent air from leaking out.

Fresh air is also necessary for healthy indoor air quality, so a system will allow fresh air to move into the building without wasting considerable energy.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
DoD	Department of Defense
LEED	Leadership in Energy and Environmental Design

The team is constructing green roofs on the visitors' center and remote inspection facility. Green roofs have vegetation, hold in warm indoor air during the winter and keep building interiors cool during the warmer months. Some of the structures will have special rooftops that will reflect the sunlight, keeping indoor air cool during the warmer months.

Indoor air toxins are also a threat to air quality, and the team is taking measures to minimize them by using paints, carpets and wooden furniture that emit lower levels of toxic fumes. After painting and carpeting and furniture installation have been completed and before DoD personnel move in, the team will air out the structures to further reduce any toxic fumes.

Precast exterior wall panels are quickly rising to the top of one of the office towers at the DoD Office Complex in Alexandria, Va. Photo by Marc Barnes, U.S. Army Corps of Engineers

Honolulu District replaces hydrant fuel system at joint base

by Deane Shephard

The U.S. Army Corps of Engineers is installing a new, up-to-date hydrant fuel system at Joint Base Pearl Harbor-Hickam, Hawaii. The Type III hydrant fuel system replaces the existing Type II Phillips System for the Air Mobility Command ramp. The new system, funded by the Defense Logistics Agency, is a major upgrade to the old system.

The Type III system is designed to deliver fuel to aircraft and is regulated by pressure. When an aircraft takes on fuel from the system, the pressure in the fuel line drops. This drop in pressure signals a pump to automatically activate to restore the set point loop pressure.

If another aircraft needs fuel at the same time, still another pump will activate to restore the design pressure in the fuel line to its operating pressure. Conversely, when the first aircraft is fueled, the valve is closed in the hydrant pit and the pressure in the fuel line loop increases, one of the pumps will sense the increase and shut off. When the final aircraft is fueled, the last pump will sense the pressure buildup in the loop, and the pump will automatically shut off.

The construction of the pump house was done so that the pumps and large piping work were installed before the pre-engineered metal building was erected. The advantage of this sequence was that the piping and pumps could be hoisted in place, which also made for a much safer equipment installation. Otherwise, these pipes and pumps would have had to be installed manually.

At Joint Base Pearl Harbor-Hickam, a fuel tank rests on stys so that new foundation ring walls and sand bedding can be installed underneath. Photo courtesy of Honolulu District, U.S. Army Corps of Engineers

During installation, the pump motors were protected by tarpaulins bound tightly around the motors. The pre-engineered building was then erected over the pump equipment and piping with relative ease.

A special feature of this project was the refurbishment of the two existing fuel tanks. The plans called for the replacement of the tanks' foundation ring walls and the oiled sand bedding upon which the tanks set. To implement this plan, the tanks had to be lifted eight feet in the air and set on temporary cribbing structures called "stys." The stys were created with 5-foot-long 6-inch-by-6-inch lumber pieces set in alternating directions in rows of three pieces each.

Lifting the tanks required a detailed plan that considered all aspects of maintaining the structural integrity of the tanks.

Prior to the lift, an extensive engineered cable support system was rigged so that the floor of the tank would be supported during the lift. Once the cable system was installed and inspected, air bags were inserted in an interstice made in the tank foundation ring wall. The bags were inflated in a sequence around the tank ring wall. Then sty supports were ➤

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Water efficiency

The complex will use almost 50 percent less water than a traditional building of the same size, a savings of 4.5 million gallons of drinking water annually. Low-flow faucets, urinals and showerheads will be used, and drought tolerant native plants will eliminate the need for landscape irrigation.

The team is also constructing a bioswale to catch rain water, slow the water runoff and capture sediment and contaminates before they go into storm drains.

Recycling

It is estimated that, when the project is completed, 6 million pounds or 75 percent of construction waste will have been recycled. The team is also recycling some of the trees removed for construction. The wood from these trees will be used for wall paneling.

In addition, a 500-square-foot area in the loading dock will have recycling bins, and bins will be stationed on each floor of the towers.

Transportation

Special parking for van pools, carpools and fuel efficient hybrid vehicles in the complex's two parking garages, along with 300 bicycle racks and showers for bicyclists, will encourage employees who use alternate means of transportation. The complex's mass transit center will provide access to the Metro Bus, Dash Bus and DoD Shuttle.

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Eglin Air Force Base project upgrades infrastructure for F-35

by Dale Smith

The U.S. Army Corps of Engineers' Mobile District took on a huge infrastructure project for Eglin Air Force Base, Fla. The design-bid-build project provides domestic water, a sanitary sewage lift station, fire protection water, communications and electrical power to ongoing and future F-35 Joint Strike Fighter facilities.

Several F-35 facilities under construction at Eglin are dependent upon the essential utilities provided under the Mobile District's F-35 Infrastructure project, including a dining facility, a dormitory, an academic training center, an Air Force hangar and a Navy-Marine hangar. Future facilities include two more dormitories, an additional dining facility, two more Air Force hangars, a fuel cell maintenance hangar, parking apron, taxiway parallel extension, live ordinance load facility and petroleum-oil-lubricate upgrades.

The F-35 Infrastructure project intermeshes with existing buildings, hangars, streets, other ongoing construction projects, an active aircraft apron and other existing utilities. The job site overlaps, contains and is contained by other concurrent construction. Utility outages, lane closures, street crossings by jack and bore and cut and patch, tie-ins, occupied buildings, traffic, and known and unknown existing in-ground utilities added to the challenges.

The construction contractor had to coordinate and sequence his concurrent routes of sanitary pipes, communications ductbanks, fire water pipes, domestic water pipes and electrical 15-kilovolt power ductbanks. The construction contractor also had to coordinate his work on utilities, site work and road construction with other contractors working on adjacent F-35 projects.

A pumphouse is under construction and water tanks are being refitted as part of the $5 million F-35 Infrastructure project at Eglin Air Force Base. Photo by Dale Smith

The $4,623,000 project was award Feb. 5, 2009, and modifications totaling $522,725 have been issued to date with no time extension. The contract completion date is Aug. 3.

The project has five main features of work: domestic water, fire protection water, sanitary sewage, electrical power, and communications.

The domestic water facilities include 12-inch water pipe, 10-inch water pipe, two 1,463-gallons-per-minute pumps, two 50-horsepower motors with controls, a pumphouse, valves, tie-ins, a transformer, an addressable fire alarm system, a sprinkler system and site work.

The fire protection facilities include 16-inch pipe, 14-inch pipe, 10-inch pipe, three 1,500-gpm pumps, three 200-hp motors with controls, a jockey pump, two 94,700-gallon welded steel water storage tanks, a pumphouse, an addressable fire alarm system, piping, valves, fittings, a sprinkler system, transformer, cathodic protection, fire hydrants and site work.

The sanitary facilities include a meter vault, a valve vault, an emergency power generator, three 694-gpm pumps, three 25-hp motors with controls, a transformer, a lift station wet well, a 6-inch force main, a 10-inch force main, a 15-inch gravity pipe, a 12-inch gravity pipe, manholes, plug valves, cathodic protection, site work and antenna tower telemetry.

The electrical power facilities include transition from existing overhead to ➤

Acronyms and Abbreviations	
gpm	gallons per minute
hp	horsepower
kv	kilovolt

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introduced systematically to transfer the tank load from the air bags to the stys.

The final lift phase transferred the tanks onto four system supports consisting of three steel beams across two sty towers. This phase transferred the tank load clear of the ring wall and allowed installation of a new ring wall foundation, clean sand bedding and a new cathodic protection system under the tanks. The cathodic protection system is designed in concentric rings to protect the tank bottom from corrosion.

After inspection of the bottom tank plates, the final extent of the tank bottom repair will be ascertained, and the tank will be lowered onto the new tank ring wall prior to the repair. The lowering of the tank will be accomplished by setting the tank onto bags of ice, which will melt and allow the tanks to settle on the new foundation wall.

Project completion is expected by April 2011.

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70-year-old Fort Lewis building gets makeover

by Andrea Takash

In 1940, Lt. Col. Dwight D. Eisenhower walked the hallowed halls of Building 600 at Fort Lewis, Wash., where he served as the executive officer for the 15th Regiment and its first battalion commander. Today, more than 70 years after construction, the structure now known as Building 2025, received a makeover by the U.S. Army Corps of Engineers, Seattle District.

A critical need existed to balance the historical preservation with delivering a leading-edge headquarters facility for current occupant, I Corps, said the district's project manager, Zach Zimchek.

"Building 2025 was in a failing state, and we turned it into a state-of-the art headquarters facility for I Corps, enabling them to provide critical command and control to forward deployed elements," Zimchek said.

With more than 96,000 square feet and space for about 360 people, this four-story building now features updated electrical, information technology and safety features. In addition to meeting the basic functional requirements, the contractor, Pease Construction, also created detailed trim work on the walls and around the conduits in the commander's wing.

Even though the building boasts many high-tech features, the aura of American history remains inside and outside.

The newly renovated Building 2025 at Joint Base Lewis-McChord, Wash., stands ready for returning I Corps Soldiers. Photo by Dane Gregory Meyer, DG Studio

"We worked closely with the Joint Base Lewis-McChord Cultural Resources Program," said Tim Wood, the district's project engineer. "During this renovation, very little work was done to the exterior — only what was needed to preserve its historic appearance. We also kept the original glass in the windows."

In addition to the historical focus, the project team also met the challenge of finishing the project on time for I Corps' return from a year-long deployment to Iraq. A project like this one normally takes 18 months, but the Corps of Engineers worked closely with I Corps. The result was that the work was done in only ➤

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new underground ductbank, manholes, concrete encased ductbanks, demolition of existing overhead primary, installation of primary power switches and an electrical substation extension, which includes a breaker structure, a 12,470-volt feeder, vacuum breaker, grounding grid, bus extension, concrete piers and pads, a relay, a test switch, 15-kv cables and site work.

The communications facilities include concrete encased ductbanks; fiber-optic cables of 144 strand, 120 strand, 72 strand, 48 strand, 36 strand and 12 strand; manholes, copper cables of 900 pair, 600 pair, 400 pair, 300 pair, 200 pair and 100 pair; interducts and cable connections. Connections and splices must be made to existing communications in numerous locations.

Lessons learned from the F-35 Infrastructure project are:

- Eglin Exterior Electrical Shop prefers sectionalizers in lieu of manholes for primary power for reasons of faster repairs, less down time of outages and faster location of faults. Sectionalizers are less expensive, quicker to install than manholes, would have reduced the project cost and conflicts with existing in-ground utilities, and would have allowed primary power availability sooner to other construction projects.
- Completion of the various utilities should have been required in phases within a specified number of calendar days after notice-to-proceed. With specific phases of completion, the government could have better planned the availability of new utilities.
- The contract performance period should have been about 300 calendar days instead of 480 calendar days. The shorter period would have forced the contractor to perform and manage its resources in an optimal manner.
- Design documents were not accurate enough on the routes of new utilities. Some existing utilities were not shown nor adequately located by others during excavations and trenching. Manholes were not optimally located for other ongoing projects. The user requested significant changes for fiber-optic cables, and power needs of some future projects required electrical power changes during construction.

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In South Atlantic Division: Major impact with minor construction

by Fleming James

There's always something to be done. Every military installation has a responsible and capable Directorate of Public Works, typically with too few people for so much work, too little money and not enough time to get it all done. The DPW is constantly setting and adjusting priorities based on factors such as the urgency of keeping facilities functional, the cost of solutions, the expectations of the installation commander and, ultimately, the demands of meeting military requirements.

The director of Public Works has multiple options that often pull from opposing directions. The result is one "top" priority being delayed while another "top" priority is resolved.

Is there ever a solution? Knowing what needs to be done, while having money to pay for it and having the people to do the work are key ingredients for a solution. The American Recovery and Reinvestment Act provided funding for qualified projects. ARRA funding provided people — some permanent, many temporary and most employed through contractors. Providing jobs is the goal of ARRA, and performing crucial work is the means.

ARRA funds were distributed among the federal agencies, which then apportioned them to regions according to the approved projects' locations. The U.S. Army Corps of Engineers worked with the Installation Management Command to identify minor construction projects that were high priority and ready to be awarded as soon as money was available.

Acronyms and Abbreviations	
ARRA	American Recovery and Reinvestment Act
IMCOM	Installation Management Command
O&M	operations and maintenance
USACE	U.S. Army Corps of Engineers

A storm sewer is repaired at Fort Benning, a project that used ARRA funds to improve infrastructure. Photo by Matthew Vera, Savannah District, USACE

The USACE South Atlantic Division, which includes five districts, immediately identified 65 operations and maintenance projects on eight installations for ARRA funding. Military Construction is handled for the region primarily by Savannah and Mobile districts. By the end of the fiscal year, within 12 weeks of the money being made available to USACE, the Savannah District awarded O&M contracts for those 65 projects and by Nov. 2, issued notices to proceed for all 65.

"All of the projects awarded were to improve the living conditions of the military Soldiers and their families," said Russette Faye Hazelwood, Savannah District contracting officer. "We awarded two child development centers and a youth center, repairs or renovations to barracks, chapels, medical facilities and fire stations."

These awards allowed contractors to retain employees who could otherwise have been terminated and, in many cases, allowed contractors to hire additional employees. An additional 15 projects have since been awarded, for a total of 80.

The Mobile District awarded several O&M contracts for Fort Rucker, Ala., but was primarily responsible for 85 Tri-Care Medical projects at installations within and beyond the region.

The Savannah District issued 41 notices to proceed at Fort Bragg, N.C., and eight at Pope Air Force Base, N.C. Projects vary from repairing taxiways, parking lots and traffic signals to replacing roofs; from repairing storm-water systems and controlling erosion to treating ➤

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nine months, before the Soldiers returned and six weeks ahead of the accelerated schedule.

"After construction started in June 2009, we were in constant communication with the I Corps commanders in Iraq via the rear detachment command element," Zimchek said. "It was very important to both the Corps of Engineers and contractor, Pease Construction, that the renovated building met the needs of the Soldiers."

"Our approach was that failure was not an option," said Rick McDonald, Pease Construction project manager.

Despite the many unforeseen requirements that nearly doubled the effort, the project team delivered the building March 1.

"What should have taken 18 months, took nine months," said Lt. Gen. Charles Jacoby, I Corps commanding general, during a ribbon cutting ceremony March 15. "We thank you. You gave us the opportunity to get back to work."

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Fort Eustis showcases bridges constructed of recycled material

by Monica Miller Rodgers

Fort Eustis, Va., held a media day May 27 to show off its two newly constructed recycled structural composite bridges.

The bridges that had been replaced were made of wood, and they had aged to a point of concern in supporting the engines and rolling stock used by the U.S. Army Transportation School during training of Transportation Reserve Soldiers in the proper operation of locomotives.

"This has been a great project," said Phil Reed, Fort Eustis Engineering Division chief, speaking about one of the new bridges during the event. "The bridge was made out of nearly 100 percent recycled product, and it was a winning situation between Fort Eustis and our contracting team. Not only will it cut our maintenance cost for years to come, but it will last longer than the 57-year-old bridge we removed."

The two new railroad bridges are the first of their kind in the United States, although recycled material has been used to construct bridges for other traffic. The bridges are made completely of RSC, a nearly 100 percent recycled material made of post-consumer and industrial plastics. The new bridges have a load capacity of up to 130 tons and were designed to weight and speed limit standards.

Acronyms and Abbreviations	
RSC	recycled structural composite

"The magic to this material is quite simple; we're taking 100 percent recycled materials and pulling them out of landfills and re-diverting them into useful life," said Jim Kerstein, CEO of Axion, the producer of the RSC. "For example, 20-year-old milk jugs laying around that have not degraded can now be used as recycled materials."

The Fort Eustis Directorate of Public Works oversaw the work on the bridges of the main contractor, Centennial Contractors, and subcontractors Axion, English Construction Co. Inc., B&R Contractors, McCallum Testing, Parsons Brinckerhoff and Innovative Green Solutions since the contract was awarded in September 2009 for $1.37 million.

An Army Transportation School locomotive and caboose crosses a bridge constructed of RSC material. Photo by Tetaun Moffett

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barracks for mold and moisture; from painting building interiors and exteriors to demolishing sheds. Each of these projects is clearly necessary but had been delayed until ARRA provided the funds.

The preponderance of projects at Fort Bragg is due to Base Realignment and Closure, which relocated several command headquarters there. While South Atlantic Division is completing major construction projects funded prior to ARRA, the installation infrastructure on Fort Bragg required additional improvements that are minor in scope but major in changing the overall appearance and function of the facilities.

In addition, Savannah District awarded 12 projects at Fort Benning, Ga., and 11 at Fort Gordon, Ga.; six at Fort Rucker, one at Military Ocean Terminal, Sunny Point, N.C., and one at Fort Jackson, S.C.

ARRA requires that funded projects meet specific criteria:

- The project is already planned, designed and ready to obligate when funds are received.
- The project can be quickly executed by contract or direct hire of temporary labor.
- The project will immediately result in higher temporary or permanent employment either by the government or the private sector.
- The project has a low risk of falling behind schedule with the ARRA funding.
- The ARRA obligation will allow the project to be completed or a phase or element of the project to be completed.
- A useful service will be able to continue without needing additional funding beyond the ARRA supplement.

Each ARRA project awarded by South Atlantic Division met these criteria. The minor construction projects will have major impact. Facilities and infrastructure will be noticeably improved, which will significantly enhance the quality of life for the military and their families who live and work on the installations. Soldiers' barracks and work areas will be repaired, the appearance and safety of entire installations will be upgraded, and employment among the general population in the five districts will be increased.

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Fleming James is a public affairs specialist, South Atlantic Division, USACE.

Hawaii garrison uses electronic system to track infrastructure

by David Pawlak

Army installations are a complex network of systems and facilities tied together to create a fully functioning and harmonious city within a city. Installations are dependent upon these interrelated components working in unison.

Disjointed utility systems can throw off the delicate balance of an installation and cause it to fail. Without fully functioning water, electrical, wastewater or communication systems, the facilities and missions that they support can be brought to their knees.

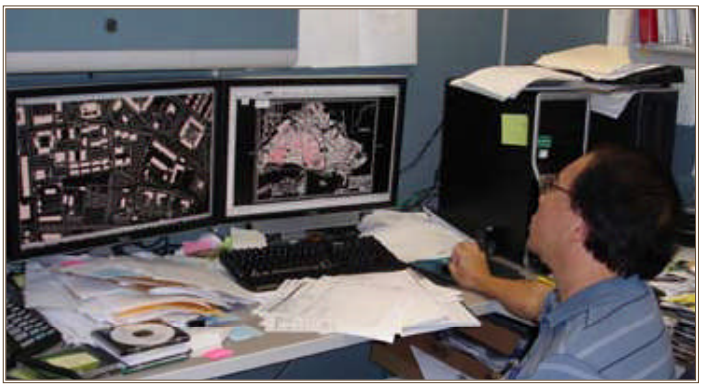
Many times, these systems are taken for granted, because they operate without interruption behind the scenes, 24 hours a day, seven days a week. Every now and then, natural disasters serve up reminders of this delicate balance by wreaking havoc and devastation. The Haiti earthquake is just one sobering reminder of what Mother Nature can do.

It may appear to be easy to keep all of these systems operating, but there are several interrelated systems that must work together to allow infrastructure to keep on ticking. One such system U.S. Army Garrison Hawaii uses is a computer-aided design-and-drafting geographic information system.

USAG Hawaii's CADD-GIS systems allow it to quickly view, update and electronically change infrastructure maps and drawings as the installation changes. Each time a new building is brought online or demolished, drawings and as-builts are updated to reflect the changes that have occurred on the installation footprint.

As more and more of the utilities are relocated underground, it is extremely important that this information is captured electronically to preserve it for future use. Although it is costly to collect this information, it is even more costly to inadvertently dig up and destroy a utility line that supports the mission of warfighters.

The easiest way to reference this information is by calling up a drawing on an electronic CADD-GIS system. With the simple touch of a button, various utility data layers can be turned on or off to conduct detailed analyses. These electronic drawings allow a look at the installation from the inside out and help staff to determine what, if any, impacts there would be should the utilities be disturbed.



Channing Fukuda, USAG Hawaii DPW computer engineer, calls up a drawing of Schofield Barracks on the CADD-GIS. Photo by Rosemarie Jimenez, DPW, USAG Hawaii

Utility systems are just one set of data that can be accessed with a CADD-GIS system. Emergency personnel depend on USAG Hawaii's CADD-GIS maps for locating facilities when responding to emergency calls. Using outdated maps has caused delays in their response times and has, at times, meant the difference between life or death.

The Directorate of Public Works is the only resource for obtaining updated Army CADD-GIS maps for emergency personnel on USAG Hawaii installations.

Sometimes, it can appear that all of this data collection is a waste of time and money, with no readily apparent added-value to the mission. On the contrary, warfighters and USAG personnel today are more dependent than ever on the DPW's ability to produce maps of building interiors, installation infrastructure and training ranges.

USAG Hawaii's Environmental Compliance and Conservation offices use CADD-GIS information to track the locations of endangered species throughout the island chain. Digging permits are issued, using the information contained on these systems. Facility space assignments are made for tenants. Environmental spills are tracked and reported using CADD-GIS systems. Inventories of trees, roads, land and utility demarcation points, historic districts, cultural artifacts, roof conditions and utility line conditions are all tracked using CADD-GIS systems and databases.

Acronyms and Abbreviations	
CADD-GIS	computer-aided design-and-drafting geographic information system
DPW	Directorate of Public Works
USAG	U.S. Army Garrison

As hard-copy drawings have become older and more expensive to keep updated and maintained, it has become more necessary to maintain these files electronically. In today's virtual world, everyone is heavily reliant on the currency of electronic data to make informed decisions.

CADD-GIS allows USAG Hawaii to operate with fewer resources while minimizing the impact to the environment. Infrastructure and CADD-GIS go hand-in-hand when discussing installation support. CADD-GIS is the behind-the-scenes, unsung hero when it comes to operating and maintaining infrastructure.

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David Pawlak is the business operations chief, DPW, USAG Hawaii.

Why training plans are important

by Lt. Gen Robert L. Van Antwerp

As I continue to observe the critical roles that the Career Program 18 workforce has in executing current Army missions both in the United States and overseas, it is evident that now, more than ever, the Army needs to continue its focus on recruiting, training and retaining a highly skilled and professional civilian workforce. To that end, I cannot stress enough the importance of structured training plans to aid both our CP-18 interns and journeymen in their individual professional development.

These structured training plans provide the disciplined thought that guides disciplined action by our career program members, working in close cooperation with supervisors and mentors, to develop the competencies, skills, education and work experiences required to meet today's challenges while building capability and capacity for the future. This is fundamental to building a workforce to last.

The guiding doctrine, through the Army Civilian Education Training and Development System, is that each career program establishes master intern training plans and master training plans for all careerists. The MITP and MTP serve as the road maps for workforce development across the Army.

One of the greatest successes we have achieved that distinguishes our career program from others is our initiative, in cooperation with the communities of practice and supported commands, to prepare professional development maps for the top 30 job series within CP-18. Currently, 17 of the series maps are complete and represent more than 85 percent of our workforce population.

The remaining 13 will be populated and published by the end of this fiscal year. These maps serve as important career planning and development tools when used in conjunction with the MTP and MITP.

There are several factors of which interns, careerists, activity program managers and supervisors should be aware. MTPs show the proper blend of formal and on-the-job training, work assignments and self-development needed at each level to acquire required competencies in the career program or career field. For career program occupations, MTPs start with MITPs that apply to all career program interns regardless of whether they are locally funded or centrally funded by Department of the Army.

MTPs include the Civilian Education System leader development courses and incorporate PDMs. MTPs establish the CP-18 competency requirements and provide guidance on training alternatives. For ease of use, the MTP and MITP appendices are divided into job series, and subgroups within the job series describe the required specialized competencies' recommended certifications.

Find out more at *https://ekopowered.usace.army.mil/cp18/planning_your_career/pd_maps/*.

The MITP, MTP and the PDMs are important tools to assist our interns and careerists in building their own individual career paths in a disciplined way that sets the stage for disciplined career development action. By providing these roadmaps for development, we have identified the skills, training, education and experience necessary to grow a relevant, ready, diverse and technically proficient workforce meeting the needs of the Army and the nation in our journey to GREAT!

BUILDING STRONG individuals through disciplined thought and action.

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

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

Acronyms and Abbreviations	
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
MITP	master intern training plan
MTP	master training plan
PDM	professional development map

Call for ARTICLES

The September/October 2010 issue of the Public Works Digest will feature

Energy and Water

Deadline is Aug. 17

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

Los Angeles District takes interns on the road

by Chadi Wahby

A strange occurrence took place in the LA District building during one week in October 2009. All week, 40 cubicles were as quiet as Sunday morning, and elevator traffic was at an all-time low. The reason for the unusual state of affairs can be summarized in one word: interns.

Those empty cubicles belonged to the 40 interns who had joined the LA District that summer. On Oct. 13, the interns and several other district employees boarded a bus and departed on a four-day grand tour of the LA District for what has been described as a "road trip for the ages."

Covering the states of California, Arizona and Nevada, the trip was a chance for interns to see many ways in which the Corps fulfills its mission.

"We had two purposes with the road show," said Col. Thomas Magness, district commander. "The first was to impress upon our interns the rich history of the LA District and the powerful impact we have on the region. The second purpose was to create a forum in which the interns could connect with each other."

Also traveling were the division chiefs, executive office personnel and trip coordinators. The trip included stops at large Corps civil projects and Air Force bases, where the interns were introduced to military projects.

At each project, the interns were met by project managers, engineers, city representatives and military personnel, who presented tours and briefings. To build leadership skills, some interns were asked to prepare briefings on certain projects. They were able to learn projects firsthand and to practice public speaking.

On the first day, the bus visted the Los Angeles River Project, the Marina Del Ray Harbor and Prado Dam. The second day included a stop at the Tres Rios Project site and an exercise that involved paintballing and rock-wall climbing. The latter activities illustrated team unity, team reliance, communication, taking the initiative and trust. The day concluded with dinner with the mayor in Flagstaff, Ariz.

The third day featured a tour of the Rio De Flag Project, Nellis Air Force Base, Nev., military projects and an evening to mingle in Las Vegas. The final day included a tour of projects at Creech Air Force Base, Nev., and the Tropicana/ Flamingo Washes Project.

The time spent on the bus provided the opportunity for the interns to build bonds and for the district leaders to share their experiences and answer the intern's questions about the Corps.

"Ninety-six hours on a bus, paintball and a night in Vegas certainly helped us reach [our] objective," Magness said.

From flood control projects to fire suppression systems to airplane hangars, the interns were able to see the results of some of the work that had originated back in those district cubicles. It is one thing to know the Corps does great infrastructure projects for the United States while also creating environmental and recreational aspects to the projects; it is another thing to see the projects. The enormity and scope of each of the projects the interns saw gave them a better perspective on the organization of which they are a part.

"This was an amazing opportunity to observe several years' worth of projects in less than a week in a condensed tour of the Los Angeles District projects," one intern said.

As an intern, I was already proud to be a part of such a phenomenal organization. After seeing some projects and the breathtaking environmental restorations, I am even more proud and honored to be a part of something that is extraordinarily out of this world. A "road trip for the ages" is certainly an understatement.

Acronyms and Abbreviations	
LA	Los Angeles
USACE	U.S. Army Corps of Engineers

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Chadi Wahby is a Department of Army intern, LA District, USACE.

Interns pose in front of an unmanned aerial vehicle during their visit to Creech Air Force Base to view military projects. Photo courtesy of Chadi Wahby

IMCOM names Public Works champs

by Deb Mercurio

Lt. Gen. Rick Lynch, commanding general, Installation Management Command, announced the winners for the 2009 Directorate of Public Works Awards in April.

"I am proud of the winners and appreciate what they do for our Army by improving the quality of life for Soldiers, families and civilians," Lynch said.

Garrisons submitted nominations to the regions where the nomination packages were evaluated. Six individuals and two organizations were chosen for their outstanding contributions to the command's mission.

William L. Sanders

U.S. Army Garrison Fort Belvoir, Va.

William C. Gribble Directorate Public Works Executive of the Year Award

William L. Sanders
Courtesy photos

Sanders, director of Public Works at Fort Belvoir, has more than 30 years experience in facilities, military funding, design and construction with successful execution of more than 140 projects. For the Base Realignment and Closure program, which brings more than 20,000 additional personnel, Sanders inspired his team to address associated issues, such as environmental concerns, transportation, housing, infrastructure, community relations, and energy and utilities.

His efforts to put delivery mechanisms in place have identified Fort Belvoir as an industry leader in its Sustainment, Restoration and Modernization program.

Acronyms and Abbreviations	
DPW	Directorate of Public Works
IMCOM	Installation Management Command
USAG	U.S. Army Garrison

His goal is to provide the best possible customer service.

Sanders is a strong supporter of the Army's Engineer and Scientist Career Program and intern development programs.

Daniel C. Hong

USAG Camp Red Cloud, Korea

DPW Engineering and Planning Executive of the Year

Daniel C. Hong

Hong, the chief, Engineering and Services Division, is recognized as an excellent performer and outstanding leader. Hong has successfully managed and executed the design, construction and service contracts at 250 percent above the division's normal capability.

He is responsible for reviewing all design and construction documents for technical sufficiency and constructability, and for structural safety inspections and troubleshooting. He resolves technical issues during and after construction, fosters a customer service oriented work place and provides a variety of engineering support.

Hong volunteers for the Society of American Military Engineers and the Association of Friends of American-Asian Pacific Islanders, and is an active participant and volunteer for organizational events and activities.

Gerhard Spuhler

USAG Kaiserslautern, Germany

DPW Business Management Executive of the Year

Spuhler, chief, Management Engineering and Systems Branch, is an Army Lean Six Sigma Green Belt. Spuhler supervises all DPW work coordination within the Work Order and Information Technology sections.

Gerhard Spuhler

He oversees the continuity of work among all transformation projects. He makes sure all projects are prioritized, designed, estimated and executed effectively.

Spuhler is also active in the reprocurement of a five-year, total maintenance contract, valued at more than $100 million, that will reduce work order processing time and improve the DPW's annual work plan. He has been key in capturing quality-of-work priorities across the 11 installations in the garrison footprint as well as the development of separate utility, road, infrastructure and roofing project priorities.

Pamela R. Hirota

USAG Hawaii

DPW Housing Executive of the Year

Pamela R. Hirota

To Hirota, a housing management specialist, Residual Housing Services and Referral Team, the top priority is taking care of Army families. Hirota's contributions have led to vast improvements in the quality of life for service members and families.

She is a recognized expert in community housing in Hawaii for all branches of the military. She has served as the primary point of contact for the deployment of the Automated Housing Referral Network, a rental database.

(continued from previous page)

Hirota implemented the Volunteer Realtor Program at the Fort Shafter Housing Services Office, forming a partnership with the Honolulu Board of Realtors. She also speaks at the National Association of Residential Property Managers Oahu Chapter's meetings, strengthening the Army's relationship with the local real estate community.

Monica A. Stephenson

USAG Fort Bragg, N.C.

DPW Operations and Maintenance Executive of the Year

Monica A. Stephenson

Stephenson, chief, Operations and Maintenance Division, manages 28 service contracts valued at $17 million for grounds maintenance, refuse collection, and maintenance and repair. Stephenson leveraged an e-mail system that advises customers of the work order status and invites comment on the service. Any negative comment is researched and resolved to the customer's satisfaction.

She also started a comprehensive quality assurance process that randomly selects and inspects completed service orders for workmanship quality and completion timeliness. She led the development of a preventative maintenance program resulting in the minimization of repairs.

Stephenson uses the Service Order Assessment Program to monitor the major trades within the division, track service order assignment and completion, and measure performance against benchmarks. The data is managed for optimum scheduling, and mechanics receive service order listings that are organized for efficiency in the field.

Paul G. Wirt

USAG Fort Bragg

DPW Garrison Support Executive of the Year

Paul G. Wirt

Wirt, chief, Environmental Management Branch, coordinates the review and assessment of actions that may impact the installation's environment and natural resources. Wirt is also responsible for about $15 million of environmental compliance, conservation and pollution prevention projects.

He successfully integrated environmental and natural resource planning into one multifunctional team. He leads Garrison Goal Team #1 – Sustainable Community, the foundation of the award-winning Fort Bragg Sustainability Management System, which has changed how business is conducted on the installation. He is responsible for an aggressive internal review program that identifies deficiencies long before regulatory inspections, and he is a leader in developing innovative partnerships. He also led the development of a multi-disciplinary team focused on reducing energy consumption and life-cycle costs of facilities.

Wirt's safeguarding of government funds resulted in significant cost savings on contract work allowing the execution of additional projects.

Savannah District, U.S. Army Corps of Engineers

DPW Installation Support Program of the Year

Savannah District was nominated by USAG Fort Benning, Ga., and Fort Bragg. The district was recognized for providing superior service through its engineering support and services.

At Fort Benning, Savannah District designed and constructed $333 million in projects, such as the Martin Army Community Hospital replacement complex.

At Fort Bragg, the district successfully met tight deadlines on American Recovery and Reinvestment Act, Military Construction Program and Sustainment, Restoration and Modernization Program projects to meet redeployment schedules.

Total Maintenance Stuggart

DPW Support Contractor of the Year

*TMS contractors Winfried Hartmann and Charles Houpt display TMS's IMCOM-*Europe Contractor of the Year *plaque, which preceded their Public Works award win.*

Total Maintenance Stuggart was nominated by USAG Stuggart, Germany. The contractor continually seeks ways to improve the delivery of services and supplies, and demonstrates a true commitment in customer service. During the past year, it completed 17,746 service orders, 15 Army family housing projects and 116 operations and maintenance and repair projects.

The contractor concentrates on three areas: communication, resourcing and quality assurance. It proactively works to apply energy-efficient technologies to better support the garrison.

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Deb Mercurio is with Public Affairs, Headquarters, IMCOM.

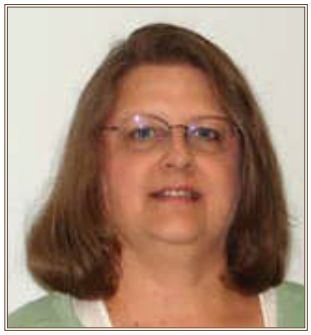
Allen named Installation Support Professional of the Year

by Pete Almquist

The U.S. Army Corps of Engineers selected Alicia Allen as the Installation Support Professional of the Year. Allen is the manager of the Army Furnishings Program at the Engineering and Support Center, Huntsville, Ala. The award will be presented at the USACE Summer Leaders Conference in August.

The award recognizes the USACE professional who has made the most significant contributions to Army installation public works in a noncontingency theater. A selection panel of representatives from the Office of the Assistant Chief of Staff for Installation Management and Headquarters, USACE, reviewed the nomination packages and recommended Allen for the award.

Allen leads a USACE-wide virtual team that provides centralized management for procurement and installation of furnishings for Army barracks and administrative offices. In fiscal 2009, the team furnished 374 administrative buildings and 57,000 barracks spaces. The program has placed roughly $800 million in furnishings to date, with almost $400 million planned for fiscal 2010.



Alicia Allen
Photo courtesy of Huntsville Center

Acronyms and Abbreviations	
OACSIM	Office of the Assistant Chief of Staff for Installation Management
USACE	U.S. Army Corps of Engineers

Allen, recognized as the Army's furniture procurement and installation subject matter expert, frequently speaks to national groups and writes numerous articles on the subject.

Her leadership has directly resulted in more than $125 million in cost avoidance, which was reinvested into procurement of additional furniture, enhancing quality of life for Soldiers.

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Pete Almquist is a senior program manager, Installation Support, Headquarters, USACE.

Army takes prizes in Federal Planning Division Awards

by Andrea Wohlfeld Kuhn

The Army was well represented among the winners of the 2009 awards presented by the Federal Planning Division of the American Planning Association at its National Training Conference in April.

The U.S. Army Corps of Engineers' Master Planning Professional Training and Development Program received the *Outstanding Federal Planning Program* award.

The program includes four comprehensive, fully accredited master planning classes; the annual Army Master Planning Symposium; six hours of master planning instruction at the Garrison Pre-Command course; and on-site workshops tailored to specific installation or agency needs.

For a complete list of all the classes available through the USACE Learning Center, go to *http://ulc.usace.army.mil/*.

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

Honorable mention in the Outstanding *Federal Planning Program* category recognized area development guides for Program Objective Memorandum projects at 15 Army installations. The U.S. Army Engineering and Support Center, Huntsville, Ala., sponsored the nomination.

Honorable mention in the *Outstanding Federal Planning Project* category went to the Fort Hamilton, N.Y., Real Property Master Plan. Huntsville Center sponsored this nomination, too.

In the Area Development Plan category, USACE's Tulsa District sponsored the nomination for the winner, the Airmen in Training Community Zone Town Center, Sheppard Air Force Base, Texas, Area Development Plan.

Members of the Army master planning team (left to right) Andrea Kuhn, Jill Schreifer, Jerry Zekert, Mark Gillem and Lindy Wolner pose while teaching a course in Portland, Ore. Photo courtesy of the Master Planning Professional Training and Development Program, USACE

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Andrea Wohlfeld Kuhn, AICP, LEED Green Associate, is a senior planner, Headquarters, USACE.

Slockbower directs Corps' Military Program

by Mary Beth Thompson

When Bob Slockbower speaks to a large group, he wears a wireless mike and walks around the room as he talks. Take it from someone who has tried to photograph him in action on these occasions and, more than once, has caught only an arm, the back of his head or just thin air, Slockbower moves constantly and quickly. He's known for it.

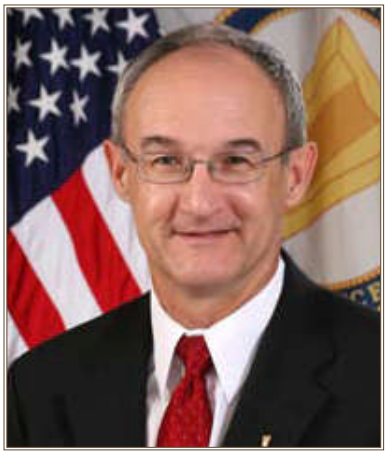
Slockbower is also well-known as the functional chief representative of Career-Program 18. He views nurturing the Army's 18,000-person engineer and scientist workforce as very important and devotes a significant part of his vaunted energy to recruiting, training and retaining CP-18 careerists.

In January, Lt. Gen. Robert L. Van Antwerp, the chief of engineers, selected Slockbower for one of the most important civilian positions in the U.S. Army Corps of Engineers, the director of Military Programs. He works under Maj. Gen. Jeffrey J. Dorko, the deputy commanding general for military and international operations. He also continues as the functional chief representative for CP-18.

Slockbower has spent the last seven years working for USACE after a 28-year military career. He earned his bachelor's and master's degrees in civil engineering from Lehigh University, Bethlehem, Pa., and he is a registered professional engineer in Virginia.

Upon graduation, Slockbower was commissioned as a 2nd Lieutenant in the Army. He held a number of assignments with combat and construction engineering responsibilities. He served as a platoon leader in a Bailey bridge company, company commander in a Corps combat engineering company, operations officer in a combat heavy engineer battalion and a brigade engineer for an armor brigade.

Acronyms and Abbreviations	
ARRA	American Recovery and Reinvestment Act
BRAC	Base Realignment and Closure
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
DPW	director/Directorate of Public Works



Bob Slockbower
Photo by F.T. Eyre

He also served as a project engineer in Saudi Arabia with the Riyadh District executing the Saudi Arabian Naval Expansion Program, as the Gulf Regional engineer in Kuwait for USACE's Transatlantic Programs Center and in a variety of positions in the New Orleans District, including chief of Real Estate and deputy chief of Projects Branch, Operations Division. He commanded the Chicago and Louisville districts and was deputy commander of the former North Central Division.

Slockbower also served as deputy director of Public Works in a NATO assignment in Turkey and director of Public Works at Fort Campbell, Ky. He retired as a colonel in 2003 and went to work for USACE's Southwestern Division as the director, Military and Technical Directorate, a position that transformed into the director of Regional Business in 2004.

He deployed to Iraq in 2004 to serve as the director of Construction, and then as the director of Programs, for the Project Management Organization. He returned to Iraq in 2005 as the deputy director of the Projects and Contracting Office.

As director of Military Programs, Slockbower is responsible for policy, programming and technical support for USACE's program for design, construction and environmental activities for 103 Army installations, 60 Air Force installations, other federal agencies and foreign countries. In fiscal 2010, that program comprises about $28 billion of ongoing work.

"We are extremely busy and focused right now, awarding the last of the 2005 Base Realignment and Closure projects and aggressively executing the construction necessary to support the restationing required to meet Department of Defense mission requirements and to comply with BRAC law," he said. "In addition to executing our base program, we have extensive work ongoing in Iraq and Afghanistan as we continue to wind down our major construction activities in Iraq, while simultaneously swinging resources to execute emerging construction activities in Afghanistan."

Slockbower also talked about USACE's efforts to help stimulate the economy with about $3 billion in American Recovery and Reinvestment Act funds going toward Military Construction. As part of ARRA, USACE is also heavily involved in executing the Housing Assistance Program, which provides assistance to surviving spouses, wounded warriors, transferring Soldiers and civilians transferring due to BRAC, he said.

Slockbower's strong technical background combines with his energy and his enthusiasm for both public service and the Army to meet the requirements of this very demanding job.

"This was an ideal opportunity after completing my active military service to be able to use my talents, skills and abilities in an area where I have a great passion," he said.

Slockbower is focusing current Military Program efforts in two ways. First, he is building upon past ➤

De Jesus leads IMCOM sustainment, restoration, modernization efforts

by Mary Beth Thompson

Some might call Gustavo (Gus) De Jesus a pessimist. But they would be wrong.

"It's just that I like to always think about what could go wrong, so when I'm faced with the worst, I'm ready to respond to it. I already anticipated it, so it's not a surprise," said De Jesus, the chief of the Sustainment, Restoration and Modernization Management Branch, Headquarters, Installation Management Command.

De Jesus, a natural leader, embodies a take-charge mindset in all facets of his life, whether at work, at church or planning an event at home.

"If there's something that needs to be done, it doesn't matter whether it's my job or not, I just jump on it," he said.

That can-do spirit started at an early age. As a member of the school band, De Jesus took on any instrument the school wanted someone to play. He plays trumpet, trombone, sax, clarinet, piano, guitar and percussion instruments.

De Jesus earned a bachelor's degree in civil engineering from the College of Mayaguez in Puerto Rico. After college, he worked as a civil engineer for three years at the Monongahela National Forest, W.Va.

Gustavo (Gus) De Jesus
Photo by Fort Sam Houston Photo Lab

He started his Army civilian career as a master planner at Fort Stewart, Ga. A year later, De Jesus moved to Europe where he worked for 20 years in directorates of Public Works across Germany. He moved from Giessen, to Aschaffenburg, to Wuerzburg, to Heidelberg in jobs that covered the full gamut of Army Public Works.

De Jesus returned stateside to the Installation Management Agency's Southwest Region as the chief of Business Management and Housing Branch, which later became the Business Management Branch of IMCOM West Region. Last October, he was named the acting chief of the SRM Management Branch in Headquarters IMCOM's Public Works Division. In March, De Jesus was selected as the branch chief.

Acronyms and Abbreviations	
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
DPW	Directorate of Public Works
IMCOM	Installation Management Command
SRM	Sustainment, Restoration and Modernization

His responsibilities include review and approval of work classification for projects, the Army Transportation Infrastructure Program, oversight of municipal-type services like solid waste management, the technical aspects of public works business operations, the Installation Status Report for infrastructure common levels of support, facilitating installation technology transfer demonstrations, and the engineering pieces of antiterrorism and force protection.

To help with these responsibilities, De Jesus has seven staff members on board. He is recruiting to fill eight vacancies. ➤

(continued from previous page)

achievements in planning and execution by applying lessons learned to refine prior transformation efforts to further improve project delivery. Second, he is working on near-, mid- and long-term strategies to meet very ambitious sustainability and energy performance goals — specifically, what can and should USACE do now and plan to do in the future to increase sustainability and energy efficiency for both new construction and existing facilities.

"In addition to applying best engineering practices from the public and private sector to our projects , we are also exploring opportunities to conduct some demonstration projects to advance technology applications to improve existing facilities' energy efficiency and sustainability, and [we are] really focusing on leveraging some of the capabilities of our research laboratories, ERDC [Engineer Research and Development Center] and, in particular, CERL [Construction Engineering Research Laboratory] to be able to support this effort through technology transfer," he said.

Having been a DPW, Slockbower understands the demands of the job. Those demands are made even more challenging by the high operational tempo required to support both overseas contingency operations and the major changes ongoing at installations driven by BRAC and other Army transformation initiatives, he said.

"We truly want to be partners with the DPWs in addressing both the challenges and opportunities they face to operate, sustain, maintain and recapitalize their installations while continuing to meet the daily needs of the Soldiers, families and civilians we all serve," he said.

As both the director of Military Programs and the functional chief representative for CP-18, Slockbower's responsibilities range widely and affect thousands upon thousands of individuals. It's a big job, but Slockbower has the energy for it.

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

From longtime Public Works Digest publisher Don LaRocque

Thirty-five years later and here I am, sitting in an office devoid of wall hangings, a desk almost empty, no maps lying around, a clean white board and boxes waiting by the door. No actions in my in-box, no crisis e-mails, no more money to spend, no more deadlines to meet (or not).

I'm retiring from federal service.

Time would fail me to tell of all the great folks I've worked with since beginning at Red River Army Depot, Texas, as an intern in 1971. That is for another book, but I can honestly say that I've always been blessed with excellent co-workers, bosses and staff. Thank you all so much for working with me.

I really believe we engineers have done, and will continue to do, good things for our Soldiers and their families.

Farewell and *allons y*!

Don LaRocque
June 25, 2010

Don LaRocque retired July 3 as the chief, Public Works Division, Installation Management Command. Gregg Chislett has been named to replace LaRocque. He is expected to report Aug. 15. Al Carroll and Jeff Ward are alternating as acting chief in the interim.

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When fully staffed, the branch will have 16 employees.

"We are the technical folks at the headquarters that the garrisons can come to for assistance relating to buildings and infrastructure," De Jesus said. "I deal with everything related to projects and the execution of projects in the year of execution."

With more staff comes the never-before-available opportunity to do the strategic thinking and planning appropriate at a headquarters. De Jesus and his staff will concentrate on programs to develop DPWs and standardize operations.

One of his goals is to provide a template and business rules for DPWs to follow for obtaining project approvals and funding. At the headquarters level, it should take about one hour to review a project package, he said. But often, key information or elements are missing, causing delays in moving the project forward.

"The new system will provide better ways for DPWs to provide information that is useful at the headquarters for decision making," De Jesus said.

Part of the difficulty, De Jesus said, is that training has not been available. To counteract that problem, the DPW Academy is another effort he is nurturing. The DPW Academy will be part of the IMCOM Academy to be located in San Antonio at the command's new headquarters.

The DPW Academy is starting off with three classes this fiscal year and five next year, De Jesus said. Eventually, it will offer a full curriculum of 30 to 40 courses.

His involvement with the developing academy dovetails with his strong commitment to Career Program 18 Engineers and Scientists. In 2009, De Jesus was named *CP-18 Activity Career Program Manager of the Year*, because of his efforts to foster a world-class work force and lifetime learning. De Jesus strongly believes in the value of keeping current through training.

"Go back to school; a refreshing course is healthy," was his advice to DPWs.

When he visits installations, he often sees a lack of knowledge about how operations should be handled in the current environment, he said. Changes in regulations and policies do not always get to the person who needs to know, and the way things were done 15 or 20 years ago is usually not the way they should be done now.

"Most of the DPW staff is not in tune with what is going on," he said.

De Jesus cited DD Form 1391s as an example. The information required for SRM projects is different from that needed for Military Construction, but DPWs and the U.S. Army Corps of Engineers often prepare them the same way.

The academy is intended to help relieve those situations and others by providing information on better ways to prioritize and refresher courses on the process changes that cause problems for DPW staffs.

"Get back to the basics," De Jesus said, his enthusiasm and can-do spirit much in evidence. "Read and understand the regulations, and, if in doubt, just ask. It is beneficial and will help those of us who have been in the DPW business for 20 or 40 years to go back to training once in a while as technology has definitely changed.

"Get a refresher course. Attend high-level meetings whenever possible. Go out and seek information. Engage!"

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