

Public Works DIGEST

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**This Issue:
Operations,
Maintenance and
Engineering**

Operations,
Maintenance and
Engineering 3

Operations,
Maintenance,
Engineering
Successes 12

Planning and
Construction
Successes 28

Technical
Support 36

Professional
Development 42



Army transportation infrastructure, like this railroad bridge at Fort Leonard Wood, Mo., is routinely evaluated under a centralized program that inspects the Army's 2,051 bridges, 250 dams, 45 airfields, 15 waterfront facilities and 1,168 miles of active railroad track. Pages 8-9

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Address mail to:

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

Telephone: 202-761-0022 DSN 763
e-mail:
editor.pwdigest@usace.army.mil

Gregg Chislett

Chief, *Public Works Division*
Installation Management Command

Mary Beth Thompson

Managing Editor
U.S. Army Corps of Engineers



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Operations, Maintenance and Engineering

- 3 West Point manages large inventory of historic dams, *by Matt Talaber*
- 4 New York District, West Point enjoy close working relationship, *by Col. John R. Boulé II*
- 5 Work classification in a functional conversion, *by William S. Allen Jr. and Mike Dean*
- 7 When 'high performance buildings' are to be renovated, *by Mindy Rosito*
- 8 Army Transportation Infrastructure Program updates, *by Ali Achmar*
- 10 Utility systems and network facilities work classification, *by William S. Allen Jr.*
- 11 News from the General Fund Enterprise Business System world, *by Deb Gonzales*

Operations, Maintenance, Engineering Successes

- 12 Fort Detrick deploys microgrids for better utility security, *by Larry Potter*
- 14 Fort Carson takes on irrigation in pursuit of net-zero water goal, *by Susan C. Galentine*
- 15 Yongsan's In-house Asbestos Removal Team saves time, money, *by Charles Markham and William Rogers*
- 16 Fort Detrick capably manages solid waste, *by Mark Dressler*
- 17 Corps upgrades wastewater aerators at Afghan training center, *by Karla Marshall*
- 18 Fort Bragg Public Works 'All-American Team': Iron Mike, ProdMan, *by Christine Hull, Michael Saylor and Kelly Roscoe*
- 19 Fort Detrick improves numbers with reliability centered maintenance, *by Larry Potter*
- 21 Garrison Hawaii embraces sustainable water, energy practices, *by Hayley Diamond*
- 22 Arlington launches geospatial interment scheduling capability, *by Dan Gardner*
- 23 Corps supports O&M at Joint Regional Afghan National Police Center, *by Mark Ray*
- 25 Fort Bragg Green Boot Program builds sustainability into mission, *by Jonelle Kimbrough*
- 26 Corpus Christi Army Depot makes pedestrians safe with technology, *by Yong S. Choe*
- 27 Fort Wainwright tests night lights for extreme conditions, *by Bill Wood*

Planning and Construction Successes

- 28 West Point's new science center helps Cadets reach for the stars, *by JoAnne Castagna*
- 29 Fort Carson Resiliency Campus: Constructing as a team, *by Joe Wyka*
- 31 Fort Campbell maps the way to a renewable future, *by Rick McCoy*
- 32 At Daegu, master planning in the southeast enduring hub, *by John M. Mathews*
- 34 Fort Belvoir's Pence Gate upgraded, ready for traffic, *by Debra Valine*
- 35 Fort Campbell's chapel complex blessed with options, *by Jon Fleshman*

Technical Support

- 36 Corps is home on the range, *by Monique Ostermann*
- 37 Need to evaluate archaeological sites? Help is here, *by Carey Baxter*
- 38 Bulletin describes actions to achieve water-efficient installations, *by Richard J. Scholze*
- 39 Bulletin offers guidance for monitoring archaeological sites, *by Michael Hargrave*
- 40 Cold-weather, low-emission vinyl coating applied in Alaska, *by Dana Finney*
- 41 Bulletin aids in identifying archeological traits of soils, *by Carl Carlson-Drexler*

Professional Development

- 42 Know your hiring authorities and make them work for you, *by Renee Benjamin and Rekisha White*
- 43 Presentation advice, *by Mary Beth Thompson*
- 43 In memory of Ronald Peter Diehl



West Point manages large inventory of historic dams

by Matt Talaber

The U.S. Military Academy at West Point, N.Y., is home to 10 percent of the Army's dams. Maintaining all 22 dams involves a continuous cycle of monitoring, inspection and repair. Beyond the physical care required, emergency planning for the sizable dams found in the West Point dam inventory is requisite.

Monitoring

A single project manager is charged with ownership of the dam program. The project manager retains visibility of the entire inventory.

It is important that the dam project manager retains overarching visibility of all dam repairs even if the repairs are managed by other individuals. The dam project manager is West Point's link to the other agencies that have a role in dam maintenance and repair and in emergency preparedness.

Monitoring is also a community responsibility. "High hazard" and "significant hazard" dams have been posted with signage in close proximity that indicates the dam name, the location and the contact numbers. Although not technically trained in most cases, local community members are capable of noticing changed conditions, and their insight is part of the formula for ensuring dam safety.



Matt Talaber
Photo by E. Campbell

Inspection

The Corps of Engineers is West Point's principle dam inspection agency. The Corps brings a wealth of experience to dam management. The New York District, in particular, includes several well versed experts accomplished at dam inspection. In addition, the district has access to industry experts who can assist with every aspect of dam inspection from diving to wall construction.

The dam project manager assures annual and periodic dam inspections are conducted, in particular during and after significant rainfall events. The project manager identifies and prioritizes repairs. Afterward, the Work Management Board assigns the repairs to the appropriate entity for execution, and actual repairs are inspected by the project manager. Again, keeping the project manager involved throughout the process ensures consistency of repair across the entire inventory of dams.

Repair

Repairs of West Point's dams occur in many forms, because there is such a variety of dam structures.

For example, the Mine Lake Dam, built in 1846, is a 505-foot curving

Acronyms and Abbreviations

DPW	Directorate of Public Works
SHPO	State Historic Preservation Office

dam constructed of local stones with a 10- to 12-foot thickness at the base tapering to a 6- to 8-foot dimension at the top. The repair design was 90 percent complete when Tropical Storm Irene arrived in August 2011. The entire 505-foot length was topped by a rush of water for several hours.

The dam was monitored during the event for signs of failure. Inspection after the event revealed that the footing — made visible due to erosion — was constructed differently than originally thought. This finding has led to a redesign.

The Stillwell Dam is a 57.3-foot high concrete structure built in 1948, the youngest dam in West Point's inventory; the average dam age is 96 years. Recent repairs to this dam include: cleaning the relief wells, dive inspection of the low level drain line, and repair and exercise of the valves.

A gallery inside the base of the dam allows personnel to walk the entire length of the dam to inspect for clogged relief wells and signs of structural failure. Built on a seismic fault line, structural inspections of this dam are in-depth.

When repairing historic dams, Section 106 of the National Historic Preservation Act of 1966 applies as it would with any historic structure. Consultation with the State Historic Preservation Office is



The 1846 Mine Lake Dam is topped during Tropical Storm Irene.
Photo by T. Coughlin



Stillwell Dam, a placed concrete structure, has a gallery at the base that allows inspectors to walk the entire length of the dam's interior.
Photo by T. Coughlin



New York District, West Point enjoy close working relationship

by Col. John R. Boulé II

The U.S. Army Corps of Engineers and the U.S. Military Academy at West Point, N.Y., have been proudly linked since West Point was first manned as fortifications during the Revolutionary War and especially since Thomas Jefferson established it as America's military academy and the nation's first engineering college in 1802.

Today, the New York District of the U.S. Army Corps of Engineers, which I have the privilege of commanding, works closely with the dedicated Soldiers and Civilians who operate and maintain West Point on efforts ranging from the recent large-scale vertical construction projects like the new library or the U.S. Military Academy Preparatory School to carrying out restoration or maintenance work on



Col. John R. Boulé II
Photo courtesy of U.S. Army Corps of Engineers

existing structures like Michie Stadium or dams on the installation. And all of this work is done with a mind toward sustainability — not only because it's the right thing to do but because West Point is

Acronyms and Abbreviations	
IPR	in-progress review
SRM	Sustainment, Restoration and Modernization

a pilot installation for the Army's Net-Zero Program. Participation in that program means the installation is aspiring to use only as much energy as it can produce itself each year, by the year 2020.

Close partnership and collaboration with our teammates at West Point in offices like the Directorate of Public Works are crucial to the success of all of these projects and everything in between that the Corps of Engineers carries out at West Point.

The Corps of Engineers exercises three levels of partnering with our teammates at West Point. The first

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required. Because New York state is home to hundreds of historic dams, the SHPO brings a great deal of knowledge to the repair process and has been instrumental in helping West Point find culturally acceptable repairs for several dams over the past decade.

In addition, our Directorate of Public Works has developed notable in-house dam repair expertise. With relatively little training, trade experts learn the intricacies of dam repair. Training is available through the Corps of Engineers that can quickly teach trade professionals the skills required to make a variety of small repairs. Recently, West Point masons repointed sections of the 1895 Lusk Reservoir Dam with mortar designed to match the color and properties of the original mortar.

Emergency planning

Of West Point's 22 dams, five are considered "high hazard" and two "significant hazard" dams. The high hazard classification means that the dam's failure would result in certain loss of life, disruption of life lines, extensive property loss and extensive environmental impacts.

The significant hazard classification means the dam's failure would result in uncertain loss of life in a location that is usually rural, disruption of essential life lines, major property loss and major environmental impacts.

In West Point's case, failure of any of our high and significant hazard dams could result in loss of life for anyone in the path of the water surge. Consequently, the development of emergency action plans is imperative.

Emergency action plan development requires the involvement of all agencies that may play a role in emergency response and recovery. As an example, if the Lake Frederick dam were to fail, the water surge would damage West Point property, adjacent village and town properties and force the closure of the New York State Thruway. Emergency planning incorporates all related agencies.

Planning workshops allow for confirmation of points of contact and phone numbers, accumulation of response assets, chains of command depending on location, establishment of a library of plans and other documents.

Once the action plans are completed,

the next step is to hold a planning exercise. The planning exercise replicates an emergency event. All participate in the mock emergency in accordance with the action plans.

The last step is the after action report. Comments are incorporated in action plans, which are then considered final and distributed to all participants.

Prime resources for dam planning exercises are the Corps' New York and Philadelphia districts. The West Point DPW also has access to the Engineering Resource and Development Center's Waterways Experiment Station in Vicksburg, Miss.

Maintaining an expansive inventory of historic dams can be challenging. Through constant monitoring, careful inspection and targeted repairs of the dams, we can remain operational and safe. And a well-thought-out emergency action plan that is exercised periodically is essential to prepare for the unlikely event of a dam failure.

Matt Talaber is the director of Public Works, U.S. Military Academy, West Point, N.Y. 🇺🇸



Work classification in a functional conversion

by William S. Allen Jr. and Mike Dean

One of a commander's most challenging tasks is to ensure proper utilization of the installation's real property. To find space for new units, a commander may direct the director of Public Works to prepare unused facilities for their use. Since the facility category code system is based on how the real property is used, the commander's directive may cause a CATCD change.

This change may or may not be a problem depending on the facility's configuration and how the CATCD changes.

If one of the first three digits of the CATCD changes, the DPW would probably need to have the building converted to the new use. Changing a facility from one use to another use is one of the more complex administrative tasks of the DPW's job, because the change

Acronyms and Abbreviations	
CATCD	category code
DA Pam	Department of Army Pamphlet
DPW	Directorate of Public Works
EIP	equipment in place

involves the law — U.S. Code Title 10 § 2801, § 2802 and §2805 — and because many Army regulations dictate who has the authority to convert different types

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type is partnership on the individual project level with project delivery team members for larger projects working in regular coordination with the necessary counterparts at West Point.

The second level of partnering is done on a regular monthly level through in-progress review meetings where members of my staff discuss bigger picture and longer term issues with their counterparts. The topics range from current large-scale projects to Facilities Sustainment, Restoration and Modernization work to early discussions for projects scheduled years down the road.

The Corps and West Point also conduct senior IPR meetings, the third partnering tier, on a quarterly to semiannual basis. The West Point garrison commander and I attend these IPRs, and sometimes the dean, commandant, superintendent or their representatives attend as well to discuss issues or projects important to them. The monthly and senior IPRs are the kind of regular, close coordination that reaps great rewards as we work together to maintain and build West Point for future generations of our nation's leaders.

A big part of making sure West Point remains the top notch installation it is for Cadets, faculty, staff and their Families who work and live there is the SRM program I mentioned earlier. Through the SRM program, the staff at West Point is able to do repairs and upgrades on

existing facilities or structures, enlisting the capabilities of the U.S. Army Corps of Engineers for some of the larger, more complex projects under the Military Construction cap. These projects are included in the monthly IPRs and discussed at length. SRM projects on the horizon include exterior repairs to the Cadet chapel and projects to repair dams on the installation.

Speaking of dams, the close relationship with the garrison staff translates from construction and maintenance work to readiness and emergency response through the Dam Safety Program that has been in place since 2003. West Point is home to about 10 percent of all Army dams, most of which contribute to the garrison's water supply system. Several dams at West Point hold back tens of millions of gallons of water, and it's critical that these dams are inspected and maintained regularly, which is why the Corps of Engineers partners with West Point on the Dam Safety Program. *(Editor's note: For more on West Point dams, see the article on page 3.)*

These partnerships are all intertwined to create the best possible environment to get the job done for the installation. In fact, earlier this year through the SRM program, the Corps of Engineers awarded a nearly \$1 million contract for the renovation of the dam at Lusk Reservoir, which, as any West Point Cadet is required to know, holds back 78 million gallons of water when water is flowing over the spillway. That's a lot of

water, and the renovation work will help maintain the integrity of the 117-year-old dam, ensuring those 78 million gallons don't wreak havoc on portions of the installation or nearby communities.

The Corps of Engineers also works with West Point on emergency preparedness exercises, planning and practicing responses to potential disasters. This preparation not only improves readiness for both the Corps of Engineers and the installation, but it continues to build and develop the relationships between the Corps and our partners at West Point.

These exercises went live last year when Tropical Storm Irene made its way through New York. Corps of Engineers personnel worked seamlessly with the great emergency management professionals at the installation to manage without incident the demands that nearly unprecedented amounts of water brought to the water infrastructure.

That event was just one of the many examples of how our regular, collaborative partnership with West Point has been paying dividends. We're proud of what we've been able to accomplish for the academy working with our partners at the garrison and look forward to continuing to collaborate with them on everything from ongoing maintenance and repairs to major Military Construction projects.

Col. John R. Boulé II is the commander, New York District, U.S. Army Corps of Engineers.





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of facilities.

The DPW has to keep in mind that a conversion from one use to another usually has two parts — an administrative part that changes the real property records and an engineering part that makes physical changes to the facility so that it may be used for its new purpose. When the authority to convert the facility has been received and the real property records have been changed to reflect the new use, the DPW can start work to provide a respectable working facility for the new occupant.

During the planning stages of the engineering effort, the DPW must keep three concepts in mind. First, by law, conversion is construction. The work to modify the facility caused by the change in the building's utilization is classified as "construction."

Second, in converting a facility, the maintenance and repair work that would have been required regardless of its functional use is still classified as "maintenance and repair," according to DA Pamphlet 420-11, *Project Definition and Work Classification*, paragraph 2-2.c(d). The functional conversion does not change the condition of the facility.

Last, placing a new tenant in a facility may require the installation of special equipment that the tenant needs to perform its mission, referred to as "equipment-in-place." Installation of EIP in an existing building is considered an equipment cost and is not figured into either the construction cost or the repair costs. DA Pam 420-11, paragraph 2-8.d, provides guidance on installation of equipment in existing buildings.

The only cost that is attributable to the conversion construction project is the work necessary to make the building function in its new use.

The appropriation that funds the conversion is determined by the cost of

the modifications needed for the building to function in its new use. If the building functions in its new use without modifications, then the DPW probably has a no-cost conversion. If the costs for modifications are less than \$750,000, the conversion can be funded with Operations and Maintenance funds. Modifications that cost more than \$750,000 are funded by either Unspecified Minor Construction funds or Major Construction funds.

For example, when converting a general purpose administrative building, CATCD 61050, to an access control building, CATCD 14113, it is possible that no cost will be incurred as most of the functions to be performed in the access control building are administrative in nature.

In this example, if the roof needed repairs when the building was a general administrative building, it will still need to be repaired for the new use. Prior to the conversion, if the interior of the building needed to be repaired, it may be repaired after the conversion. If walls were to be removed for the repair and they are not needed in the new use, those walls do not need to be replaced. In addition, replacing the walls in locations that would allow the space to function more effectively may take the new use into consideration if the new arrangement would have worked in the old use.

This reasoning is in line with the "Definition of Repair" published in 1997, which is still used. DA Pam 420-11 paragraph 1-6.a(1) says, "Interior rearrangement (except for load-bearing walls) and restoration of an existing facility to allow for effective use of existing space or to meet current building code requirements (for example accessibility, health, safety, or environmental) may be included as repair."

However, if the interior was not in need of repair, any wall rearrangement would be a construction cost. Since the utility




A former WWII hangar at Conn Barracks, Germany, underwent conversion and has functioned as a gym for almost 60 years. Photo courtesy of William S. Allen Jr.

systems are generally hidden within the walls, work on these hidden systems will have the same characteristics as work on the wall. In addition, if the new use requires an arms vault to store guard weapons, a portable vault can be installed as EIP and affixed to the building by bolting it to the floor or walls.

In conclusion, work classification during conversion of a facility can be considered a two-part process. First, look at the facility as the CATCD it is before conversion. Determine what repairs are needed to bring the facility up to codes and standards. That work is considered "repair." Second, look at the facility as the CATCD to which it is to be converted. Any additional work needed to make the facility functional under the new CATCD is considered "construction."

For more information on conversions, go online to DA Pam 420-11 at http://armypubs.army.mil/epubs/pdf/p420_11.pdf and word search on "conversion."

POC is William S. Allen Jr., DSN 314-370-6540, bill.allen@us.army.mil.

William S. Allen Jr. is the Public Works business manager, Europe Region, Installation Management Command; and Mike Dean is the proponent for work classification, Office of the Assistant Chief of Staff for Installation Management. 



When 'high performance buildings' are to be renovated

by Mindy Rosito

The many rules, regulations and guidance make it difficult to know what to follow when it comes to repairing an existing high performance, green building. A new handbook, expected out this summer, will help installations find the way through the many rules and requirements for major renovations of "high performance buildings." In the meantime, some background information may help those planning such projects.

Definitions

The Army uses the HPB definition found in the 2006 *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding* signed by 19 federal agencies.

The Energy Independence and Security Act of 2007 defines an HPB as, "A building that integrates and optimizes on a lifecycle basis all major high performance attributes, including energy [and water] conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations."

The bottomline is that, for federally owned buildings, it is important to build and manage HPBs to ensure cost effectiveness and quality throughout the life of the buildings.

HPBs start with American Society of Heating, Refrigerating and Air



Mindy Rosito
Photo by Tom Uncles

Conditioning Engineers Standard 189.1. ASHRAE Standard 189.1 is an enforceable code and a minimum compliance requirement for high performance buildings, except in low-rise residential buildings. If your building meets ASHRAE 189.1, it may be considered an HPB.

This standard is written for inclusion in applicable building codes. It is not a design guide, nor is it a rating system.

Guidelines

The policy on comprehensive building renovations used by the Office of the Assistant Chief of Staff for Installation Management is found in a memorandum of understanding dated Oct. 27, 2010, signed by Assistant Secretary of the Army for Installations, Energy and Environment Katherine Hammack. This document

defines a comprehensive building renovation as, "changes to a building's envelope, infrastructure, equipment, and systems that provide significant opportunities for substantial improvement in the sustainable design elements of the building, including energy efficiency."

This guidance states that, starting in fiscal 2013, all comprehensive building renovations

Acronyms and Abbreviations	
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
HPB	high performance building
IMCOM	Installation Management Command
LEED	Leadership in Energy and Environmental Design

will achieve Green Building Certification Institute certification at the Leadership in Energy and Environmental Design – New Construction/Major Renovations Silver level or higher and follow guidance detailed in ASHRAE 189.1.

Challenges

Every project must conduct a life-cycle cost analysis, because the Energy Policy Act of 2005 requires that sustainable measures are followed as long as they are life-cycle cost effective. When it is determined that any or all sustainable measures cannot be followed, a solid justification must be prepared and filed for audit purposes.

For projects that are not comprehensive building renovations, the project managers, or those acting in the capacity as a project manager but ultimately the Directorate of Public Works, must maximize the LEED credits for those projects. The projects are not exempt from meeting all achievable measures.

Handbook

Installation Management Command G4, Facilities Management Branch, is drafting a high performance building handbook. This handbook will serve as a guide to installations. It will provide a step-by-step process for following the most recent guidance for sustainability in major repair projects. The target for publication is this summer.

POC is Mindy Rosito, 210-466-0451, mindy.j.rosito@us.army.mil.

Mindy Rosito is a general engineer, Facilities Management Branch, Public Works Division, Headquarters IMCOM. 



While a high performance IMCOM building at Fort Sam Houston, Texas, is under construction, two of the surrounding buildings (top left and bottom right) undergo major renovation to become HPBs. Photo courtesy of U.S. Army Corps of Engineers



Army Transportation Infrastructure Program updates

by Ali Achmar

The Army Transportation Infrastructure Program provides inspection and evaluation for 2,051 bridges, 250 dams, 45 Army airfields, 15 waterfront facilities and 1,168 miles of active railroad track, including technical support, training, certification and research projects related to the inspection. The ATIP annual budget is \$9-10 million.

The program

Transportation infrastructure facilities are inspected based on established cycles. Bridges are inspected every two years, by law; dams every four years, by law; railroad tracks every four years; airfield pavements every four or five years, based on the U.S. Army Aeronautic Support Agency classification of critical category I or II; and waterfront facilities every four years, by Army regulation.

By the end of this calendar year, Installation Management Command will have inspected 951 bridges, 45 dams, 213 miles of active railroad tracks, nine airfield pavements and 16,439 feet of waterfront berthing.



Ali Achmar
Photo by Michael Andres

The ATIP program also provided four training classes this year. Thirty-three students took the Railroad Track Inspectors Course. Twenty attended the Bridge Safety Inspectors Course. Nineteen took the Dams Safety Inspectors Course, and 32 attended the Army Airfield Pavement Repairs Course.

In addition, IMCOM is implementing PAVER for about 28.5 million square yards of roads in the cantonment areas on 10 garrisons.

Acronyms and Abbreviations	
ATIP	Army Transportation Infrastructure Program
FY	fiscal year
IMCOM	Installation Management Command

The budget

The ATIP budget for FY 2011 increased from \$8.75 million to \$9 million due to an addition to the transportation facilities inventory of 24 bridges, 20 dams and 17,000 feet of berthing. The projected budget for FY 2013 is \$9-10 million due to the addition of 20 dams and the PAVER implementation.

In addition, \$3 million under the RJT9 Management Decision Package account known as "Strategic Mobility" funded an airfield pavement repair project at Fort Drum, N.Y.

This account funds projects that were identified to support key power projection platforms and power generation platforms, and to enhance capability at rail heads, airfields designated as aerial ports of embarkation, container yards or deployment processing facilities. The projects must support Army Force



The Army's waterfront facilities, such as found at Fort McNair, Va., are inspected every four years by regulation. Photo by Kevin Haskins



By law, bridges in the Army inventory, such as this Fort Hood, Texas, bridge, are inspected every two years. Photo by Gerardo Valazquez



Army dams like the Ketch Dam at Fort Sill, Okla., are inspected every four years. Photo by Gustavo Galan-Comas

Each Army airfield, like Gray Army Airfield, Wash., is inspected every four or five years depending on its critical category. Photo by Andrew Harrison

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Generation, Global Defense Posture Realignment, Base Realignment and Closure or Army Modular Force initiatives or other emerging strategies that impact IMCOM's ability to ensure rapid deployment capability at installations.

Additional funds of \$6 million are expected before the end of FY 2012.

The results

FY 2011 inspections yielded these results:

- bridges – 83 critical deficiencies totaling \$8 million in repairs,
- dams – nine critical deficiencies for about \$500,000 in repairs,
- airfield pavements – \$33 million in major repairs,
- railroad tracks – 180 miles closed to traffic or operation requiring about \$250,000 in repairs, and
- waterfront facilities – 10 critical findings for roughly \$100 million in repairs.


All critical deficiencies were reported to the garrison commanders or managers for immediate repairs in FY 2012. For all noncritical deficiencies, the estimated sustainment and repair cost is \$211 million.

Centralizing and managing the ATIP at Headquarters IMCOM ensures that public laws and Army regulations are met across the board.

Centralization also makes for efficiency in saving the Army's resources and for consistency in the evaluation of and

condition reporting for the Army's transportation infrastructure.

POC is Ali Achmar, 210-466-0458, ali.achmar.civ@mail.mil.

Ali Achmar is the program manager, ATIP, Headquarters IMCOM. 



Railroad infrastructure, like these tracks at Fort Carson, Colo., is inspected every four years. Photo by Mike Crawford



Utility systems and network facilities work classification

by William S. Allen Jr.

The first step in work classification is determining the facility, system and network on which you are working. Classifying systems and networks for work purposes is a bit confusing to more than a few people. The confusion exists because a system or a network can be composed of more than one facility.

Luckily, there are only a few real property systems or networks, and the work classification rules governing systems and networks do not follow the general rule that complete replacement of a real property facility is construction. For work classification purposes, the entire system or network is considered as a composite facility. This situation means that it may take several real property facilities to make up a system or a network, in addition to a number of other components needed within the context of a whole system or network, to satisfy a documented requirement.

Utilities are the most prevalent systems with which the Directorate of Public Works deals, and these systems are partly defined in U.S. Code, Title 10, §2688, Utilities. This section defines these utilities:

- electric power – a system for the generation and supply of electric power;
- drinking water – a system for the treatment or supply of water;
- wastewater – a system for the collection or treatment of wastewater;
- steam, hot water and chilled water – a system for the generation or supply of steam, hot water and chilled water.

These systems also include: equipment, fixtures, structures and other improvements used in connection with a system as well as the real property, easements and rights-of-way associated with the system.

Based on these examples, a refueling station and a tank farm can also be considered systems. A potable water system can include several category codes, or CATCDs: 84110 Water Treatment Plant; 84130 Water Well, Potable; 84210 Water



William S. Allen Jr.
Courtesy photo

Distribution Lines, Potable; and 84610 Water Storage Tank, Potable; plus the pumps and extra items needed to make the system work. The same is true of an electrical system. It consists of CATCDs 811XX Power Generation Facility; 812XX Electrical Transmission and Distributions Lines; and 813XX Electrical Power Substations and Switching Stations.

If a water tank, CATCD 84610, fails, it can be completely replaced as “repair.” The same is true of an electrical substation, CATCD 81320. The key is that each of the facilities making up the system is needed to make system work. Remove any facility in the system, and the whole system fails.

Networks follow the same logic. Road networks and airfield pavements are the two major networks with which the DPW deals. These linear real property facilities — roads, streets, walks and parking areas — are grouped into the facilities that reflect their construction. These facilities include the signs; signals; safety barriers, excluding active vehicle barriers; bridges; and other appurtenances necessary for a safe, efficient road, sidewalk or park.

When calculating the replacement facility cost for surfaced areas, all contiguous airfield pavements, i.e., runways, taxiways, aprons within CATCD 110, are considered to be a single real property facility, for example. The airfield pavement facility includes all signs, lights, signals and other appurtenances necessary

Acronyms and Abbreviations	
CATCD	category code
DPW	Director (Department) of Public Works

for safe and efficient airfield operations.

The same is true for roads. Appurtenances are part of the road system. They are placed as necessary to provide safe, effective traffic flow. When roads are repaired, if a signal light is necessary to provide proper traffic control and it does not exist, it can be added during the repair as part of the repair project. The same is true of a turn lane at an intersection. If a turn lane is necessary to provide proper, safe traffic control and flow, it can be added as part of the repair project even though it did not previously exist.

DA Pamphlet 420-11, paragraph 2-2.a.(2), contains many examples of what can and cannot be done as part of a road or airfield repair. For example, subparagraph (u), *Repair of failed or failing roads at the entrance to an installation*, may include increasing the base data of surfaced areas, such as widening, extending and enlarging to accommodate additional lanes for parking, turning and holding areas as well as appurtenances, rails and traffic signs and signals necessary to provide proper traffic control and access to an installation that meets force protection and anti-terrorism standards. In this case, placement of active vehicle barriers would be done as equipment-in-place owned by the provost marshal.

To slightly misquote Aristotle, the whole is the sum of its parts for work classification purposes. If the whole needs a part to make it function properly, then that part, even if it seems like a separate item, is included in the whole.

POC is William S. Allen Jr., DSN 314-370-6540, bill.allen@us.army.mil.

William S. Allen Jr. is the Public Works business manager, Europe Region, Installation Management Command. 🇺🇸



News from the General Fund Enterprise Business System world

by Deb Gonzales

The latest enhancement to the Army's General Fund Enterprise Business System suite is the release of a companion application called "Collaborative Projects," or "cProjects," that provides a web-based application integrally linked with GFEBs to perform full work management functions. The Directorate of Public Works community will use cProjects as the repository of all requests for work, i.e., DA Form 4283s.

Once a project is entered into cProjects, the DPW can manage the vetting and approval process at the garrison, capture estimates at the Element of Resource level, and log and track the progress of the work. When the project is approved and funded, it will be flagged for replication in the GFEBs Project System module, which captures the financial transactions associated with work accomplishment.

How cProjects works

As in the GFEBs Project Systems module, the highest level in the project hierarchy is the "Project Definition." The Project Definition provides the detailed description of the project.

The second level in the hierarchy is called "Phases." The Phases level documents the linear progression of accomplishment. Phases can be identified



Deb Gonzales
Photo by Mary Beth Thompson

as items that need approval before progression to the next phase is permitted.

The next level in the hierarchy is "Tasks" or "Checklists." Tasks are the items of work that make up the phase and have full scheduling capabilities. Checklists are lists of items that need to be accomplished but have no scheduling parameters. Both task and checklist items can be identified as work to be completed before progressing to the next phase.

If you are beginning to think that cProjects is very similar to Microsoft Project, you are right. In fact, the data from cProjects can be exported to Microsoft Project, and, similar to Microsoft Project, you can graphically display and update data via a Gantt chart.

cProject roles

Each project will have a project lead who will be responsible for planning the phases, tasks and checklists as well as identifying the project roles needed to accomplish them. When the roles are established, the project lead will assign individuals to those roles.

Acronyms and Abbreviations	
DPW	Directorate of Public Works
GFEBs	General Fund Enterprise Business System
IMCOM	Installation Management Command

In cProjects, those individuals are called "business partners."

After the roles and assignments have been made, e-mails are sent to the responsible business partners notifying them that tasks have been assigned to them. When the task or checklist has been completed, the status of the task or checklist is updated. The status of all phases, tasks and checklists are visible to all business partners who have been given permission to view the project.

Making cProjects perform

To effectively use cProjects, garrison DPWs must first document their business processes for receiving, planning and executing work. When they understand their business processes and have defined their standard structures, they can create project templates to reflect that structure. Use of templates will shorten the time required to build the garrison's projects.

The Headquarter Installation Management Command goal is to use cProjects as the repository for all work requirements. It expects the garrisons to use the cost-estimating capabilities of cProjects and the GFEBs Project Systems module to identify all costs associated with accomplishing the DPW mission, i.e., the annual work plan. An annual work plan report is being developed in GFEBs Business Intelligence and is expected to be available in time for the fiscal 2014 submissions.

Headquarters IMCOM is also working toward pulling reports from cProjects to feed data to the Project Prioritization System for racking and stacking projects at the headquarters level. Currently, the projects must be individually entered into the Project Prioritization System and into the garrison's project management tool. ➤

Roles	Permissions
cProjects Report Reviewer - [org]	Role has access to view projects and evaluations of projects. Role does not provide BI reporting access.
cProjects Member - [org]	Role has access to edit existing project information (project, phase, task, checklist items, doc attachments). Role cannot create projects.
cProjects Approver - [org]	Role has access to grant phase approvals and to view projects and evaluations of projects.
cProjects Lead - [org]	Role has access to all cProjects functionality except template and user group maintenance. Role can create projects, add/delete project elements and edit project information.
cProjects Template Administrator - [org]	Role has access to maintain templates (project, checklist, document) and maintain user groups (e.g., to be assigned within projects to control project specific authorizations).

This table spells out the roles and corresponding permissions in cProjects. Graphic courtesy of Deb Gonzales



Fort Detrick deploys microgrids for better utility security

by Larry Potter

The utility infrastructure requirements for Fort Detrick, Md., are dramatically changing with the growth of the National Interagency Bio-defense Campus, the emergence of the central utility plant and the construction of new facilities for the Department of Defense communication mission. The importance of providing electrical power that can be isolated from the national grid is increasing with the potential for cyber attacks and the overload of the grid. The use of microgrids is becoming popular and actually an imperative to protect critical national assets dealing with research and communications.

Fort Detrick has two microgrids, the central utility plant and the existing power plant.

Microgrids

What is a microgrid? Berkeley Lab scientists are helping to develop a new

approach to power generation in which a cluster of small, on-site generators serves office buildings, industrial parks and homes. Called a microgrid, the system could help shoulder the nation's growing thirst for electricity — estimated to jump by almost 400 gigawatts by 2025 — without overburdening aging transmission lines or building the 1,000 power plants required to meet this demand.

Microgrids may make statewide blackouts a thing of the past or, at least, ensure that service to critical equipment is maintained. The microgrid offers a means of isolating a group of loads from the national electrical grid, reducing demand on the grid, protecting the group of loads from blackouts and providing a much more reliable electrical service.

One of Fort Detrick's microgrids serves the research mission, and the other serves the communications mission. Both

microgrids are made up of a series of generators serving a group of facilities with a common mission. Both allow the isolation of the electrical service to the facilities from the national electrical grid and can operate in island mode for extended periods of time, providing highly reliable electrical service.

Electrical system

FirstEnergy Potomac Edison Company provides electric service to Fort Detrick through two 34.5 kV service feeders. Both feeders enter Fort Detrick along utility rights-of-way, and service is distributed to seven substations scattered throughout the installation. The installation's peak demand load is about 37,000 kVa. The 34.5 kV subtransmission system has a capacity of 50,000 kVa, which should carry the installation into 2025.

Two of the seven substations on the Fort Detrick system are single-ended ➤

(continued from previous page)

The intent is to stop the need for dual entry of project data.

Using cProjects will also provide an enterprise project management tool that will eliminate a garrison's need to purchase and maintain a site-specific work management tool.

cProject security

Access to cProjects is provided through the existing GFEBS portal using the same sign-on credentials as are used to access GFEBS. The garrison must request the appropriate roles for its staffs through the governance, risk management and compliance provisioning process currently used to receive any GFEBS or GFEBS Business Intelligence roles. The acquisition of these roles is the first tier of security provided in cProjects.

The second tier of security is provided at the project level. The project administrator has the ability to assign specific read or write capabilities to

individuals. This second tier of security is managed at the garrison level, not through governance, risk management and compliance provisioning.

cProject training

Headquarters IMCOM is working closely with the GFEBS team to develop training aids and instructor-led classes. The pilot class for IMCOM DPWs will be conducted at Fort Sam Houston, Texas, Aug, 13-17.

The intent is to conduct enough classes to accommodate the training of at least one person per garrison with the expectation that the individual will be able to go back to the garrison and help train the rest of the staff. Online sessions will also be conducted to supplement the instructor-led training.


Group effort

The creation of cProjects for DPWs was an extensive collaboration of the GFEBS Plant Property and Equipment Project Systems Tiger Team and

personnel from garrison DPWs, IMCOM regions and headquarters. Fort Bragg, N.C., hosted workshops and allowed the group to use its extensive project review business process documentation as a springboard for discussions.

Workshop participants came from Fort Bragg, Fort Wainwright, Alaska; Fort Riley, Kan.; Fort Hood, Texas; White Sands Missile Range, N.M.; Joint Base Myer Henderson Hall, Va.; and Fort Jackson, S.C. These participants provided real world insight into the DPW's work management needs. Without their participation and their management's willingness to allow their participation, the release of cProjects would not have been possible.

POC is Deb Gonzales, 210-466-0615, deborah.p.gonzales.civ@mail.mil.

Deb Gonzales is the Information Technology Team lead, Business Operations Branch, Public Works Division, Headquarters IMCOM. 



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distribution containing only a single transformer. Loss of one transformer or associated breaker or feeder will result in a loss of power downstream of the substation. This reliability issue is overcome by providing every feeder on the installation with a backup feeder from another substation. The remaining five substations contain two transformers, providing additional redundancy.

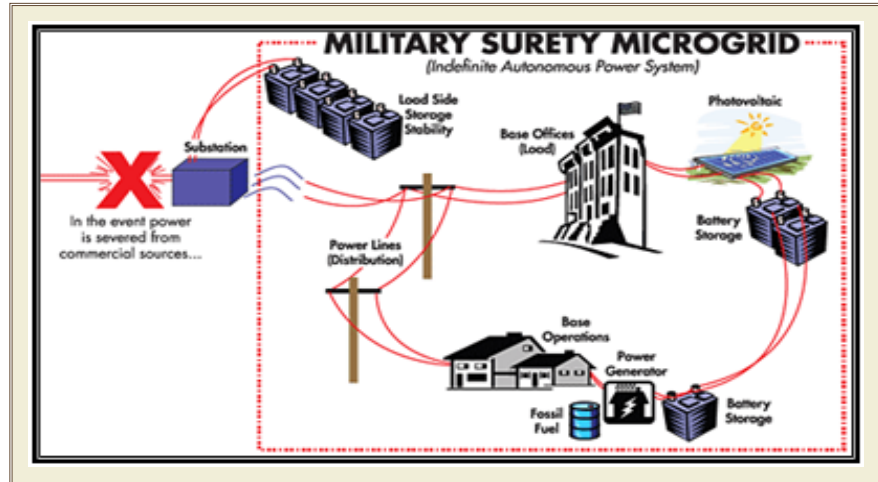
Three substations have been upgraded to meet all the new standards. Each substation's capacity is 15,000 kVa or 20,000 kVa. One of the substations was designed and constructed before the central utility plant was proposed, and it can handle all the loads in the high development end of the installation. Fort Detrick has also adopted a policy of putting all new electric lines underground and replacing overhead wires with underground lines where cost effective.

Generator plant

The existing generator power plant is a semi-smart microgrid that feeds the critical communication mission at Fort Detrick. The power plant has four 2,500 kVa generators that can run in parallel with the commercial grid or can run isolated from the commercial grid to protect the communication loads from the commercial grid.

The power plant is manned 24/7. The semi-smart microgrid is manually connected and disconnected from the commercial grid. When the microgrid is isolated, the electronic load-sharing generator governors maintain 60 cycles, and the electronic regulators maintain the voltage. The plant is operated with n+1 generators on line at all times so that one can drop off and the remaining generators can carry the load without degradation of service to the communication mission.

The output from the generators is 4.16 kV, and that voltage is distributed to the critical mission loads where it is



Microgrids provide electrical power that can be isolated from the national commercial grid, Graphic courtesy of Fort Detrick

stepped down to the utilization voltage. Each feeder is protected with 4.16 kV breakers with overcurrent, undervoltage and other relaying. Load shedding can be accomplished manually by each mission partner.

The generators are diesel driven, and fuel storage can support an extended emergency.

Central utility plant

The central utility plant is a privately developed plant that provides conditioned electric power, chilled water and steam. The plant is owned and operated by Keenan Fort Detrick Energy LLC.


The central utility plant is an Enhanced Use Lease project, and the developer was chosen through competition by the Corps of Engineers' Baltimore District. The very strict standards for service were determined by the critical mission loads that it serves. The reliability of the conditioned electric service is 99.999 percent (five nines), and the chilled water and steam are 99.99 percent (four nines).

The central utility plant microgrid is a three-wire, low-resistance, grounded, wye-connected system. The facility ensures that the service entrance switchgear is designed for this type of service, including potential transformers, surge arresters and

insulated cabling.

The plant provides electrical service through large motor generator sets. The motor generator sets are normally on line, and the large flywheel provides ride-through capability when the grid goes down until the diesel generators come on and provide continuous electrical service. This setup provides highly reliable service to the customers without electrical interruption to critical research missions.

POC is Larry Potter, 301-619-2441, larry.potter@us.army.mil.

Larry Potter is director of Public Works, Fort Detrick. 

Call for ARTICLES

The October/November/
December 2012
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Energy, Water and Waste

Deadline is Sept. 12

Submit articles to
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Fort Carson takes on irrigation in pursuit of net-zero water goal

by Susan C. Galentine

Irrigating Fort Carson’s numerous athletic fields, parade fields and other landscaped areas in Colorado’s semi-arid climate is a costly proposition. Add in that the installation is trying to achieve net-zero water by 2020, and the use of the scarce resource becomes even more challenging.

Fort Carson, one of two triple net-zero Army installations for water, energy and waste, is taking a holistic approach to reducing water used for irrigation. Pursuing net-zero water means the installation is reducing the use of fresh water and will maximize the use of reclaimed water.

The first step, learning about the installation’s overall water use breakdown, came through a Department of Energy water balance assessment conducted by the Pacific Northwest National Laboratory December through March. The study found irrigation created the most demand, comprising 56 percent of the total annual potable water used.

“A water balance provides information on the predominant water users so that water consumption can be well understood and efficiency improvements can be prioritized to help Fort Carson meet the water reduction goals under the Army’s Net-Zero Water initiative,” explained Kate McMordie Stoughton, a PNNL water efficiency engineer.

Several irrigation reduction initiatives are currently under way at Fort Carson. The U.S. Army Corps of Engineers’ Omaha District is working on a multiphase, \$10 million reclaimed water system expansion for the post. Fort Carson’s Cheyenne Shadows Golf Course has irrigated using reclaimed water from the installation’s wastewater treatment plant since the 1970s, and other areas including Iron Horse Park,

the sports complex, Pershing Field and Founders Parade Field will transition to reclaimed water within the next several years.

The desired outcome is to use all of Fort Carson’s wastewater in priority landscaped areas, said Donald Chong, one of the Omaha District project engineers heading the water system expansion. That work will entail upgrading four miles of existing pipe and laying 19 miles of new lines to the system along with adding new pumps at the sewage treatment plant pumping station. When completed, the system will increase from pumping 500 gallons per minute to up to 3,200 gallons per minute to accommodate the increased demand.

“This is a great project — one to three million gallons per day of reclaimed water will be used for irrigation instead of using drinking water,” said Chong.

The Directorate of Public Works has been reducing potable water use on the installation by reducing the amount of green space on the post, adding low-flow and no-flow plumbing fixtures and smart irrigation system. This project offers another way to conserve water, Chong said.

Upgrading and expanding the reclaimed water system will reduce Fort Carson’s total drinking water use by roughly 200 million gallons per year or 20 percent, saving the installation about \$700,000 a year, said Vince Guthrie, the Fort Carson DPW Utility Programs manager.

The post irrigation system underwent a high-tech overhaul in June when a computerized control system that uses global positioning technology and weather stations to apply water based on



John Bishop, Fort Carson Support Services irrigation repair technician, monitors one of the evapotranspiration-system clocks. Photo by Susan C. Galentine

current weather conditions was installed. The evapotranspiration-sensing system downloads information about weather conditions from the previous day and the impact on water evaporation on the soil in specific areas to calculate the exact amount of timed watering needed. Traditional systems can over saturate and cause runoff, wasting a substantial amount of water.

The system consists of 135 weather clocks located across the cantonment in irrigated areas that download GPS information collected by 36 weather stations on post — one per square mile. The weather clocks calculate how many gallons per minute of watering are needed to replace what was lost from the day’s weather elements, explained Alvin Jackson, Fort Carson Support Services grounds supervisor.

The system shuts off automatically if watering goes over a specific threshold, which could indicate a leak.

“This smart irrigation control system will help assure that we use the right amount of water at the right time to keep plants and turf areas healthy,” said Guthrie, who anticipates that eliminating wasted irrigation water will save Fort Carson more than \$300,000 per year through a 20 percent reduction, or 50 million gallons a year savings.

Wind and rain sensors will be added ➤

Acronyms and Abbreviations	
DPW	Directorate of Public Works
GPS	global positioning system
PNNL	Pacific Northwest National Laboratory



Yongsan's In-house Asbestos Removal Team saves time, money

by Charles Markham and William Rogers

Facilities built throughout the Army before the 1980s usually contain asbestos in one form or another. Asbestos was commonly used due to its resistance to fire, heat, electrical and chemical damage and its sound absorption and affordability. However, as everyone has learned, asbestos can cause lung disease. Its safe removal and encapsulation is regulated by local laws and Army regulations.

The presence of asbestos-containing materials in U.S. Army Garrison Yongsan facilities in Seoul, South Korea, is no different than asbestos found in continental U.S. structures, and USAG Yongsan faces similar challenges. Common areas where asbestos is found include pipe insulation, flooring and duct gaskets. In response, the Yongsan Directorate of Public Works In-house Asbestos Removal Team goes to work.

Although the long-term plan is to relocate USAG Yongsan 50 miles to the south to USAG Humphries, many projects at Yongsan still require maintenance, renovation or demolition work to keep the mission going.

The DPW In-house Asbestos Removal Team consists of a local national trained force of seven individuals who have full-time jobs during the day and volunteer their evenings and weekends to remove asbestos. The team's occupational background is diverse. Some members are

carpenters, plumbers and electricians by trade, and others have graduate degrees in environmental engineering and environmental sciences.

USAG Yongsan environmental protection specialist Na Chong Pok is the team's program manager. Na is passionate about this team and its success. He is one of the founding members of the team and helped organize this critical mission support function in 2001. He coordinates projects within the DPW and ensures that all volunteer team members are trained and medically examined annually in accordance with the U.S. Forces Korea Environmental Governing Standards.

"Ever since the establishment of the In-house Asbestos Removal Team, our members have been properly trained to remove asbestos in small- to mid-level abatement projects," Na said. "They strive to conduct the work in a safe and effective manner."

In addition to its training, the team uses data collected from asbestos surveys conducted throughout the years to ensure that, if a project is likely to encounter asbestos, the team will be ready to identify and remove it in the early stages of planning.

The team's effort has not gone unnoticed. Before the team's formation, asbestos removal was executed through a local environmental contract. This



In-house Asbestos Removal Team members double bag asbestos debris in preparation for disposal at USAG Yongsan. Photo by Na Chong Pok

outsourcing added time and cost to a project.

Since the In-House Asbestos Removal Team began in 2001, USAG Yongsan has saved more than \$1.7 million and reduced the asbestos removal requirement by 30 to 60 days per project as compared to contracting out the work. Cost savings and avoidance as well as accelerating projects allow the DPW to do more and spend funds on projects that improve the quality of life for Soldiers and Families in these resource constrained times.

Through this team's continued dedicated efforts, USAG Yongsan is able to provide timely and cost-effective asbestos abatement work, ultimately providing a safer environment and better amenities for its community members.

POC is Charles S. Markham, DSN 315-724-3900, charles.s.markham2.civ@mail.mil.

Charles Markham is the director of Public Works, and William Rogers is the chief, Environmental Division, USAG Yongsan.

Acronyms and Abbreviations

DPW	Directorate of Public Works
USAG	U.S. Army Garrison

(continued from previous page)

to the systems this summer to further enhance water savings, Jackson said. High winds or unexpected rain during irrigation periods will automatically shut down the sprinkler heads to avoid water waste.

Plans are also under way to install 40 percent more efficient sprinkler heads that apply water in droplets as opposed to

traditional spray. Sprayed water evaporates easily.

The system's 'brain' relies on the irrigation distribution system to properly disperse water on landscaped areas, Guthrie said. Having the right sprinkler heads with proper placement helps ensure that irrigated areas get the right amount of water.

Fort Carson's comprehensive approach to reducing irrigation demand will yield cost savings as well as bring the installation significantly closer to achieving its net-zero water objectives.

POC is Susan C. Galentine, 719-526-4320, susan.c.galentine.ctr@mail.mil.

Susan Galentine is a public relations contractor, DPW, Fort Carson.



Fort Detrick capably manages solid waste

by Mark Dressler

Fort Detrick, Md., efficiently handles the solid waste generated on the installation with incinerators, a landfill and a robust recycling program.

Municipal waste

Fort Detrick uses two incinerators to process its municipal solid waste. The incinerators' waste heat boilers generate steam that is used by various buildings on the installation. Whatever material can't be incinerated, along with the incinerator ash, is disposed at Fort Detrick's state licensed MSW landfill.

The MSW landfill sits on 60 acres and has a licensed capacity of 1.6 million cubic yards. The landfill has more than 120 years of capacity at current usage rates still available.

The incinerators, built in 1975, are rated for 2,000 pounds of waste per hour. They operate one at a time 24 hours per day — 16 hours of loading time and eight hours of burn down — alternating each week.

The solid waste utilization rate is 11,000 pounds per day, or less than 50 percent of capacity. While one is operating, the other undergoes any maintenance needed.

Fort Detrick's Directorate of Public Works employs nine full-time employees plus the Solid Waste Program manager to conduct its Solid Waste Program. DPW employees operate the incinerators and collect the waste from containers located throughout the installation.

Fort Detrick uses 94 8-cubic yard dumpsters to collect the solid waste. Dumpsters are serviced from once per week to daily according to a predetermined schedule. Front-end loader trucks with scale attachments service the dumpsters.

The scale attachment weighs each dumpster's contents individually so the weight can be logged for each customer. Fort Detrick houses many tenant organizations, and each customer must be billed separately for its share of the solid

waste costs. DPW establishes the billable rate using the standard Department of Army utility rate calculations based on the previous year's costs.

Medical waste

Fort Detrick has a high volume of regulated medical waste, known as RMW, by virtue of its mission and its tenants. Fort Detrick provides its tenants with an on-site RMW treatment option rather than sending the RMW off site for proper treatment and disposal.

The installation has two RMW incinerators, the Army's only incinerators licensed to treat RMW. The incinerators are in the same building as the MSW incinerators but are newer, having been installed in 1996. Each incinerator is equipped

Acronyms and Abbreviations

DPW	Directorate of Public Works
MSW	municipal solid waste
RMW	regulated medical waste

with a waste heat boiler to produce steam for installation use.

The RMW incinerators have a capacity of 1,000 pounds per hour but have recently been operating at less than capacity for eight-hour cycles processing 4,500 to 5,500 pounds per day. One incinerator is operated while the other is shut down.

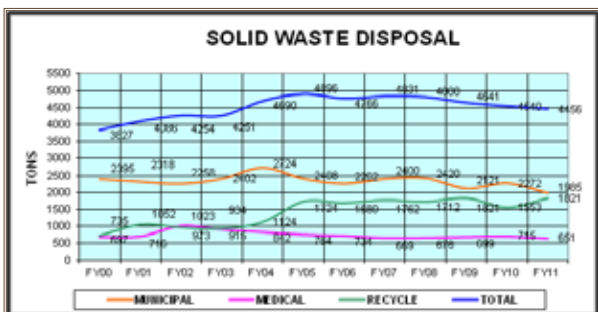
The MSW and RMW incinerators offset about 15 percent of the installation's total steam generation.

Recycling

The Fort Detrick Recycling Program is managed by the same group as the Solid Waste Program, DPW, with the same program manager. The Recycling Program employs three full-time and one part-time employee to conduct its daily operations. The workers pick up the recyclable materials throughout the installation and sort and process the materials for sale.

The Fort Detrick Recycling Center accepts paper, cardboard, plastic, glass, textiles and metals. Wooden pallets and debris are also managed by the Recycling Program. The Recycling Program maintains collection trailers at three locations, and, with the exception of cardboard, recyclable material is collected from all offices and buildings on post.

At the Recycling Center, the workers segregate and consolidate the various materials to maximize their marketability. The end products are: baled plastics, plastic bags, cardboard, newspaper, white ledger paper, mixed paper, computer paper and small blocks of aluminum cans. Metal cans are mixed with the scrap metal. Roll-off quantities of clear glass, brown glass and green glass are sold. Both mixed scrap metal and stainless steel are sent out in roll-off containers as well. Serviceable wooden pallets are collected and sold to ➤



MSW has declined at Fort Detrick while recycling has increased.



Fort Detrick uses municipal and medical waste to produce steam. Graphics courtesy of Fort Detrick



Corps upgrades wastewater aerators at Afghan training center

by Karla Marshall

Upgrades to the Afghan National Army's Joint Regional Training Center's wastewater facility near Kandahar were completed April 8 by the U.S. Army Corps of Engineers.

"Working with the contractor ITT Exelis, USACE replaced the aerators in each of the four wastewater basins," said Penny Coulon, the Afghanistan Engineer District-South's contracting officer's representative for the Joint Regional Training Center facility. "The original aerators were not big enough to support the volume of wastewater that travels through the system daily and broke down frequently. For \$92,000, we replaced the old aerators with larger, more robust aerators that will need less maintenance."

Aerators are a critical part of treating wastewater, said ITT Exelis Mission Systems' regional manager David Greenlief.

"In this system, the influent travels underground to a lift station," Greenlief said. "From the lift station, it gets pumped into tank number one."

In each of the four aeration tanks, the wastewater passes through an aerator to oxygenate the liquid. The influent spends time in each tank before ending up in the settling tank. When the wastewater gets to the settling pond, it undergoes a 45-minute treatment process before it is released into the nearby dry creek bed.

Each step of the process, from aeration,



These four aerators await disposal after they were replaced as an upgrade to the Afghan National Army's Joint Regional Training Center wastewater facility. Photo by Karla Marshall

to settling, to testing is important, said Greenlief.

"We treat the effluent in accordance with World Health Organization standards," he said. "The goal is to ensure that the water we release back into the environment is not hazardous, so our treatment plan includes testing dissolved oxygen levels before we release it."

Adequate oxygenation is crucial to ensuring that the effluent does not deplete oxygen from the nearby environment and, in turn, supports nearby plant growth, Greenlief explained.

"By following the plan we have in place, the wastewater actually supports the

environment and plant life," he said.

While the effluent is not potable, it is free of harmful micro-organisms and diseases typically attributed to untreated water, said Coulon.

"This wastewater treatment facility upgrade has been an important project for me personally," she said. "I came to Afghanistan with the goal of making it a better place when I leave than when I arrived. I can honestly say that this project contributes to the overall sanitation of the training center and the nearby area. I'm proud to have played a role in the project."

The U.S. Army Corps of Engineers oversees construction projects throughout Afghanistan that help the government of Afghanistan provide critical services and infrastructure for its citizens. The wastewater treatment facility supports hundreds of Afghan and NATO Soldiers who work and train at the Joint Regional Training Center.

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

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

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a pallet vendor. Broken pallets and other wood debris are ground for compost.

Fort Detrick provides recycling services to the non-Army tenants at the installation at no charge. The Recycling Program also collects recyclables from the housing area managed by Balfour Beatty. Since housing is privatized, this activity is not the Recycling Program's responsibility. Balfour Beatty pays to have recyclables picked up at the

housing areas.

The Recycling Program's annual income is about \$215,000. The overall diversion rate, excluding construction and demolition debris, is 51.31 percent.

POC is Mark Dressler, 301-619-2323, mark.dressler@us.army.mil.

Mark Dressler is the solid waste manager, Fort Detrick.



Fort Bragg Public Works 'All-American Team:' Iron Mike, ProdMan

by Christine Hull, Michael Saylor and Kelly Roscoe

Look, First Sergeant! Up there! Who is that?"
"That's Iron Mike. He's repairing that roof."

"Wow! He was just fixing our shower this morning."

"Yeah, Sgt. Smith. He seems to be *where* we need him *when* we need him. He gets special instructions each day from the Directorate of Public Works' Production Management Team — ProdMan."

"ProdMan?"

"ProdMan is the brains of the DPW Operation and Maintenance Division. Iron Mike has the electrical, mechanical

and carpentry skills to fix any facility issue; ProdMan optimizes his workload by organizing and prioritizing Iron Mike's daily task list.

"I'm going over to DPW to pick up some paint. Hop in my Humvee, and I'll show you how Iron Mike and ProdMan help DPW keep Fort Bragg Airborne ready."

At DPW...

"Sgt. Smith, this is the OMD, and here comes

one of the work supervisors. Sir, Sgt Smith just had an Iron Mike sighting. He's still in shock. Can you show him how y'all get work done at Fort Bragg?"

"Sure thing, Top. You came at a good time. Our chief is about to brief the director and the garrison commander on how we manage production effectively at DPW. You can sit in."



Air conditioning mechanic Bill Bradford prepares to install a ductless minisplit air conditioner on a Fort Bragg facility.

"Since we must accomplish this work with a workforce that is currently at 60 to 80 percent strength, it is imperative that we work efficiently."

The All-American Team

"That efficiency is possible due to our superheroes, Iron Mike and ProdMan. 'Iron Mike' is the collective name for our capable in-house maintenance technician workforce. 'ProdMan' is DPW's Production Management cell. ProdMan's people and solutions apply intelligent logic to the General Funds Enterprise Business System data, ensuring we get the right Iron Mike to the right job within the Army's time standard.

"GFEBs is our work management system, and Fort Bragg DPW has embraced it. Everything we do starts and ends with GFEBs. ProdMan augments GFEBs' capabilities with external assignment algorithms that help us efficiently complete DMOs.

"The DMO fulfillment process starts ➤



Stephanie Ferguson, Cynthia Williams and Lourbeth Gomez perform ProdMan duties at Fort Bragg.



Air conditioning mechanics Nicholas Washington, Darrell Smith and Kevin Beekman replace a compressor on a barracks chiller at Fort Bragg. Photos courtesy of DPW, Fort Bragg

More than a city

"At Fort Bragg DPW, our workload is heavy. We process more than 400 demand maintenance orders, which we call DMOs, per day. In addition, we complete more than 16,000 preventative maintenance orders, or PMOs, and log more than 80,000 labor hours on operational work orders per year.

Acronyms and Abbreviations

DMO	demand maintenance order
DPW	Directorate of Public Works
GFEBs	General Funds Enterprise Business System
OMD	Operations and Maintenance Division
ProdMan	Production Management
PMO	preventative maintenance order
QA	quality assurance



Fort Detrick improves numbers with reliability centered maintenance

by Larry Potter

Reliability centered maintenance, or RCM, has been the Fort Detrick, Md., Directorate of Public Works standard for infrastructure sustainment for the past eight years. The DPW has increased its service order and preventative maintenance performance by ordering PM only for critical equipment that impacts the mission. This practice brought the PM workload within the capability of the manpower available, reduced costs and provided more reliable mission critical systems.

When the RCM Program started, the Fort Detrick DPW identified PM for

every piece of equipment and the frequency recommended by the manufacturer. Through the years, the PM numbers required to keep equipment operational and critical missions on line have been optimized. The DPW also reduced the frequency of PM to only what is absolutely required. Some noncritical equipment is allowed to run to failure when it is not cost effective to do PM and the mission will not be impacted if the equipment fails. These procedures are part of the RCM Program.



Fort Detrick uses infrared scanning to spot potential problems before they become serious. Photo courtesy of Fort Detrick

mode, more work is accomplished with the same amount of money by scheduling the work in a routine fashion.

Priority 1 service orders are “emergencies.” These have been reduced ➤

The RCM Program moved the DPW from a breakdown maintenance operation to a routinely scheduled maintenance operation. Instead of operating in a crisis

Acronyms and Abbreviations	
DPW	Directorate of Public Works
HVAC	heating, ventilation and air conditioning
PM	preventive maintenance
RCM	reliability centered maintenance

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when service clerks receive a facility-related repair requirement by phone, walk-in or via our web page. For each valid request, we create a DMO in GFEBs.

“After close of business each day, a ProdMan system reads the GFEBs database and analyzes every open DMO at Fort Bragg. We’re looking for key information: issue type — plumbing or electrical, for example; building type; priority; location; customer; and status. During the night, ProdMan’s software automatically filters, sorts, groups and prints a prioritized a list of DMO tasks for Iron Mike.

“Each morning, Iron Mike picks up his list and starts his maintenance work. By completing his jobs in the order that ProdMan lists them, Iron Mike doesn’t waste time driving around the installation. And since ProdMan knows where Iron Mike will go every day, the technician also gets PMOs for those buildings.

“Doing PMOs per the GFEBs

schedule helps us stay ahead of the game by reducing the number of issues that enter the DMO pipeline. Not only does ProdMan help Iron Mike complete his tasks in accordance with DPW and Army priority standards, but the system also frees time for OMD’s supervisors and work leaders to lead, inspect, train and manage the Civilian workforce.

“At the end of each work day, a ProdMan clerk receives Iron Mike’s Labor and Equipment Usage report and updates GFEBs. Each evening, ProdMan starts the cycle again.

“ProdMan never sleeps. Iron Mike never fails to fix things efficiently and effectively. Together, they’re the unstoppable “All-American Team” that keeps Fort Bragg Airborne ready.”

Clean, transparent data

“One of the most important benefits of the ProdMan cell is that GFEBs DMO data is clean and up to date. Each day, while OMD work leaders perform quality assurance on Iron Mike’s work, ProdMan

performs QA on the DMO backlog and on cost and performance statistics to eliminate duplicate requests and other errors, allowing leadership to accurately answer customer inquiries and properly allocate resources.

“In addition, ProdMan presents DMO status information to external customers via the web, so building occupants can check on the progress of their requests at any time. Clean, transparent data multiplies Iron Mike’s performance exponentially.

“GFEBs is relatively new, and we are still mastering the system. However, DPW’s All American Team of Iron Mike and ProdMan are optimizing the GFEBs environment and making a positive difference for our customers.”

POC is Christine Hull, 910-432-6336, christine.g.hull.civ@mail.mil.

Christine Hull, Ph.D., is the chief, OMD; and Michael Saylor and Kelly Roscoe are contractors, Kord Technologies Inc.; DPW, Fort Bragg. 🍌



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to a minimum, around 1 percent of the workload. There will always be equipment that unexpectedly breaks and produces an emergency. Priority 2 service orders are “urgent.” They have also been reduced to minimum. Priority 3 service orders are “routine.” These are now the norm, and with PM are roughly 80 percent of the workload, which means the work can be scheduled in a more efficient and cost-effective manner.

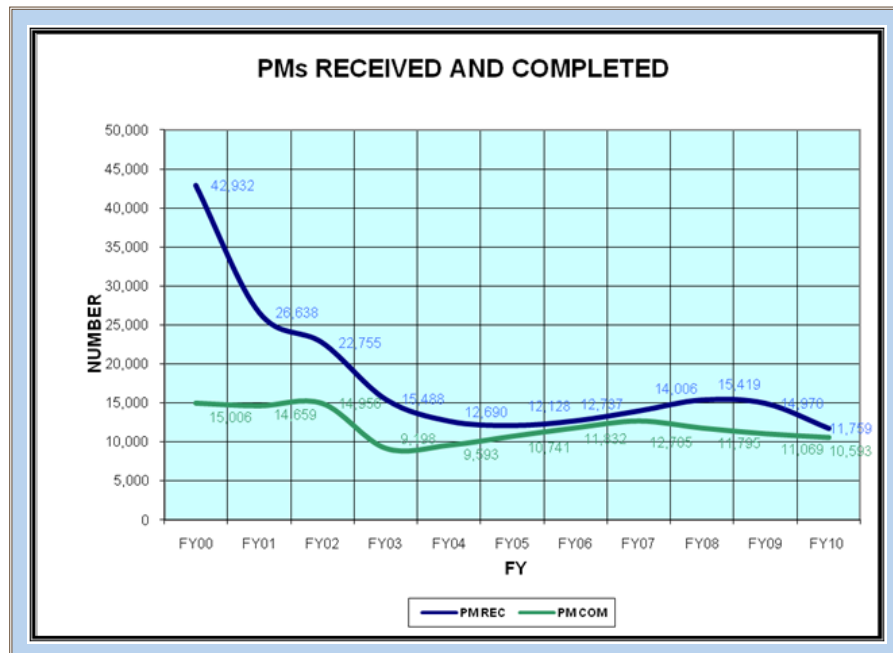
RCM is a maintenance strategy that uses technological tools to assist management and the workforce in deciding when to perform maintenance on equipment, producing highly reliable systems. These tools include: power monitoring, shaft alignment tools, infrared scanning technology, and a supervisory control and data acquisition system.

Power monitoring – Fort Detrick installed a power-monitoring platform consisting of circuit monitors at the two main electrical feeds to the installation and at the 30 main breakers at the post’s seven substations. The system continuously monitors and displays amps, volts, watts, harmonic distortion and other pertinent data as well as storing historical data and alarm or trip event information. The system is hard wired from the substations to miniservers in the Network Enterprise Center.

Power monitoring allows the DPW to track and monitor electrical events, to meter usage and to help predict possible problems before failure, decreasing negative impact on critical systems. The initial platform is designed to allow for future expansion into each facility for power monitoring postwide using smart meters.

Shaft alignment tools – The DPW uses a laser alignment tool to provide faster, more accurate results than were possible with the old equipment.

Infrared scanning technology – The DPW uses infrared scanning devices to



Fort Detrick’s RCM Program brings service requests in line with workload completed. Graphic courtesy of Fort Detrick

seek out hot spots in both mechanical and electrical equipment during routine PM checks. This procedure spots potential problems before they become serious. The devices can also detect heat loss and moisture in roofs.

Supervisory control and data acquisition system – Fort Detrick is developing a system to monitor heating, ventilation and air conditioning systems in its buildings. The supervisory control and data acquisition system starts and stops pumps and fans, sets schedules and adjusts temperatures through the Web.

The monitoring system allows building occupants to monitor their HVAC systems, and it allows DPW maintenance personnel to monitor and control HVAC systems remotely. The system must be accessed through a government computer and a common access card for security.

Seventeen buildings are online, and an additional 11 buildings will be added in the next year through an approved \$750,000 Energy Conservation Investment Program project.

The monitoring system helps the mechanic maintain the system more efficiently. One feature measures the pressure across filters so that filters are changed only when needed. Vibration sensors and heat sensors on major equipment will be added in the future so that the DPW can determine when maintenance is required and maintain before failure.

POC is Larry Potter, 301-619-2441, larry.potter@us.army.mil.

Larry Potter is director, Public Works, Fort Detrick.



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Garrison Hawaii embraces sustainable water, energy practices

by Hayley Diamond

Sustainable water management is not new to U.S. Army Garrison Hawaii. Since 1916, Kilauea Military Camp, located in Volcanoes National Park on the island of Hawaii, relies on rainwater harvesting for its water needs.

Rainwater harvesting is the practice of collecting rainwater from hard surfaces, such as roofs, in order to use the water for gardening, washing and flushing toilets. The long-proven, sustainable practice dates to at least 1500 B.C. The benefits include conserving potable water supplies, saving the energy involved in treating and transporting potable water and preventing water quality impairments that can be associated with storm-water runoff regulated by the Clean Water Act.

The staff who oversees compliance with the Clean Water Act Program at USAG Hawaii's Directorate of Public Works Environmental Division developed several water and energy conservation demonstration projects. In addition, community partnerships and supportive leadership resulted in successful projects that show how the garrison strives to provide a sustainable environment for training, living, learning and working.

In new development projects, rainwater harvesting can achieve as many as five Leadership in Energy and Environmental Design rating points in water efficiency as well as fulfill several of the energy, efficiency and security goals outlined in the *Installation Management Campaign Plan*.



Boy Scouts install the irrigation system that will be supplied by rainwater collected from the OANRP building's roof. Photo by Hayley Diamond

Since May 2010, the USAG Hawaii Clean Water Act Program staff has been educating future generations on sustainable water management practices during annual presentations to the fifth grade class at Hale Kula Elementary School on Schofield Barracks. Presentations include an interactive lesson about where water comes from, how water is used, how it can be conserved and how to use rainwater harvesting calculation worksheets.

The staff also collaborated with the Hawaii Department of Education; Lend Lease, the privatized Army housing development partner; and local businesses to construct an outdoor classroom at the school, which was completed in October. Funded by a \$10,000 grant from Lend Lease Community Fund and supplemented by donated materials and labor from local businesses, the outdoor classroom project improved community involvement and environmental awareness.

The outdoor classroom's focal feature is a 3,000-gallon cistern for storing rainwater collected from the school's roof. Stored rainwater flows via gravity to drip-irrigated, raised bench planters and can be used to water a nearby working garden.

Additional components include a shade fabric covering and a rain garden that receives any excess water from the cistern. Students can track how much rainwater is collected and used in a clear-level gauge attached to the cistern.

The outdoor classroom serves as an excellent space within which students are educated on sustainable landscape practices and natural resource protection. A second outdoor classroom is scheduled to be constructed in September on Fort Shafter.

In July 2010, the Clean Water Act Program staff collaborated with the Oahu Army Natural Resources Program staff and a local Boy Scout troop to construct a solar-powered irrigation system.

Acronyms and Abbreviations

DPW	Directorate of Public Works
OANRP	Oahu Army Natural Resources Program
USAG	U.S. Army Garrison

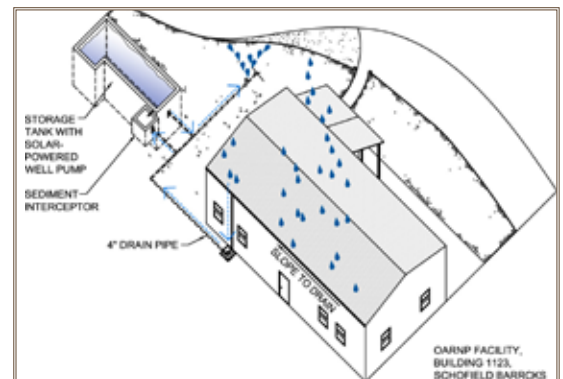
The project's purpose was to irrigate a lawn bordering the OANRP's interpretative garden using rainwater collected from the OANRP building roof.

Early in the project development phase, OANRP staff identified an abandoned, underground sediment tank adjacent to its office building that could store collected rainwater. The project incorporates sustainable technology, including a solar-powered well pump and weather station that adjusts the irrigation based on local precipitation, providing further water and energy savings.

Innovative technologies such as those featured at the OANRP rainwater harvesting project can be tested for application in new construction and redevelopment. The goal is to achieve compliance with federal requirements for water and energy savings.

POC is Shane Bourke, acting Clean Water Act Program manager, Environmental Division, DPW, USAG Hawaii, 808-656-3105, shane.j.bourke.civ@mail.mil.

Hayley Diamond is a research specialist, Clean Water Act Program, Environmental Division, DPW, USAG Hawaii.



An underground storage tank at the OANRP building on Schofield Barracks will be used to store rainwater collected from the building's roof. Graphic by Hayley Diamond



Arlington launches geospatial interment scheduling capability

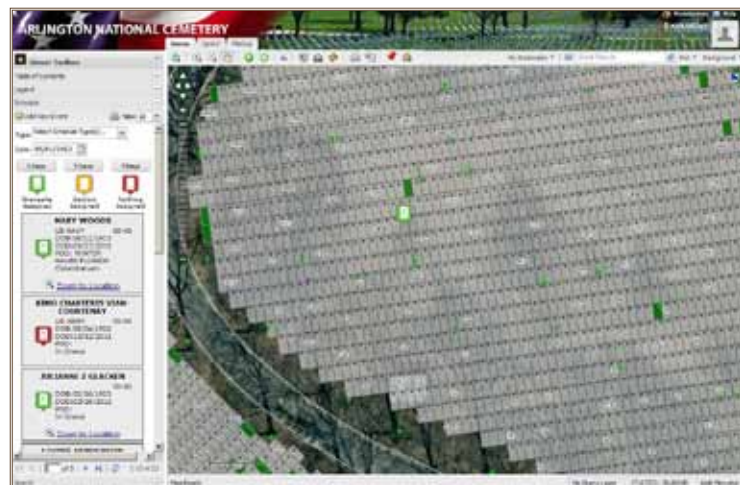
by Dan Gardner

In August 2010, the Arlington National Cemeteries Program asked the Office of the Assistant Chief of Staff for Installation Management to help implement Arlington National Cemetery's Geospatial Information System. The goal was to use the geospatial capabilities of Army Mapper, the Army's enterprise geospatial system, to visualize assets, increase accountability and provide the integrating visual component for multiple cemetery functional operations.

Arlington National Cemetery, the

nation's most well-known military cemetery, had been cited for serious asset accountability issues. Operations for asset management, interment scheduling and allocations had been largely conducted in hard copy format with little process automation or database integration.

In September 2010, OACSIM's Installation Geospatial Information and Services staff met with Arlington staff members to discuss a three-phased implementation plan for fielding a robust geospatial capability that would integrate into Arlington's operations.



The Arlington National Cemetery Army Mapper application provides exact locations of individual grave sites. Photo courtesy of Army Mapper



Each grave site is examined and photographed during records reconciliation to ensure the accuracy of the Army Mapper application. Photo courtesy of The Old Guard

and procure task orders through the Army Geospatial Center to collect locations of individual grave sites and niches as well as application development for an Arlington National Cemetery module within the Army Mapper architecture under an IGI&S contract.

Parallel records reconciliation

The Gravesite Accountability Task Force physically examined and photographed 259,978 grave sites, niches and markers using a custom-built smartphone application. Each photo was matched with records in a database.

Arlington staff members are 84 percent complete in validating records, Arlington National Cemetery Program officials said, and are on track to finish this summer. When complete, the accountability effort will create a single, verifiable and authoritative database of all those laid to rest at Arlington, and it will be linked with Arlington's geospatial mapping system.

Implementation

On March 12, Arlington officials began using the internal Army Mapper application. The application allows the staff to:

- assign burial grave sites and columbarium niches for scheduled funerals,
- interact with and update the Interment Scheduling System via web services,
- manage burial routes with ceremony conflict detection,
- track cemetery vehicles,
- search burial plots,
- print section maps,
- update headstone set dates,
- schedule events and maintenance,
- run utilization reports, and

Phase 1: OACSIM used the IGI&S Support Center to inventory existing geospatial data from multiple sources, standardize priority data layers to meet the Office of the Secretary of Defense standards and reconcile data to the Army Real Property Inventory.

Phase 2: OACSIM funded an aerial acquisition to procure three-inch resolution imagery through the Corps of Engineers' St. Louis District that included accompanying digital elevation model data, and light detection and ranging elevation contours.

Phase 3: OACSIM provided management support to help Arlington staff create

Acronyms and Abbreviations	
IGI&S	Installation Geospatial Information and Services
OACSIM	Office of the Assistant Chief of Staff for Installation Management



Corps supports O&M at Joint Regional Afghan National Police Center

by Mark Ray

If you were looking to illustrate “challenge,” operating and maintaining a large installation in Afghanistan could serve as a prime example. The U.S. Army Corps of Engineers’ Afghanistan Engineer District-South meets that challenge every day, as they oversee the national O&M contract for the Joint Regional Afghan National Police Center, near Kandahar Airfield.

The compound includes four separate areas within a single perimeter fence:

- The Afghan National Border Police Command has nearly 580 personnel on a 20-building compound.
- The Afghan National Uniform Police has about 240 personnel on a 14-building compound.
- The Afghan National Civil Order Police has about 310 personnel on a 23-building compound.
- The Regional Logistics Center and Uniform Police Regional Headquarters has about 41 personnel on a 10-building compound.

The Afghan Ministry of Interior also has a building on the compound in which

between 80 and 100 personnel provide administration for the region.

The compounds are much more than office space. They have junior and senior barracks, dining facilities, vehicle and other maintenance facilities, warehouses, training facilities, generators, wells and wastewater treatment facilities to support the needs of more than 1,200 Afghan personnel and their coalition mentors.

The responsibility for maintaining this critical infrastructure falls to the South District’s Operations and Maintenance Execution Division and its national O&M contractor for the site, ITT Excelis.

“The contractor provides a full range of



O&M workers install a new generator at the Joint Regional Afghan National Police Center, part of USACE efforts to ensure reliable power on the compound. Photo by Mark Ray

operations and maintenance services,” said Penny Coulon, the compound contracting officer’s representative. “These include the traditional trades such as carpentry, plumbing and electrical work, and more complex work including operating and maintaining large generators, heating, ventilation and air-conditioning systems, wells and water treatment distribution systems, and wastewater collection and treatment.”

Acronyms and Abbreviations	
O&M	operations and maintenance
USACE	U.S. Army Corps of Engineers

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- calculate costs for routine maintenance activities.

The geospatial mapping system uses accurate data collected from global positioning system units that use a virtual reference station wireless service for real time post processing yielding an average accuracy within 10 centimeters.

The geospatial data will link, via web service, to the data collected and validated as part of the Army’s grave site accountability study through the Interment Scheduling System.

Next steps

This fall, Arlington will release applications for Blackberry, Android and Apple mobile devices that will allow visitors to search, locate and map interments; create personalized walking paths; and navigate the cemetery in real time. Arlington will also deploy the mapping application on kiosks in the visitor center and at other popular tourist locations around the cemetery as well as on its newly redesigned website, <http://www.arlingtoncemetery.mil/>.

“Family members and loved ones can take that iPhone app, get directions to the

grave site, see the headstone if they can’t come back very often and really allow technology to enhance the user experience at Arlington Cemetery,” said Maj. Nicholas Miller, chief information officer.

“Nothing beats coming here to the cemetery,” Miller said, “but if you’re not fortunate to do so, you can still experience the cemetery from anywhere in the nation.”

POC is Dan Gardner, 571-256-8159, daniel.e.gardner.civ@mail.mil.

Dan Gardner is the deputy program manager, IGI&S, OACSIM.



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Current priorities at the compound, according to Coulon, are:

- stabilizing operations and installing new generators at the installation power plant,
- bringing the wastewater treatment plant up to standard, and
- repairing and maintaining both internal street lights and perimeter lights.

“We are making good progress on the generators,” she said. “We have received four new generators to replace failed [or] failing equipment and are currently installing and synchronizing them. We cleaned out the four large fuel tanks that supply the power complex and are preparing to line the tanks to extend their service life. Finally, because fuel quality has been an issue and probably will continue to be an issue, we are installing a fuel filter system between the truck discharge and storage tanks, which will also help to extend the life of the fuel tanks and ensure that the fuel getting to the generators is as good as we can make it.”

“The original generators on the site initially had electrical issues in their alternator assemblies, which actually generate the electricity,” said Dave Greenlief, south regional manager for Afghan National Security Forces ITT Excelis. “These problems eventually became mechanical issues. We brought in a generator expert, who analyzed the issues and provided [the] way ahead.”

While the O&M team waited for the new generators to arrive, it had to work to keep at least three generators going, which is the minimum required to power the complex, Greenlief said.

“That was a difficult situation, since we could not take any of them off-line for major maintenance and overhauls,” he said. “Issues with fuel quality made the situation even more difficult. Now that we have brought in the new generators, we will be able provide reliable power and use three older generators as backups. We

will be able to perform regular O&M and shouldn’t have problems in the future.”

At the wastewater treatment plant, the O&M team is waiting for delivery of replacement aerators and a new control panel. At the same time, it is cleaning out settlement ponds.

“As we perform O&M on the facilities, we look for opportunities to replace original systems that may not have been appropriate to Afghanistan with simpler systems that are easier to operate and maintain,” Greenlief said. “The wastewater treatment plant is a good example. The aerators originally had a complex system of controls with multiple timers, relays, circuit breakers and overload protectors. We worked with the manufacturer to develop a system that will have a single, manual timer, one circuit breaker and one overload protector, so it doesn’t require a degree in electrical engineering to operate, and it can be maintained here.”

Fueling stations are another area where The O&M team is also working to install equipment that is easier to maintain and operate in the fueling stations. Getting electrical pump parts for the fueling station on the civil order police compound was difficult, and the pumps required advanced skills to maintain, Greenlief said.

“We are replacing that system with a gravity-fed system that doesn’t require pumps and will be easy for the Afghans to maintain in the future,” he said. “If it works, we’ll consider using it as a model for the other fueling stations on the compound.”

“O&M on the compound has been a team effort with ITT Excelis working closely with the Corps of Engineers and the mentors to get things that were broken or not working correctly fixed and in a manner that would allow systems to be operated and maintained after the Afghans take over O&M,” Greenlief said.

“Along with coordinating the mentors, we’ve also brought the Afghan leadership

on the compound into the process,” Coulon said. “I have regular discussions with Afghan leaders that have forces stationed on the compound to keep them informed of issues and what we are doing to correct them. The discussions help increase their sense of ownership of facilities, which is important as we move toward eventually turning over the responsibility for O&M of the complex.”

The contractor is also looking toward the future by hiring as many local Afghan tradesmen as possible, Greenlief said.

“This policy benefits us right now because it gives us the ability to procure many materials locally,” he said. “Our Afghan workers know what is available in Kandahar City, how much it should cost, and they can deal with the merchants in their own language.”

Employing Afghan workers and purchasing materials locally also supports the local economy, Coulon said.

“And when we transition O&M of the complex to the Afghan authorities, they will have a pool of fully trained tradesmen who know the site to draw from if they want,” Greenlief concluded.

“The team that is maintaining the regional security forces compound has faced significant challenges,” said Air Force Col. Ben Wham, Afghanistan Engineer District-South commander. “They have done an exceptional job keeping the complex running in the face of those challenges, and they are doing a great job preparing a workforce and installing systems that will allow the Afghan forces to assume responsibility for the site. Much of what they are doing is a model for O&M throughout Afghanistan.”

POC is Penny Coulon, DSN 318-265-6271, penny.e.coulon@usace.army.mil.

Mark Ray is chief, Public Affairs, Afghanistan Engineer District-South, USACE. 



Fort Bragg Green Boot Program builds sustainability into mission

by Jonelle Kimbrough

A popular quote advises, “Be the change you want to see in the world.” At Fort Bragg, N.C., the Green Boot Program is a means for positive changes both in the environment and in the community.

Fort Bragg is one of the United States’ premier military installations for the training, mobilization and deployment of contingency forces. The post’s functionality depends on the responsible use of resources — land, facilities, materials, energy, water, transportation and people. The ultimate goal is a sustainable community that meets the Soldier’s needs today, tomorrow and forever.

To realize this goal, the Soldiers and the community must actively connect to all aspects of resource conservation. As the Army’s first certified sustainability program for military installations, the Green Boot Program promotes community engagement, involvement and innovation to ensure a viable installation for subsequent generations of warfighters, the Civilian support force and their Families.

“The Green Boot Program provides a vehicle to empower the workforce, allowing them to identify opportunities to conserve resources and implement conservation practices into daily operations,” explained program coordinator Melinda Harrington.

Organizations pursuing Green Boot certification incorporate simple measures within their facilities to improve air quality, reduce waste, recycle, encourage alternative transportation, purchase environmentally sound supplies and conserve water and energy. As a result, facility occupants learn the true costs of maintaining an installation, and Fort Bragg experiences a decrease in operational expenditures. The saved funding can potentially be reallocated for improving infrastructure, supporting military objectives and bolstering the quality of life on the installation.

“Being green helps us all,” said Ella Smith, Directorate of Human Resources.

To promote ease of accomplishment, the program allows entities to tailor their sustainability goals and initiatives to their individual needs and missions. Green Boot organizations have employed a variety of creative means to achieve certification. They removed lamps from vending machines, implemented recycling programs during field training exercises, encouraged ride sharing and purchased environmentally preferred cleansers for emergency services vehicles.

The military units and Civilian organizations that have achieved or are in the process of certification are:

- Mobilization and Deployment Brigade
- Directorate of Public Works
- Directorate of Logistics
- Directorate of Human Resources
- 97th Civil Affairs Battalion
- Bravo Company, 307th Brigade Support Battalion
- Installation Safety Office
- Range Control
- garrison command offices
- six fire stations
- Directorate of Family and Morale, Welfare and Recreation
- Directorate of Plans, Training, Mobilization and Security
- 528th Sustainment Brigade
- Airborne and Special Operations Test Directorate
- Public Affairs Office
- Directorate of Emergency Services
- 82nd Special Troops Battalion
- 1st Squadron, 38th Cavalry Regiment
- Forces Command and U.S. Army Reserve Command offices

“For me, achieving certification in this program is an opportunity to prove that environmental stewardship and uniformed military service can be complementary,” 1st Sgt. Russell Zirkle, Mobilization and Deployment Brigade, said.

“Through this program, we are showing

the nation that we as an Army are aware of the benefits of sustainability and are doing our part to reduce waste,” said 2nd Lt. Jacob Robertson, 307th Brigade Support Battalion.

“Especially in tough economic times, the Army can cut costs by living a sustainable life and still complete the mission.”

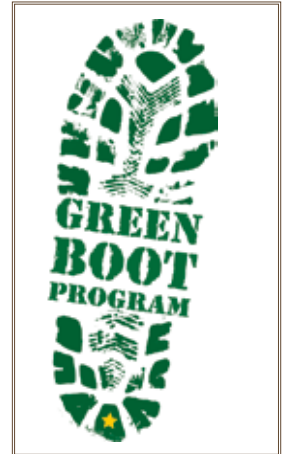
The participating organizations have reaped many practical benefits. The Mobilization and Deployment Brigade estimated that energy consumption in their facilities decreased 25 percent since the program’s start. Through the Recycling Incentives Program, many units have translated their recyclables into credits that are honored at Family and Morale, Welfare and Recreation facilities, and the education garnered from the program assists Soldiers in their missions beyond the borders of Fort Bragg.

“We deploy to countries around the world,” said Capt. Victor Fillion, 97th Civil Affairs. “We need to implement the sustainability concept here so we can assist other communities in which we operate.”

Fort Bragg’s sustainability heroes demonstrate that environmental preservation is both a viable way to fulfill the mission today and a pledge to support the needs of the Soldier tomorrow.

“Sustainability is a trend and not a fad,” said Fillion. “The policy is not going to change. It is not tied to a particular political group or administration. Sustainability is not going away.”

The Green Boot Program’s effects are both immediate and enduring. While the goals of the program are resource





Corpus Christi Army Depot makes pedestrians safe with technology

by Yong S. Choe

The Corpus Christi Army Depot, Texas, Facility Engineering Management Division's vision for safety translates to a major task to improve pedestrian safety and motorist awareness, and to prevent pedestrian-vehicle collisions. Despite that cell phone use is prohibited during operation of vehicles and machinery on the depot, distracted driving has caused pedestrian injury and near-misses on the roadways.

In response to an unusually high number of pedestrian-vehicle collisions and near-collisions, the depot's FEMD initiated a roadway warning light system for uncontrolled crosswalks.

The proactive pedestrian warning system operates within the depot's busy crosswalks. The system responds to a pedestrian's presence in the crosswalk and warns drivers. The pedestrian-activated flashing lights are visible to an approaching motorist as advance warning that someone is in or near the marked crosswalk. This system gives the motorist the advantage of being adequately alerted.

The crosswalk is lined on each side with a series of unidirectional flashing amber warning signals using LED lights embedded in the pavement facing oncoming traffic from both sides of the crosswalk. Flashing at a constant rate, the warning signals, which are installed one-

half inch above the pavement to avoid debris build-up, can be seen from as far away as 1,500 feet even in bright light.

Four bollards are placed up to 60 feet apart, two at each end of the crosswalk. When a pedestrian passes the bollards to enter the crosswalk, the warning system is activated. The activation system gives enough time for a pedestrian to cross the road in any condition.

The crosswalk's timing and the diamond-shaped pedestrian symbols' design and size comply with Manual Uniform Traffic Control Design specifications using the total crosswalk distance and the speed limit. The embedded diamond-shaped LED pedestrian symbols provide a bright indication to approaching motorists that a pedestrian is in the crosswalk. The warning system is operated with stand-alone solar panels mounted discretely on the top of the assembly with charged battery power using primarily 60 volts of solar power.

At CCAD, the flashing amber lights



LED lights embedded in the pavement are activated when a pedestrian enters the crosswalk at a CCAD intersection. Photo by Daniel Cirilo

system at uncontrolled crosswalks clearly has a positive effect. Near-misses have been reduced by 92 percent. Drivers' awareness has been enhanced as evidenced by driving habits that have been modified to be more favorable to pedestrians, especially during adverse weather conditions such as darkness, fog and rain.

Motorists are more likely to stop or slow for pedestrians who cross in or near the flashing crosswalk than those who cross elsewhere. The warning system is also visible at an adequate distance so that a driver with standard eye height can see an object with sufficient time to stop safely.

About 16 more warning light systems are scheduled to be installed in the depot through next year.

FEMD's successful use of the pedestrian warning system improves CCAD's pedestrian safety and reduces accidents and the need for police enforcement.

POCs are Daniel Cirilo, general engineering senior technician, CCAD, 361-961-7033; and Michael Webb, chief, FEMD, CCAD, 361-961-2071, michael.webb1@us.army.mil.

Yong S. Choe is an Installation Management Command Department of Army intern, CCAD.



Acronyms and Abbreviations	
CCAD	Corpus Christi Army Depot
FEMD	Facilities Engineering Management Division

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conservation and pollution prevention, its legacy is evident in a culture change throughout Fort Bragg. Through the program, Soldiers and Civilians gain knowledge of operational sustainability and enthusiasm for sound resource use. They become environmental stewards both in their places of employment and in their homes, achieving the Army Triple Bottom Line of mission, environment and community.

"I want future generations to have the same opportunities that I have had,

and living a sustainable life is the only way to ensure this goal," Robertson said. "Sustainability is the way of the future. As President Kennedy said, 'Ask not what your country can do for you but what you can do for your country.' For me, that answer is simple. Be Army strong and Army green."

POC is Jonelle Kimbrough, 910-396-3341, jonelle.k.thompson.ctr@mail.mil.

Jonelle Kimbrough is the media relations manager, Environmental Management, Fort Bragg. <IMCOM logo>



Fort Wainwright tests night lights for extreme conditions

by Bill Wood

At Fort Wainwright, near Fairbanks Alaska, with the exception of a few equipment rooms, cooling is not an issue. There's a lot of cold to go around. In contrast, heating is a life-or-death situation, so the Fort Wainwright Directorate of Public Works is pretty good at heating. But another challenge presented by the far north climate makes for some head scratching — upgrading exterior lighting to more efficient LEDs.

In Fairbanks during the summer, it doesn't get dark. This solar phenomenon makes Fairbanks a very interesting place to be in June and July. It also presents a unique challenge to the project manager tasked with installing new exterior lighting, as measuring lighting levels from newly installed equipment isn't possible.

Any lighting project incorporates some basic components including ensuring the installed lighting radius actually reaches and effectively illuminates the target area. In addition, cost issues must be considered, such as comparing installation and operational costs with the status quo. The analysis can be more art than science, but it generally requires some simple math, involving measuring current flow and lighting levels before and after the fact. Measuring current flow is straightforward, but measuring lighting levels, especially for outdoor projects, is made more complicated by Mother Nature's mood swings.

In addition to significant fluctuations in available ambient light, other uncontrollable factors impact lighting levels and can skew lighting measurement. In Fairbanks, the ground is covered in snow from mid-October through April. Significant amounts of light reflecting off the snow will confuse the light meter. Also, when daylight departs and snow comes, the temperature plummets. During the long Fairbanks winter, minus 40 F is not uncommon. These extreme temperatures cause bizarre reactions like ice fog, water turning hard and breaking pipes, and electronics acting strangely.

A major energy upgrade can be a high-risk endeavor if performance in extreme environments isn't fully known. Risk can be loosely defined as a large cost with an unknown benefit. Or, a little more specifically, as buying a lot of things that may or may not work, subjecting them to uncontrollable, extreme and unmeasurable variables, and checking the outcome after it has run its course. Whether it works won't be known till it's done. In addition, wild cards like operator tendencies and unproven technology further complicate the issue.

Technology solutions such as LED lighting come with promises of improved performance, often in the form of reduced costs. Energy savings is today's challenge, and technology is driving our capability to meet this challenge. Often, the energy-saving technology comes with a substantial up-front cost.

To make the project a little more economically palatable, Fort Wainwright decided to test the equipment for one full winter season before proceeding with an upgrade.

A lighting project's effectiveness can be measured by comparing each alternative's efficacy. In this case, efficacy is the amount of light generated per unit of energy expended. It is measured in lumens per watt and can be relatively easy to calculate — except with the variable-skewing properties of the Arctic summer.

To work through this difficulty, the project tasked the contractor with measuring the current draw on several selected lights using existing lighting and testing the current draw again using newly installed LED technology. That job is the easy part. The contractor will also install various LEDs and take their light meter measurements at specified times throughout the winter.

Lighting levels will be measured during times of complete darkness with no moonlight and minimized ambient light. In addition, a controlled environment,



Fort Wainwright will test outdoor LED fixtures over the winter to see how well they perform in Alaska's extreme conditions. Photo by Sean Bogren


likely inside an unheated storage shed, will be set up to take measurements without factors such as ambient light and snow reflection in the equation.

Lighting levels will be measured about once per month through the winter. These measurements will allow efficacy calculations for both the existing and the new lights. Light measurements will also be analyzed to look for indicators such as decreasing light levels, which may suggest the technology won't perform optimally in this environment.

If the tests indicate the technology is performing as advertised, and if the efficacy improvement warrants a significant investment, Fort Wainwright can justify upgrading the majority of its exterior lighting using the tested equipment. Significant energy savings are possible, but only if the new technology will work in the environment.

An "ops-check" in this instance is time and money well spent. Buying a lot of things and subjecting them to uncontrollable, extreme and unmeasurable variables is less painful than it seems. And if in doubt, always figure the efficacy!

POC is Bill Wood, 907-361-9663, william.r.wood36.civ@mail.mil.

Bill Wood, PMP, is chief, Engineering Operations Branch, Directorate of Public Works, Fort Wainwright. 



West Point's new science center helps Cadets reach for the stars

by JoAnne Castagna

In the late 1960s, young Robert “Shane” Kimbrough watched astronauts walk on the moon. As he gazed at his TV screen in awe, he set his sights on becoming one of them. Today, as Kimbrough, a NASA astronaut and active duty Army colonel, looks back, he believes that the science education he received at the U.S. Military Academy at West Point, N.Y., helped him reach his dreams.

The academy's science education is about to get even better. The U.S. Army Corps of Engineers' New York District is constructing a science center for academy Cadets that is maintaining the look of the historic 200-year old campus and taking science education well into the 21st century.

The academy is known as one of the world's preeminent leader development institutions. It has graduated two U.S. presidents, numerous famous generals, 74 Medal of Honor recipients and many successful NASA astronauts, like Kimbrough who graduated in 1989.

“The science education I received piqued my interest and made me want to do things I normally didn't think of doing,” Kimbrough said. “It also was a huge foundation for me becoming an astronaut. The academy provided me an incredible physics, chemistry and biology education and skills in problem solving and

experimentation techniques, all of which are invaluable skills I need as an Army officer and NASA astronaut.”

At NASA, science is important, said Kimbrough, who flew on the space shuttle and performed several spacewalks.

“We have to be able to launch a vehicle and people into space, space walk, perform work in orbit and get the crew back home safely,” he said. “All of this is science and math. I had a great background at West Point, so it helped me to understand all of this better than most folks.”

The old science building and equipment were outdated, and the academy wanted to stay competitive with other educational institutions of the same caliber. The Army Corps is constructing the new science center by renovating and combining two existing buildings — the old science building, Bartlett Hall, originally constructed in 1913, and the nearby old library.

Since the campus is a national historic landmark and home to many historic sites, buildings and monuments, the gray and black granite shells of both neogothic buildings are being kept intact.



West Point Cadets work on experiments in a new lab in an already renovated area of the science center. Photos by JoAnne Castagna

Both building interiors are being gutted, renovated and connected to create one large science center.

The new facility will be an expanded and modernized multi-purpose science facility that will sit on 300,000 square feet of property. The complex will have larger classrooms and labs. New equipment will help the Cadets study physics, optics, laser technology, chemistry, life sciences, biology and biochemistry.

“At West Point, we encourage the Cadets to perform hands-on science experiments, and this building's new design is helping us expand on this,” said Col. John Graham, academy associate dean for research and chief scientist.

“The Army Corps is taking this opportunity to rethink how the science needs to be taught,” Graham said. “Instead of having five or 10 Cadets doing the same experiment, two are now doing it. This is amazing. Whenever you do science in a large group, obviously someone always gets left behind in the group, but when there are two, they both can play an active role in the work. We are revolutionizing how we do science here.”

Graham, a West Point graduate, added that classroom experiments had been limited by the facility, but that will change with the new science center. For



The science center at West Point is undergoing extensive renovation and expansion.



Fort Carson Resiliency Campus: Constructing as a team

by Joe Wyka

The recently completed Fort Carson (Colo.) Resiliency Campus represents a different way of doing construction on an Army post. The project integrates a behavioral health center, a world-class gymnasium and wellness center, and a “chaplain forward” space into a comprehensive resiliency campus that focuses on the Army’s wellness pillars of mind, body and spirit.

The campus included three projects funded with Army Sustainment, Restoration and Modernization funds and three Military Construction Program projects. The campus approach involved a

larger and more diverse team than is typically formed. The Fort Carson Directorate of Public Works and the local U.S. Army Corps of Engineers staff formed the nucleus of this team.



Ironhorse Fitness Center, part of the Fort Carson Resiliency Campus, is open to Soldiers, Family members and Civilians. Photo by Susan C. Galentine

The Corps had responsibility for projects in both its resident and restationing offices, so it designated the program manager forward as the proponent synchronizing both efforts throughout the project. This arrangement provided continuity over several years of construction.

The geographic information system

contractor proved to be a key player as well. It integrated multiple sets of mapping on different scales and different coordinate systems to provide a cohesive master site plan.

Planning started in earnest when the three MILCON projects were awarded and final site decisions were made. ➤

Acronyms and Abbreviations

DPW	Directorate of Public Works
MILCON	Military Construction
SRM	Sustainment, Restoration and Modernization

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example, piping will be placed strategically so that Cadets can move fluids around during chemistry experiments, and outlets will allow for computer use in the labs.

The Cadets are already benefiting. One area of the construction site is being renovated while classes are safely taking place in another area, allowing the Cadets to complete their courses without delay due to construction.

In addition to preserving the building’s granite exteriors and the glazed leaded glass paned windows, the Corps is also preserving some of the interior stone walls, marble, slate, wrought iron railings, tile flooring, a staircase and ceiling archways.

“The goal for historic integrity is not to try to copy or mimic,” said Jeffery Friese, senior project engineer, New York District. “It’s to try to blend in and replicate and make it look new but still take on some of the details of the old architecture.”

Doing this is not easy, said Friese.

“It’s very challenging to just gut the interior and leave the exterior,” he said. “This is especially so when you have limited access to the building because there is limited space around the building, limited areas to get in and out of the building and when there is an occupied building next door. This is a very congested area of the post.”

Another challenge for the engineers is the wiring.

“When you turn a library into a science building, there is just no ceiling space for all of the wiring,” said Timothy Cain, project engineer, New York District.

“It’s a challenge to coordinate and organize all of the wiring, science lab items, utilities and plumbing in the ceiling,” Cain said. “It was a massive coordination effort to get everything to fit and everything to layout the way we liked it.”


The building may appear untouched from the outside, but it will be much safer. The Army Corps is removing asbestos

and lead paint, providing handicap accessibility, improving the air ventilation system, installing a new roof, improving the building information systems and installing shatter-proof windows on the interior side of the old leaded glass paned windows that will improve energy efficiency and prevent glass shatter from earthquakes.

The project is expected to be completed in 2016.

“I think a center like this will spark the interest of so many Cadets,” Kimbrough said, “and years from now, they’ll look back, and they’ll be asked why they’re doing what they’re doing now, and they will say, because of that science center that was built at West Point. I think the future is really bright, and it’s only going to be brighter now.”

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

JoAnne Castagna, Ed.D., is a public affairs specialist and writer, New York District, U.S. Army Corps of Engineers. 



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Early decision making centered on getting the right buildings sited next to each other. The planning team proceeded with the goal of creating a resiliency campus. Siting this campus would be a departure from the standard practice of siting each building in its own footprint with limited consideration of the adjoining buildings and uses.

As the design and planning teams convened in the early stages, they crafted criteria to guide development:

- make the development pedestrian and bike friendly;
- develop green corridors;
- connect buildings, parking and common areas with a defined trail network;
- synchronize plantings and architectural features to develop a coherent campus; and
- develop shared spaces that benefit multiple users.

The team learned several lessons along the way.

Early mapping is essential – The existing DPW process for updating mapping typically involved waiting for as-built drawings and some field verification. This process is too slow when planning a campus with multiple projects in various stages of planning and construction.

The team adapted a process to “rough-in” existing drawings and features and meld them into a consolidated base map. Although not perfect, the map provided enough detail to move forward with planning for pedestrian paths and sidewalks, and identified conflicts in adjoining sites.

This method required the MILCON project managers and engineers to present the construction drawings early and provide quality control on input into the master site plan. The DPW maintained the master site plan throughout the project, updating it as construction progressed and more

detail became available, allowing the team to quickly identify and track disconnects in the plan in time to affect change on individual projects.

Look at the ground from a pedestrian viewpoint – Throughout the campus development, the team focused on building a pedestrian-friendly area. Getting people out of cars was a unifying design principle. This goal required each project member to get out on the ground frequently before and during construction to identify opportunities for intuitive, simple pedestrian connections.

The DPW took the lead in developing an integrating project that captured the pieces of sidewalk, multi-use trail and roadway that did not fit neatly into one of the existing MILCON or SRM projects. This project was designed internally by DPW engineers and was modified several times through construction as more detail became available. This contract and the close attention of the engineers working it provided maximum flexibility to tie loose ends together. The endstate was a comprehensive pedestrian network without the gaps often found when nearby projects fail to connect efficiently.

Mind the details – “Success is the sum of details,” Harvey S. Firestone said. When building a pedestrian-friendly campus, every detail makes a difference.

The type of luminary, the font of a sign, the angle of a park bench or the positioning of a tree are all easily noticed by a person on foot. While maintaining an efficient and simple traffic pattern for vehicles, the team focused on details for a walking user.

Designers equipped the Forrest Resiliency Center, one of the campus facilities, with an innovative cul-de-sac turnaround to access the front of the building instead of a parking lot. The campus signage was attractively rendered in laser-cut steel plates with a Western font, a nod to Colorado’s past. Each crosswalk was carefully positioned, bollards were

emplaced to protect users from vehicle traffic, and even tree species and plantings were coordinated to present a cohesive appearance.


Develop a solution that works for most everyone – Aside from the usual stakeholders such as the contractors, building users and visitors, the team sought additional important input. The Fort Carson Directorate of Emergency Services provided valuable information on vehicle access and emergency response requirements. The privatized base operations contractor and base operations staff reviewed the sprinkler systems, paths, plantings, lighting and other components that would fall under its maintenance responsibility after turnover. The DPW Environmental Division provided guidance and assistance as the team developed low-impact features to improve storm-water treatment.

The staffs of the new facilities were invited to provide reviews and input to the plan at key junctures. For instance, a walking path between the child development center and the behavioral health clinic required a privacy wall to enhance the mission of both facilities. A local business donated a water feature that formed a centerpiece for the resiliency campus commons area. This placement required coordination to tie this enhancement into the campus.

The endstates for the project were twofold:

- a development with a campus feel that effectively ties together multiple facilities and functions into a cohesive whole; and
- a team of DPW and Corps engineers and planners who are now more effective at planning large-scale developments and ready to take this expertise into future projects.

POC is Joe Wyka, 719-502-5071, joseph.e.wyka.civ@mail.mil .

Joe Wyka is the chief, Engineering Division, DPW, Fort Carson. 



Fort Campbell maps the way to a renewable future

by Rick McCoy

To paraphrase the British Army's 7-Ps, "Positive pre-planning prevents pitiful poor performance." At Fort Campbell, Ky., this mindset resulted in a robust plan to deliver utility grade renewable energy that acts as a road map showing the way to achieve the goal. The end product spells out each component required to generate the needed megawatts and also paints the picture of how each renewable component connects to the existing utility infrastructure.

How did Fort Campbell get there? It wasn't as difficult as you might think.

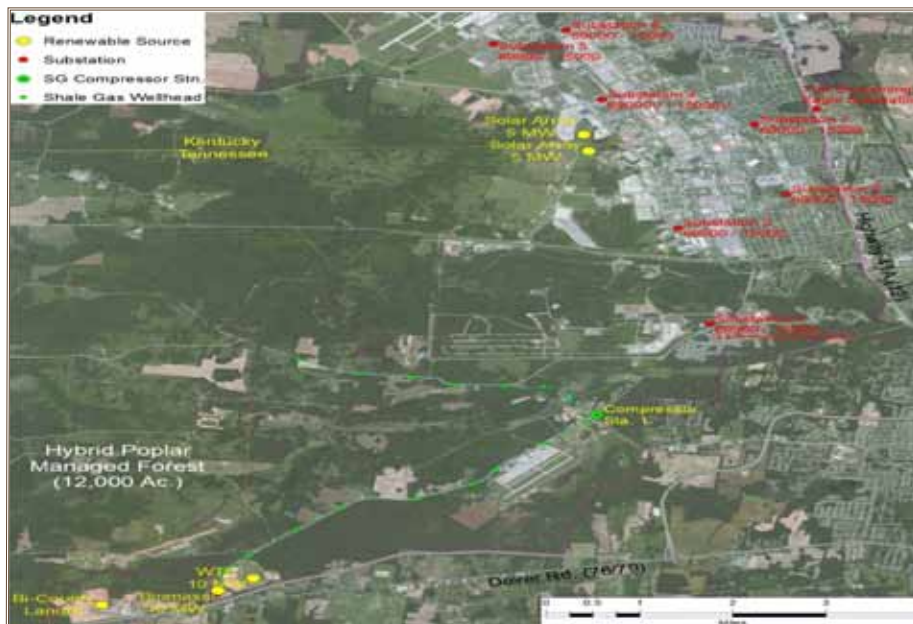
The most difficult task was getting started. As any good planner knows, it's important to begin with the end in mind, i.e., establish the target. The target resulted from applying the American Renewable Energy Act to Fort Campbell's energy demand. This federal standard requires agencies to obtain 25 percent of their energy from renewable sources by 2025. This goal requires Fort Campbell to produce between 15 and 20 mW of utility-grade energy. Target identified.

Since the target was to obtain utility-grade energy, Fort Campbell naturally focused on energy sources capable of supplying the required energy levels in the geographic area. This filter limits Fort Campbell to solar, biomass, gasification and shale gas.

Each source was validated for possible use at Fort Campbell. Grading characteristics included:

- cost
- contribution to energy island concept,
- impact to carbon footprint,
- contribution to net-zero goals,
- compliance with energy and environmental laws,
- interface with existing distribution systems, and
- funding scheme.

Planners assembled a team of subject matter experts using a contracting vehicle



A map displays Fort Campbell's potential renewable energy sources. Graphic by Oak Ridge National Laboratories

through the Department of Energy and Oak Ridge National Laboratories. The in-house workforce already possessed a good understanding of renewable energy, but working with the DoE and its prequalified experts helped the Fort Campbell staff to validate and package its ideas.

The DoE experts were asked to evaluate possible renewable opportunities and run a strengths, weaknesses, opportunities and threats analysis on each technology to validate the integrity of the option. Process 1 evaluated the post's available resources. Process 2 identified available technology to support the need. Process 3 evaluated the post's infrastructure. Process 4 evaluated the technologies' economic viability, and Process 5 created the energy security recommendation and road map for implementation over time.

The plan includes a 10 mW solar array, a 10 mW woody biomass plant, a 10 mW gasification plant and enough shale gas to provide the summertime demand of 988,000 MBtu per day. Achieving just one-half of this renewable road map will

meet the mandates and, at the same time, enhance Fort Campbell's capabilities and operations through energy efficiency and security in support of Installation Management Command's Line of Effort 6.

Fort Campbell's keys to success require change, and the staff is working hard to prepare for the days ahead. They know that a plan without follow-through is just a plan. They are already executing this plan and are on schedule to deliver a contract to begin extracting shale gas in early fiscal 2013.

The plan is a living document, and the team members will revise it as they get smarter. With this approach, Fort Campbell is on the road to a renewable future.

POC is Rick McCoy, 270-412-0389, james.rmccoy76.civ@mail.mil

Rick McCoy, P.E., C.E.M., is the garrison energy manager, Directorate of Public Works,

Acronyms and Abbreviations	
DoE	Department of Energy



At Daegu, master planning in the southeast enduring hub

by John M. Mathews

The U.S. Army Garrison Daegu director of Public Works, James C. Hamilton III, transformed master planning for the U.S. Army's southeast enduring hub in the Republic of Korea in 2006. Hamilton piloted parallel planning efforts that seized complex and dynamic development opportunities while also defining a long-range vision that better provides for the Army's enduring mission in Korea and the garrison's support of that mission.

Urban encroachment, aging infrastructure

Hamilton faced challenges. USAG Daegu provides installation support services for the Army in southeast ROK, defined by U.S. Forces Korea as Area IV. The USAG Daegu area of responsibility comprises Camps Walker, Henry and George in Daegu; Camp Carroll in Waegwan; multiple properties in Busan; and more than a dozen other facilities. These sites provide the facilities that support the joint forces logistics and theater sustainment mission in South Korea.

The bases coexist with their Korean neighbors within extremely dense cities. Busan and Daegu are the second and third most populated cities, respectively, in the ROK. Over the last two decades, the cities almost literally exploded around the camps. While the cities grew, the U.S. Army infrastructure did not change.

A quick glance at USAG Daegu installations reveals dispersed temporary or semipermanent single-story buildings. By contrast, the surrounding developments often tower to more than 20 stories. In addition, the areas around the bases include significant transportation infrastructure.

The perceived underuse of U.S. military facilities and the need to expand have created a political push toward additional encroachment. The municipal governments, working with ROK leadership, apply steady pressure to reclaim land as does the U.S.-ROK Land Partnership Plan.

The Land Partnership Plan forms a key element of a much larger effort, the ROK-U.S. alliance transformation. As the ROK Army assumes a greater role in its own defense, the U.S. Army in other parts of the peninsula will relocate and consolidate.

A significant portion of those U.S. forces will move to Camp Humphreys in Pyongtaek. This move includes a multi-billion dollar construction effort, mostly ROK government funded. USAG Humphreys will be a master planned community that provides the U.S. military with facilities on par with current U.S. standards.

On a much smaller scale, Area IV received some Military Construction funding as well. The Area IV Military Construction did not approach the Camp Humphreys scope, but the challenge was no less complex. Due to encroachment, Camps Walker, Henry and Carroll had no developable sites for programmed projects. Hamilton recognized that Area IV needed to create a way to recapitalize.

Simultaneous-concurrent planning

In 2001, the Corps of Engineers and Parsons Corp. planners had developed a master plan for Daegu and Waegwan. The plan matched the local environs with dense high-rise unaccompanied and Family housing and included an almost 100 percent recapitalization of buildings. That plan never came to fruition, primarily due to cost and implementation concerns.

In 2006, Hamilton dusted off that plan but quickly realized that it was outdated. While the concepts remained realistic, conditions had changed. The DPW needed a new plan.



Camp Walker is surrounded by high-rise development and urban encroachment.

He considered updating the plan with the garrison planning staff, but there were insufficient resources to perform this work. The small Daegu DPW planning team faced significant ongoing challenges in responding to unit space requirements and Army facility status and construction reporting. The absence of a valid master plan on which to base real property management and investment decisions compounded these challenges.

Hamilton recognized the need for master planning that could stay current with dynamic conditions while simultaneously providing a long-range vision to inform incremental decision making. The DPW master planning team required the right information and tools to support short-term decisions and provide for long-term improvements.

Garrison leadership first returned to the Corps of Engineers' Far East District. The district enlisted one of its star Status of Forces Agreement design contractors, Thomas J. Davis/Jung II, which brought Parsons back to the peninsula. With the original plan in hand, the DPW, with the help of Parsons, changed Area IV's master planning direction. ➤

Acronyms and Abbreviations

DPW	Directorate of Public Works
ROK	Republic of Korea
USAG	U.S. Army Garrison



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Hamilton initiated parallel-planning at this point. He employed the contractor to provide an outsider's look at the Area IV planning challenges and develop, define and refine a long-range facility investment strategy for USAG Daegu. At the same time, he focused the DPW planning staff on developing and programming key construction projects. He channeled the installation staff's energies toward working with the many organizations that provide funding authority.

In Area IV, construction funding comes from a variety or a combination of sources. Host nation funding remains a significant factor, but the Department of Defense Education Activity, the Defense Commissary Agency, the Exchange, Family and Morale Welfare and Recreation, and other sources contribute to Camps Walker and Carroll development. In addition, the industrial complex includes infrastructure for the 19th Expeditionary Sustainment Command, the Defense Logistics Agency and the Army Material Command.

With the staff concentrating on impending development, Parsons focused on evolving the planning process at USAG Daegu. In the past, master plans were produced sporadically with focus on the final report. Hamilton realized that the value of the large three-ring binder known as the master plan degraded over time.

The DPW and Parsons changed this perception within Area IV. A fundamental concept was adopted: "The Power of Planning is in the Process!" Participants gain from the planning process with ownership of a shared vision.

Since 2007, multiple planning studies for USAG Daegu have been completed. Each study builds on previous efforts, and each deliverable provides the additional details needed to make better investment decisions in support of the U.S. military mission, not only in Area IV but throughout the peninsula. More importantly, the contractor

continues to work with the DPW and garrison leadership to define and refine Area IV's long-range development plan.

During these efforts, Parsons has also consulted on short-term development decisions. It worked with installation stakeholders to define implementable development programs and projects that create modern facilities in the near term and provide for wholesale infrastructure recapitalization in the future. This shift toward long-term implementation made the development recommendations fiscally feasible.

Area IV's planning effort has not gone unnoticed. The Federal Planning Division of the American Planning Association awarded the Camp Walker Community Development Plan honorable mention in April for its originality and transferability. The planning effort centered on extensive community involvement that included outreach in the schools and public places such as the Exchange. Planners afforded the local population the opportunity to participate in focus groups, and the planning team launched a comprehensive online design preference survey. This effort reached beyond the traditional military base organizational structure and defined an enduring vision that should be sustainable through time and



A USAG Daegu master plan map shows the application of form-based code for future site development. Graphics and photo by Wayne Hausser



This artist rendering depicts Camp Henry after development.

leadership changes.

The Camp Walker plan stands as testament to Hamilton's master planning strategy. While refining the enduring vision for the installation through stakeholder engagement, the project team provided real-time assistance to the DPW staff with impending decisions. Together, they shifted a construction site for one of the installation's largest projects, a decision that supported the stakeholders' strong desire to conserve recreational space. In addition, the new location better facilitates future development in keeping with the long-range vision of a connected community.

POC is John M. Mathews, 315-768-8811, john.m.mathews@us.army.mil.

John M. Mathews is the chief, Master Planning Division, DPW, USAG Daegu.



Fort Belvoir's Pence Gate upgraded, ready for traffic

by Debra Valine

Testing of the largest active vehicle barrier system in the Army to date was completed in February for a \$17.1 million project at Fort Belvoir, Va., to upgrade six access control points and prepare them for the Automated Installation Entry System that will be installed later this year.

Improvements to Pence Gate were a small part of a larger effort that included work accomplished as part of Base Realignment and Closure as well as the Access Control Point Equipment Program. Work included installing the infrastructure and equipment required to support automated entry, a system that will validate identification cards against national databases to ensure the person is authorized to be there.

The BRAC portion of the project widened roadways and installed barriers and additional ID check lanes. The Access Control Points Program project placed guard booths, generators, barriers and other equipment at 13 traffic ID check lanes.

"Pence ACP is unique because of its terrain and real estate constraints," said Amber Martin, the ACPP manager at the U.S. Army Engineering and Support Center, Huntsville. "The hospital site and other facility sites were close to the ACP, so a unique barrier solution had to be developed to ensure Army standards were met. The garrison chose this barrier solution from several other solutions presented."

The upgrades brought the ACPs up to Army standards. Guards will have a higher level of protection, and improved conditions will allow for more efficient processing of vehicles.

"The ACP is the first impression that employees and visitors have when entering the installation," Martin said. "They are areas where visitors can be helped if they need directions and are where guards can assess potential issues with vehicles trying to gain access to the installation. ACPs are

also the installation's first line of defense if there is an incident that the installation community needs to be protected against."

Partners in the project include: the U.S. Army Corps of Engineers' Baltimore District, Omaha District's Protective Design Center, Huntsville Center's Electronic Security Center of Expertise and ACPP, Fort Belvoir, the Office of the Provost Marshal General, the Product Manager – Force Protection Systems and Johnson Controls Inc.

"This project is important because ACPs are one of the tools that garrison commanders use to protect the people who protect us," Martin said.

The Corps of Engineers was tasked to field portable physical security equipment to all Army installations worldwide after 9/11. After fielding portable equipment, the program was tasked to place permanent equipment at the ACPs to better manage traffic flow while maintaining required security levels.

To date, 32 of 34 installations in the United States and 36 of 36 overseas installations have received equipment upgrades to 134 of the 138 funded ACPs. In addition, 17 installations have completed planning actions, and another eight installations have received safety system upgrades to their existing equipment. In all, the ACPP managed 95 projects worldwide.

ACPP has the contracting and management capabilities and experience to provide design services, equipment, and infrastructure upgrades and maintenance to ACPs worldwide. The program is experienced and capable in executing ACP



For Belvoir's Pence Gate awaits ACP upgrades. Photos by Marcuis Wade, Johnson Controls



After the upgrades are installed, Fort Belvoir's Pence Gate is ready for automated entry.

design, construction and maintenance projects in accordance with applicable Department of Defense and service-specific standards.

Huntsville Center's ACPP has also been executing a centrally funded program called the Access Control Point Equipment Program in accordance with the priorities of OPMG for more than 10 years.

POC is Amber Martin, 256-895-1834, amber.d.martin@usace.army.mil.

Debra Valine is the chief, Public Affairs, Huntsville Center.

Acronyms and Abbreviations	
ACP	access control point
ACPP	Access Control Point Program
BRAC	Base Realignment and Closure
OPMG	Office of the Provost Marshal General



Fort Campbell's chapel complex blessed with options

by Jon Fleshman

On time and under budget is just part of the story of the Fort Campbell, Ky., chapel complex. The rest of the story includes options like a world-class organ, grand and digital pianos, giant TV screens, a sound board, gliding rockers, children's furniture and kitchen appliances.

"We built in options to the original chapel contract that was based on the standard design," explained Louisville District's Nora Hawk, the Corps of Engineers' project manager for the recently completed chapel complex. "Whereas we use Military Construction funds for the base contract, we need to use Operations and Maintenance Army funds for the audiovisual and kitchen equipment, administrative furniture and mission unique furnishings options."

Hawk coordinated the \$130,000-plus contract for the Corps' Huntsville Engineering and Support Center to procure the administrative furniture and then went in search of the \$575,000 for the mission-unique equipment and furnishings. Project engineer Jason Phillips said Hawk used exceptional leadership in securing the additional funding that came as a grant from the Office of the Chief of Chaplains, Department of the Army, with assistance from Headquarters Installation Management Command.

The need for a new chapel was identified in 1988, but it took congressional action to make it a reality by getting it into the fiscal year 2010 budget, Hawk said. The \$8.4 million adapt-build contract was awarded in August 2010 to Infinite-Wyatt, a small business joint venture out of Coosada, Ala.

"The Fort Campbell Chapel Complex is an adaption of the 2004 Army standard design developed by the Omaha District Center of Standardization religious facility design team," explained Askelon Parker, the project's lead architect and a member of the Omaha District center.

"One purpose of the standard design



Soldiers and Army Families worship on Easter in Fort Campbell's new chapel. Photo courtesy of Fort Campbell Chaplains Office

is to avoid any major functional changes to the program or floor plan that would inadvertently eliminate support for any faith group," Askelon explained. "For instance, the steeple is a typological feature used to identify the building as a religious, facility, but it does not denote any particular faith group."

One of the standard design options is a deliberate axis so the plan can be mirror-imaged to accommodate different site conditions, he said. The Fort Campbell chapel floor plan was flipped to align the main entrance with some existing site conditions. Chapel designs come in three sizes: 17,900 square feet for the "chapel" model, 22,600 square feet for the "chapel center," and 32,900 square feet for the "complex," like the newly built Fort Campbell facility.

The chapel complex was ready in time for Easter sunrise service, a baptism, a children's dedication and the Boogie Woogie Jesus Project from Nashville, Tenn., that inspired the 575 Soldiers

and Family members worshipping in the sanctuary at the 11 a.m. Easter service.

"Easter was our maiden voyage, and we did not hit an iceberg," said Chap. (Col.) Roger Heath. "We can now house a full battalion for a memorial ceremony, and we can also accommodate more and better child care."

Features that come with the new chapel that didn't exist within the older structures on post include more and better classrooms, a baptistery and a way to expand the sanctuary to accommodate from 600 to 1,000 people, Heath said.

The population supported by the Fort Campbell Chaplains' Office includes active-duty Soldiers, Family members, retirees and Reservists and totals more than 183,000.

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

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





Corps is home on the range

by Monique Ostermann

Range maintenance at active military installations involves a number of activities, including surface and subsurface clearances, debris removal and disposal, and target recycling and reconstruction. While many installations handle this work themselves, some have opted to bring in one of the U.S. Army Corps of Engineers Military Munitions Design Centers to assist.

USACE has MMDCs located in Baltimore; Huntsville, Ala; and Omaha, Neb. A fourth MMDC, the Range Support Center, is a regional organization that draws on the resources of five USACE districts: Albuquerque, Fort Worth, Los Angeles, Sacramento and Tulsa.

For each range maintenance effort, the USACE MMDC develops a project team to meet the unique conditions of the installation's ranges. Two installations that rely on USACE for their range maintenance programs are Joint Base Lewis-McChord, Wash., and Fort Irwin, Calif.

Lewis-McChord

RSC has successfully managed range maintenance projects at Lewis-McChord since 2008 and also assists with prioritizing range projects, developing scopes of work and awarding contracts.

The projects encompass the full array of range maintenance tasks needed by military training facilities — geophysical surveys, intrusive investigations of anomalies, surface and subsurface clearances, removal and recycling of unserviceable targets and target debris, construction and emplacement of silhouette-style targets, surface and subsurface sweeps along target access routes and placement locations to identify unexploded ordnance or munitions and explosives of concern, repair and replacement of firing positions and reorientation of ranges. Most importantly, RSC has on-site staff to manage contractor fieldwork and to ensure that it is performed correctly and safely.

RSC has also worked with the Lewis-McChord Range Maintenance Office to develop a list of range projects and associated cost estimates for each project. This list has become a tool that enables the RMO to prioritize work and develop program budgets. Carl Ramsey, range facilities manager, has found the project list to be integral in obtaining funding.

“We now have a task order list of prenegotiated items that can be contracted as money comes available, even if it’s at the very last minute,” Ramsey said. Because of USACE efforts, Lewis-McChord has been able to use year-end money to take several UXO projects from almost ground zero to contract signed.

Irwin

At Fort Irwin, RSC executes range maintenance work to safely locate, identify, mark and dispose of munitions and explosives, and also supports target removal and construction tasks. In addition, the USACE contractor collects, inspects, removes and processes material potentially presenting an explosive hazard and metal range residue for recycling and disposal.

Fort Irwin counted on its recycling initiative to directly offset contractor costs, since the RMO historically received \$4.7 million in funding and annual contracts run between \$5 million and \$7 million. The fort's recycling operations have involved surface clearance and collection of material potentially presenting an explosive hazard; classification of it as either material documented as safe, known as MDAS, or material documented as an explosive hazard; demilitarization and mutilation of MDAS; and segregation of processed MDAS into the recyclable components of aluminum, steel, mixed metal and expended small arms cartridge cases.

Acronyms and Abbreviations	
MDAS	material documented as safe
MMDC	military munitions design center
RSC	Range Support Center
RMO	Range Maintenance Office
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

Although Fort Irwin had high expectations for the recycling initiative, revenue was 8 percent of what was anticipated, and so it tasked USACE, which was already managing the contractor's surface clearance work, demolition activities and processing of recyclables, with identifying ways to make the recycling operation more profitable.

RSC found two primary reasons for the lower-than-expected revenues from the innovative program. The first challenge was volatility in the recyclables market. To increase profits, RSC recommended that Fort Irwin start a store-and-hold



At Fort Irwin, a 90mm projectile is demilitarized before the metals are separated and sold as scrap. Photo by Versar Inc.



At Joint Base Lewis-McChord, shears are used to cut tank tracks and other smaller pieces. Photo by Billy J. Allen



Need to evaluate archaeological sites? Help is here

by Carey Baxter

Your installation wants to build a new training range on several acres not previously developed. One section of the proposed site may have once been a settlement or burial ground for a historic culture, a supposition based on artifacts that have surfaced over the years. As a cultural resources manager, you know this area must be evaluated in detail to comply with the National Historic Preservation Act.

Where do you start?

A Public Works Technical Bulletin issued by the U.S. Army Corps of Engineers helps demystify the process of evaluating and documenting archival information about historic sites. PWTB 200-1-108, *Guidance on Effective Archival Research in the Evaluation of National Register Eligibility of Archaeological Sites*, is available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_108.pdf.

Compliance with NHPA and Army Regulation 200-1 typically requires an agency to identify historic properties within an area that may be impacted by a proposed activity and to evaluate their eligibility for nomination to the National Registry of Historic Places. In cases of properties dating to the historic period, this evaluation often includes investigation of

all available archived information relevant to the site.

Archival research is fundamental to interpreting and evaluating historic sites. Archival records include archaeological site forms; reports of cultural resource management investigations; historic county atlases and plat maps; tax, census and probate records; historic photographs; early aerial photographs; and journals, diaries, bibles, correspondence and other related — usually unpublished — documents. These materials are typically scattered throughout many locations, such as military installations, Corps district offices, State Historic Preservation Offices, genealogical websites, state and local libraries and historical societies, county court houses and the National Archives in Washington, D.C.

The PWTB provides useful pointers for identifying resources and collecting archived materials that can become part of the historic evaluation. Because of the time and travel expenses that can be incurred with archival research, the document offers guidance for doing preliminary searches to screen possibly hundreds of documents and focus legwork on only those sources that look the most promising.

The PWTB contains several appendices with additional information, including:

- potential benefits of archival research;
- the need and methods for conducting a preliminary evaluation of secondary sources prior to the search for



Jerry Lilly, a CERL contractor archeologist, makes notes at the original Cape Canaveral Lighthouse remains, which were located through archival research. Photo courtesy of CERL.

archived information;

- types of primary documents that a researcher may encounter in archival research, types of archival repositories and the types of documents they contain;
- procedures used at selected archival repositories;
- methods the researcher should use in primary text and graphic (map) documents; and
- procedures and data sources for genealogical research.

POC is Carey Baxter, 217-373-4454, carey.l.baxter@usace.army.mil.

Carey Baxter is a research archaeologist, U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.

Acronyms and Abbreviations

CERL	Construction Engineering Research Laboratory
NHPA	National Historic Preservation Act
PWTB	Public Works Technical Bulletin

(continued from previous page)

strategy to take advantage of the market during upturns.

The second reason was that there is simply less munitions debris available to harvest. Since USACE had become involved, accessible ground had been systematically cleared — repeatedly in high-use areas. As a result, historical weights of munitions debris removed

from any one square kilometer were much higher than what is available today. Recent changes to training have also contributed to the decline in recyclable material.

RSC advised Fort Irwin that the current focus on the Iraq and Afghanistan missions have shifted the Army's emphasis away from "force-on-force" training, which has, in turn, reduced the amount of munitions debris on the ranges. Once the Army returns to the force-on-force

training model, the recycling program should become more viable.

Together, the two projects demonstrate that USACE MMDCs have experienced resources to assist with range maintenance work from project identification to successful completion.

POC is Monique Ostermann, 505-235-4061, Monique.M.Ostermann@usace.army.mil.



Bulletin describes actions to achieve water-efficient installations

by Richard J. Scholze

The U.S. Army Corps of Engineers released a Public Works Technical Bulletin promoting water efficiency and methods to achieve it. PWTB 200-1-105, *Water Efficient Installations*, is available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_105.pdf.

Army installations spend some \$67 million for water, more than that for sewage treatment and additional costs for energy to heat and distribute the water. To help reduce vulnerability to water shortages, the *Army Energy Security Implementation Strategy* calls for a culture of accountability for conservation and for effectively including goals to reduce water consumption. Federal and Army mandates have been initiated to reduce annual consumption, including the Army's initiative to be net-zero water, energy and waste by 2020.

The PWTB describes regulations and drivers impacting water efficiency; methods and best management practices; experience at Army installations; water reuse practices; and a specific example for an individual installation. Readers are also encouraged to view an accompanying PWTB addressing water conservation programs. (*Editor's note: See sidebar.*)

The largest water consumer on most installations is irrigation for the large expanses of parade grounds, parks and recreation areas, athletic fields, golf

courses, cemeteries and landscaped grounds. In addition, Family housing, industrial, institutional and barracks buildings also use water, primarily for domestic wastewater. Other major water users are hospitals, laboratories and dining facilities. Central vehicle wash facilities, which are used to clean tracked and wheeled vehicles, have specific processes for recycling water.

The PWTB uses the Federal Energy Management Program Best Management Practice listing as the starting point in describing water efficiency practices. That guide was selected for consistency with federal approaches rather than utility, trade or consumer groups, which use differing classification schemes for similar options.

The selected categories are:

- Water Management Planning
- Information and Education Programs;
- Distribution System Audits, Leak Detection and Repair;
- Water-Efficient Landscaping;
- Water-Efficient Irrigation;
- Toilets and Urinals;
- Faucets and Showerheads;
- Boiler and Steam Systems;
- Single-Pass Cooling Equipment;
- Cooling Tower Management;



Catastrophic loss of water from main breaks like this one can be prevented with distribution system audits to locate and repair water leaks. Photo courtesy of City of Columbus, Ohio

- Commercial Kitchen Management;
- Laboratory and Medical Equipment;
- Other Water-Intensive Processes; and
- Alternate Water Sources.

Selected topics are mentioned below but receive additional depth in the PWTB.

Information and Education Programs are essential if water-efficiency technologies and methods are to be successful. Installing a retrofit or water-saving technology in a facility is not enough. New operating procedures, retrofits and replacements are most effective when employees, contractors and the public know what the new technology is and how to use it properly.

Distribution System Audits, Leak Detection and Repair help installations reduce water losses and make better use of limited water resources. Surveys and repair can lessen water losses, which stretches existing supplies to meet increasing demand. This measure could defer construction of new water facilities. Additional benefits include lower operating costs, reduced property damage and better accounting. Many installations may lose more than 10 percent of their potable water.

Water-Efficient Landscaping has two primary facets: design a landscape that

Acronyms and Abbreviations	
PWTB	Public Works Technical Bulletin

How to implement a water conservation program

by Richard J. Scholze

A companion PWTB offers more guidance for conserving water. PWTB 200-1-104, *Implementing a Water Conservation Program on Army Installations*, is available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_104.pdf and is intended to be used with PWTB 200-1-105.

This bulletin contains background on

water conservation practices and provides examples of typical conservation plan components. It describes how an audit should be conducted and provides a method to estimate water usage when the water supply is unmetered. The PWTB also offers guidance for focusing on specific goals while considering state and local requirements or special circumstances.



Bulletin offers guidance for monitoring archaeological sites

by Michael Hargrave

To comply with the National Historic Preservation Act and other mandates, installation cultural resource managers must identify and periodically monitor archaeological sites within the fence line. Because of the diversity inherent in these sites across the United States, a single monitoring strategy is not possible. The same is true of Army Corps of Engineers' lakes and waterways.

To help cultural resource managers develop site-specific strategies, a Corps of Engineers Public Works Technical Bulletin provides best practices that can be used to tailor a monitoring plan. PWTB 200-1-60, *Best Practices for Archaeological Site Monitoring*, is available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_60.pdf.

Archaeological site monitoring consists of periodic visitations and inspections to detect any change in a site's condition.

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requires minimal supplemental water and install an irrigation system that applies the appropriate amount of water efficiently.

Toilets and Urinals are significant water users. Replacement programs should follow the guidance of the Environmental Protection Agency's WaterSense program and use only high-efficiency fixtures for toilets, flush valves and urinals. Well received urinal options include waterless as well as one-pint and one-quart flush options (the existing standard is one gallon per flush).

Cooling Tower Management offers an important option to improve water efficiency. Increasing cycles of concentration and use of conductivity controllers are ways to improve efficiency.

Commercial Kitchen Management includes a large sector of users: dining facilities, hospitals and restaurants. Technologies such as pre-rinse spray valves, high-efficiency dishwashers and

Archaeological resources are vulnerable to both intentional and inadvertent damage from many sources, and the level of risk to individual sites is not static. Changes in access, e.g., new roads or trails, pool levels in lakes and rivers, the nature or location of military training, agricultural practices, urban and suburban expansion and even recreational activities can expose archaeological resources to new risks.

Archaeological site monitoring is often considered an activity that is important but less critical than site discovery and evaluation. Given limited funding, many cultural resources programs focus their monitoring efforts on a very

boilerless steamers improve conservation.

Alternate Water Sources present many opportunities. Municipally supplied reclaimed water, gray-water use, rainwater harvesting and use of air handling unit condensate are among the alternatives available to either reuse existing treated water or to capture and treat nontraditional water sources and use them beneficially. Many of these options can be cost effective within the proper context.

Water supply is finite. It is essential to squeeze maximum use out of the existing supply while supplementing that use with beneficial reuse in nonpotable applications in addition to being water efficient.

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

Richard J. Scholze is an environmental engineer and researcher, Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.



Archaeological monitoring often focuses only on highly visible sites, like this cave containing Native American artifacts, but all sites with historic value should be monitored. Photo by Dana Finney

narrow range of highly sensitive or highly visible sites, such as rock shelters, rock art, mounds, cemeteries and battlefields that are primarily threatened by looting and vandalism. These efforts may be adequate for those sites, depending on field protocols and data management, but highly selective monitoring is not really sufficient for compliance with the intent of relevant historic preservation laws.

The PWTB is divided into four chapters. The first explains how federal laws that represent the backbone of the nation's historic preservation and cultural resources programs imply the need for archaeological site monitoring. Several monitoring strategies judged to be sound and effective are summarized next. The third chapter discusses issues, variables and methods that should be considered by those developing an archaeological site monitoring plan for their own situations. A final chapter provides example monitoring forms that can be used with the best practices described in the second chapter.

POC is Michael Hargrave, 217-373-5858, Michael.I.hargrave@usace.army.mil.

Michael Hargrave is a research archaeologist, Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.



Cold-weather, low-emission vinyl coating applied in Alaska

by Dana Finney

A new type of vinyl coating system that can be applied in subfreezing temperatures also complies with emission standards for volatile organic compounds. The U.S. Army Engineer Research and Development Center,

Construction Engineering Research Laboratory demonstrated the coating on a bridge at Yukon Training Range, Alaska, and is continuing to monitor its performance.

Battling corrosion with coatings

Protective coatings are the primary method for preventing and controlling corrosion on steel structures at military bases. However, in the case of bridges, the coating systems must either be applied during warm weather or the section of the bridge being painted must be preheated. For cold regions, these constraints result in a small window of the year when work can be done, creating difficulty in completing projects and escalating the cost.

“The service life of a bridge coating depends on a number of things, including both the corrosivity of the environment as well as the amount of physical damage the surface receives, such as that from loose gravel being thrown by traffic,” said Al Beitelman, CERL researcher and director of the Corps of Engineers Paint Technology Center. “Even bridges on hard-surfaced roads need to be recoated in 15 to 20 years.”

Solution-type vinyl coatings have been used for decades to protect metal water structures such as locks, dams, bridges and ships. They have high levels of durability and a long service life. As lacquer coatings, they can be applied through an extremely wide

Acronyms and Abbreviations

CERL	Construction Engineering Research Laboratory
DPW	Directorate of Public Works
ERDC	Engineer Research and Development Center
VOC	volatile organic compound

temperature range. However, they also have an often unacceptably high level of VOCs, for which the Environmental Protection Agency sets emission standards.

In bench evaluations, the new technology showed promise of allowing vinyl to meet the most restrictive VOC regulations. The material can be manufactured with a high percentage of an exempt solvent to produce a sprayable vinyl coating with a VOC of less than 100 grams per liter. Since it can be applied in temperatures below 32 F, it extends the timeframe in which the recoating work can be done.

Fort Wainwright application

To demonstrate and validate the new coating system, CERL worked with the Fort Wainwright, Alaska, Directorate of Public Works to identify an appropriate steel structure to be repainted. The Department of Defense Corrosion Prevention and Control Program funded the project.

Fort Wainwright’s temperatures vary from a high of 94 F (1991) to a low of minus 66 F (1961). Yukon Training Range, situated south of the fort, is shared with Eielson Air Force Base. The Installation Management Command region named Yukon Training Range as the test location and coordinated with Wainwright DPW to select a specific Bailey bridge to be recoated.

The lead-based paint on the bridge had to be removed before the low-VOC coating system could be applied. To avoid contaminating water under the bridge or surrounding soil during removal, project managers used a crane to lift the bridge off of its embankment and place it on



The low-VOC coating is applied in cold temperatures using airless spray. Photos courtesy of ERDC-CERL



The Bailey bridge is lifted and moved to the roadway so that the cleaning and coating can be done away from the environmentally sensitive stream.



Bulletin aids in identifying archeological traits of soils

by Carl Carlson-Drexler

The Corps of Engineers issued a new Public Works Technical Bulletin that provides basic guidance to Army cultural resource managers and their consultants on how to recognize and interpret soils in archeological contexts. PWTB 200-1-98, *Guidance to Improve Archeological Interpretation of Soils*, is available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_98.pdf.

The PWTB should be viewed as a starting point for those who wish to expand their understanding of issues such as soil and sediment origins, horizons and descriptive terminology, and it lists resources for more in-depth reading. Knowledge of the soil-related factors involved in archeology will help cultural resource managers better understand the need for care of sites and for expert help when necessary. The ability to do so can inform management decisions about land use and help avoid spending funds to repair damage at important sites.

Army Regulation 200-1 and the National Historic Preservation Act require federal agencies to evaluate the potential

impact of proposed activities on any district, site, building, structure or object included in or eligible for listing in the National Register of Historic Places. For archeological sites, this evaluation often includes excavations designed to define a site's boundaries and to judge its integrity and historical or cultural significance relative to one or more historic contexts.

The PWTB offers five appendices that:

- discuss factors affecting formation of a soil's "A horizon;"
- explain factors contributing to subtle distinctions in the soil's strata;
- describe how to interpret strata as one aspect of the process to assess a site's historical integrity, significance and research potential;
- discuss color versus texture criteria for determining soil horizons; and
- present a brief overview of common chemical tests for soils to provide a better understanding of a site's past use.



Soil color is determined using a Munsell Book. Photo courtesy of Construction Engineering Research Laboratory

POC is Carl Carlson-Drexler, 217-373-4538, carl.carlson-drexler@usace.army.mil.

Carl Carlson-Drexler is an archeologist, U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory.



Acronyms and Abbreviations

PWTB	Public Works Technical Bulletin
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the adjacent road where a containment enclosure was built in place.

Before coating, all metal on the bridge was dry-abrasive blasted to Steel Structures Painting Council SP 10, "Near White Metal Blast Cleaning." Once the coating dried, the blasting waste was collected and disposed following regulatory requirements. The crane lifted the bridge back onto the embankment, approach ramps were replaced, and new wood planking was installed.

Performance validating

During the application process, the

research team also blast-cleaned 12 mild steel test coupons. They coated six of them at the same time as the bridge, while the rest were left uncoated. Then they mounted all of the coupons on a rack and positioned them at a 45-degree angle from the vertical, attaching the rack to the bridge so as to be exposed to the same sunlight and environmental conditions as the bridge.

At 12- and 24-month intervals, two each of the coated and uncoated coupons will be removed and delivered to the Paint Technology Center to assess the coating's performance, including an analysis of the cause and extent of any corrosion

that appears.

"The application went very smoothly," Beitelman said. "The coating dried within minutes, which allowed substructures to be handled without damaging the freshly applied coating. The coating has a pleasing appearance with excellent adhesion and is extremely tough. I do not expect it will need any touch-up or other maintenance for decades."

POC is Al Beitelman, 217-373-7237, alfred.d.beitelman@usace.army.mil.

Dana Finney is a public affairs specialist, ERDC-CERL, Champaign, Ill.



Know your hiring authorities and make them work for you

by Renee Benjamin and Rekisha White

You have approval to hire for that position you so desperately need to fill. The expected allocation of fiscal 2012 centrally funded intern positions will soon materialize. You want to fill positions with the best candidates possible. Several hiring authorities are available to help you hire that quality candidate.

Student Career Experience Program

SCEP provides permanent federal employment opportunities for students. The work must be directly related to the student's academic program and career goals. SCEP students may be noncompetitively converted to career, career-conditional or term appointment at the completion of their degree — diploma or certificate — and completion of at least 640 hours of work for the agency.

Student Temporary Employment Program

STEP provides temporary federal employment opportunities. The program does not require that the government work be in a field related to the student's education. STEP does not provide for a conversion to a permanent appointment, but students may be noncompetitively converted to SCEP.

Competitive examining

CE is the traditional method and the single largest authority for making appointments to competitive service positions. CE gives an agency a qualified workforce that represents the society it serves by assessing all interested, qualified U.S. citizens. Vacancies filled through the CE process are open to the public.

Pathways

The Pathways programs will replace the Federal Career Intern Program, STEP and SCEP, and will modify the Presidential Management Fellows. The Office of Personnel Management repealed the Federal Career Intern Program in March 2011. The STEP and SCEP programs will continue until the Pathways programs

are implemented.

The Internship Program will be for current students and will replace SCEP and STEP. The program will target students enrolled in a variety of educational institutions and provides paid opportunities to explore careers in federal agencies while still in school.

The Recent Graduates Program will target individuals who have recently graduated from qualifying educational institutions or programs. Successful applicants will be placed in a two-year career development program. Participants will be eligible for conversion to competitive service upon completion of all program requirements.

Presidential Management Fellows will be a flagship leadership development program at the entry level for advanced degree candidates. The program is designed to develop a cadre of potential government leaders.

OPM expects to implement the Pathways programs this year. For more information, visit <http://www.opm.gov/hiringreform/pathways/>.

Veterans' Recruitment Appointments

The VRA authority allows managers to appoint an eligible veteran without competition. The candidate does not have to be on a list of eligibles but must meet the position's basic qualification requirements. Under the VRA authority, agencies can appoint an eligible veteran noncompetitively to a position at any grade level through GS-11 or equivalent. VRA can be a good tool for filling entry-level to midlevel positions.

To be eligible, a veteran must:

- have a qualifying service-connected disability;
- have served on active duty in the armed forces during a declared war or in campaign or expedition for which a campaign badge has been authorized; and
- have participated in a U.S. military oper-

Acronyms and Abbreviations

CE	competitive examining
OPM	Office of Personnel Management
SCEP	Student Career Experience Program
STEP	Student Temporary Employment Program
VRA	Veterans' Recruitment Appointments

ation while on active duty for which an Armed Forces service medal was awarded or be separated from active duty within three years.

Merit promotions

Merit promotion refers to the placement, promotion, transfer, reassignment and other movement of competitive service employees. A primary objective is to staff Department of Defense components with the best qualified candidates while enhancing employees' careers by giving all employees a fair chance to compete for advancement. A Merit Promotion Program underlying principle is the identification, qualification, evaluation and selection of candidates based solely on job-related criteria.

Eligible veterans applying under the Veterans Employment Opportunity Authority must be allowed to apply for positions an agency announces under merit promotion procedures when the announcement is open outside of its own workforce. To be eligible for Veterans Employment Opportunity Authority, a candidate must be an honorably separated preference-eligible veteran or honorably ➤



At a recruitment fair, Army employers seek potential employees to be hired under various authorities. Photo courtesy of U.S. Army Corps of Engineers



Presentation advice

by Mary Beth Thompson

Have you sat in the audience when a presenter offers a slide so packed with words that it's impossible to read? The presenter invariably says, "I know you can't read this, but ..." Everyone is too polite to groan, but it boggles the mind why someone would prepare a slide he or she knows the audience can't read.

Whether you love or hate PowerPoint presentations, they are a fact of life. How do you tip your presentation, if not to the "love" side of the scale, at least to the level of interesting and useful for your audience?

Achieving that goal requires thought and work on your part, but it can be done. Here's some advice.

Tailor – Prepare the presentation for the

audience you will speak to. A presentation obviously prepared for another audience is a turnoff, and some will feel the insult that you did not bother to shape your presentation for their needs and interests.


Slide text – The entire audience, even the back row, should be able to read easily every word on your slides. Large blocks of text on a slide make the audience want to tune out.

Bullets – Synthesize the points you plan to make into bullets. Compose each bullet as a sentence fragment.

Talk, not read – Talk to the point made in each bullet. Presentations are oral interactions, not papers. They are about what you say, not what you wrote.

Acronyms, jargon, bureaucratese – Avoid them. In most situations, your acronyms, abbreviations and jargon will not be familiar to everyone in the audience. Do those who are not familiar a favor — spell out the words and use plain, direct language on your slides and in speaking.

Rehearse – Practice makes a much better presentation. Rehearsing helps you identify and fix glitches in your delivery and tamp down nervousness. Your smooth delivery will drive your messages home as it lets your audience know that they are important enough for you to have spent time preparing to speak to them.

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

In memory of Ronald Peter Diehl

Ron Diehl, long-time program manager and staff action officer in the Facility Policy Division, Office of the Assistant Chief of Staff for Installation Management, passed away June 12. Diehl had celebrated his 70th birthday the night before. At the time of his death, Diehl worked in the Energy and Utility Branch as the program manager for the Energy Conservation Investment Program and renewable energy projects.

"Ron was the personification of the ECIP — it was his entire focus," said Bob Sperberg, chief, Facilities Policy Division. "Under his leadership, program performance and accountability improved, and the Army's share of the annual ECIP appropriation steadily increased.

"Working with the Corps of Engineers offices in Washington and Huntsville, and

the Department of Energy laboratories, Ron and his team developed the first ever ECIP future-year development plan. The Office of the Secretary of Defense embraced his new management approach, and now, all the services are developing similar five-year plans."

Sperberg called Diehl a role model for all program managers.

"Ron was a professional and always had a ready smile in spite of the situation," said David Purcell, chief, Energy and Utility Branch.

"Ron will be missed by all of us," said Paul Volkman of the Office of the Assistant Secretary of the Army for Installations, Energy and Environment. "He was a real champion of the ECIP and a stout supporter of helping the



Ron Diehl
Courtesy photo

net-zero installations."

Diehl earned his civil engineering degree from Michigan State University. His Department of Defense career began in 1975. He worked for the U.S. Army Corp of Engineers, the Defense Logistics Agency and Walter Reed Army Medical Center before joining OACSIM.

This article was adapted from information provided by Facilities Policy Division, OACSIM. 

Acronyms and Abbreviations


ECIP	Energy Conservation Investment Program
OACSIM	Office of the Assistant Chief of Staff for Installation Management

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separated veteran after three years or more of continuous active service.

Managers are encouraged to speak with their Civilian Personnel Advisory Center human resources specialist to find the best fit for their recruitment needs.

POC is Rekisha White, 202-761-1698, rekisha.i.white@usace.army.mil

Renee Benjamin is a human resources specialist, Civilian Personnel Advisory Center; and Rekisha White is a human resources specialist, Headquarters U.S. Army Corps of Engineers. 

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

