

Public Works

DIGEST

Volume XXVI, No. 3
July/August/September 2014

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

Leader
Commentaries 3

Operations,
Maintenance and
Engineering 8

Sustainability 32

Technology and
News 33

Professional
Development 41



Company A, 249th Engineer Battalion (Prime Power), U.S. Army Corps of Engineers, completes joint training with the Directorate of Public Works, U.S. Army Garrison, Hawaii. Full story on page 8.





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

Public Works Digest is an unofficial publication of the U.S. Army Installation Management Command, under AR 360-1, The Army Public Affairs Program. Method of reproduction: photo-offset; press run: 1,600; estimated readership: 5,000. Editorial views and opinions expressed are not necessarily those of the Department of the Army. Mention of specific vendors does not constitute endorsement by the Department of the Army or any element thereof.

Gregg Chislett

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

Kathye Gerrity-Milthram

Managing Editor,
U.S. Army Corps of Engineers
Headquarters, USACE
441 G Street, NW
Washington, DC 20314-1000
202-761-0022 DSN 763
editor.pwdigest@usace.army.mil



Printed on recycled
paper.

Leader Commentaries

- 3 How Fort Hood DPW is supporting the Ready and Resilient Campaign, *by Brian L. Dosa*
- 6 Communication and Commitment Keep Fort Hood Projects Running Smoothly, *by Colonel Charles H. Klinge and Randy Cephus*



Operations, Maintenance and Engineering

- 8 Leveraging Partnerships Helps Cope with Diminishing Resources - 249th Engineer Battalion aids USAG-Hawaii's DPW, *by Sally Ciereszko*
- 9 USACE, DODDS Take Aim at Aging Schools in Europe, *by Vince Little*
- 11 Army Corrections Facility in Europe Set for Move to Sembach, *by Vince Little*
- 12 Partnering for a Sustainable Future, *by Heather Burke*
- 13 Europe Transformation, Construction Oversight Key Themes at Annual Forum, *by Vince Little*
- 14 The Army Reserve Gets the Gold, *by Stewart R. Fearon*
- 16 Historic School Graduates to the 21st Century, *by JoAnne Castagna*
- 17 Harvesting Rain and Sun at Fort Sill, Oklahoma, *by Sara Goodeyon*
- 18 Lock and Dam 22 Dewatered for Winter, *by Allen Marshall*
- 19 USAG Stuttgart Reduces Installation's CO₂ Emissions by 60 percent, *by Christian Dengel*
- 20 Corps Looking for New Ways to Save Energy at Joint Base Lewis-McChord, *by Tanya King*
- 22 Preventative Maintenance - Provides Facility Dependability and Energy Savings, *by John Ramey*
- 23 Corps Delivers Solar-Powered Elementary School to Fort Stewart, *by Tracy Robillard*
- 24 Huntsville Center Offers Fast Track, Efficient Facilities Repair, Renewal Services, *by Dominic Ragucci*
- 25 Huntsville Center's Operation and Maintenance Engineering Enhancement Program: A Tool for Meeting Defense Department Medical Facility Maintenance Needs, *by Mike Hunter and Crystal Bennett Echols*
- 27 Project Maintenance - Cavitation Repairs, *by Eileen Williamson*
- 28 Multi-Agency Team Manages Careful Excavation at 4825 Glenbrook Road, *by Brenda Barber, Clem Gaines and Andrea Takash*
- 30 Fort Leonard Wood Focuses on Water Sustainability, *by Elisabeth Jenicke and Jeannie Elseman*
- 31 82nd Airborne Division Museum Achieves Green Certification, *by Jonelle Kimbrough*



Sustainability

- 32 Photovoltaic Technology in the Huntington District, *by Brian Maka*



Technology and News

- 33 Innovative High-Performance Concrete Floor Sealants Prove Successful, *by Clint Wilson and Susan Drozd*
- 34 Bulletin Offers Guidance for Managing Unpaved Roads on Installations, *by Muhammad Sharif and Harold Balbach*
- 35 Bulletin Offers Guidance for Managing Non-Native Invasive Species, *by Harold Balbach*
- 37 Low Impact Development: Bulletin Offers Best Practices, *by Muhammad Sharif and Harold Balbach*
- 38 IMCOM's DPW Analysis & Reporting Tool (DART) - Pilot Site Report, *by John Alexander and Jerry E. Clark*
- 39 Tips for Using Erosion Control Blankets, *by Niels Svendsen*
- 40 Monitoring Suspended Sediments: Bulletin Provides Background on Technologies, *by Muhammad Sharif and Harold Balbach*



Professional Development

- 41 New Career Program-18 Training Requirements: Army Career Tracker and GoArmyEd, *by CP-18 Proponency Team*





How Fort Hood DPW is supporting the Ready and Resilient Campaign

by Brian L. Dosa

The Army has embarked on a Ready and Resilient Campaign to improve performance and meet the rigors and challenges of a demanding profession. Conditioning and physical training to become stronger and optimize performance are key facets of this effort and Fort Hood is using Sustainment, Restoration and Modernization (SRM) funding to support this important program. Over the past several years Fort Hood has systematically invested SRM to modernize and to improve the facility readiness of the installation's nine fitness centers, to better support the training regime of today's Soldiers.

Of the nine gyms on the installation, Fort Hood has renovated and modernized all but two to date, with one currently in progress. The renovations have been focused on providing functional spaces for Soldiers to further training and physical

fitness goals. Renovations typically include an overhaul of the outdated and inefficient mechanical, electrical, and plumbing systems serving the facilities, as well as incorporating finish upgrades, and installing climate control. Envelope and utility improvements contribute not only to the environmental quality of the building, but also provide a more energy efficient facility. Additionally, DPW incorporates other strategic choices into each renovation which provide the best level of service to Soldiers and others utilizing the fitness centers.

For example, Fort Hood has embraced the concept of functional fitness as an excellent means of training Soldiers to be able to meet the physical demands of combat. DPW is configuring facilities so the focus can be placed on rehabilitating and strengthening the body to perform real-life activities in real-life positions. In

Acronyms and Abbreviations	
ADA	Americans with Disabilities Act
A/E	Architect / Engineer
DPW	Directorate of Public Works
MICC	Mission Installation Contracting Command
SRM	Sustainment, Restoration, and Modernization
TRX	Total Resistance eXercise
UV	Ultraviolet

the design for the planned renovation of Iron Horse Fitness Center, Fort Hood is taking this concept to the next level by providing facility space dedicated to integrating body parts to work independently using equipment. Proper space planning allows for conventional fitness areas such as weight-lifting and other machine-focused training, but also provides stations with the flexibility needed for whole-body movements



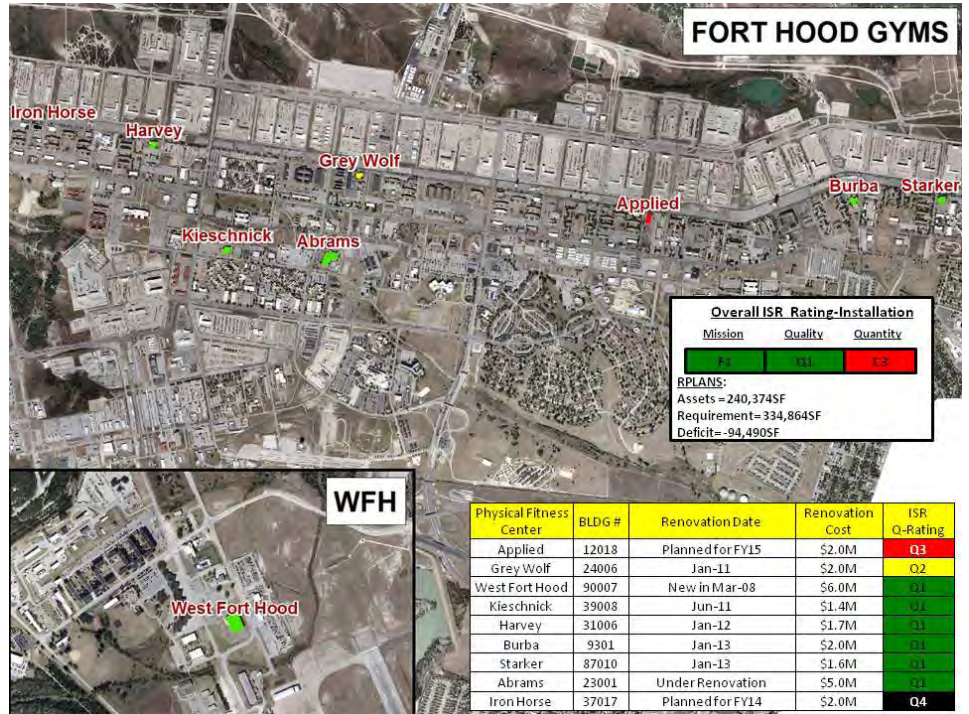
Ongoing renovations in Abrams Gym will providemodernized and efficient infrastructure for Soldiers and their Families. (CPL B. Sigola)



(continued from previous page)

like squats, balancing exercises, dumbbells, stability balls, and “wobble boards”. Fort Hood has invested funding in TRX Suspension Trainers (which leverage gravity and bodyweight to strengthen the core and develop balance and flexibility) tactical sandbags, and agility hurdles to provide for more real-life training and workout scenarios within the fitness center. Allowing space for these stations provides a unique gym experience for the user, and allows for more rehabilitation and resiliency-centered workouts. Other improvements include additional power drops throughout the facility to provide flexibility for moving equipment and further space reutilization as required.

Fort Hood has also made the choice in several gym renovations, including the Abrams Fitness Center, to provide a family-style restroom area with changing and shower facilities. Such an area provides incomparable benefit for



Fort Hood’s nine fitness centers are located strategically throughout the Installation to provide maximum availability to Soldiers, Families, and civilians. Fort Hood leaders are actively working to reduce the deficit in gym space to best support the Ready and Resilient campaign. (A. Erwin)



Functional Fitness centers like the one in Starker Gym help stabilize the core and develop balance, flexibility, and strength. (L. Robinson)

Wounded Warriors who often depend on opposite-sex caregivers when dressing or showering before or after fitness activities. Now Soldiers and their families can take advantage of a space that is specifically tailored to their needs. ADA-compliant restrooms are also incorporated into renovation designs. The Abrams Fitness Center renovation design also included bonus features such as administrative space and a juice bar; as well as a complete refinishing of the pool area, new diving boards, an Ultraviolet (UV) cleaning system to reduce chlorine usage, and climate control in the natatorium. Additionally, the fitness center renovation was designed with a view towards maintaining flexibility so that tournaments, deployment/redeployment ceremonies, or special events could be held there. This strategic space planning will allow Fort Hood to use the space for alternate purposes if necessary in the future, while

also allowing for a move towards a more functional fitness atmosphere if desired.

Combined with Fort Hood’s focus on incorporating the right assets and improvements into fitness renovations, the Directorate of Public Works has placed great emphasis on gaining the best value for the taxpayer’s dollar. Renovations are most often designed in-house utilizing DPW staff engineers who have an intimate and detailed understanding of the needs of Fort Hood Soldiers. In this approach, Fort Hood is able to save resources for tangible facility and infrastructure improvements. A key example of Fort Hood’s commitment to being a steward of resources is the planned Iron Horse Gym renovation, which has been designed by in-house staff and will be executed through the local Mission Installation Contracting Command (MIACC) in order to use a local contractor who is familiar with Fort



(continued from previous page)

Hood’s needs and can provide best value cost-effectively. Fort Hood has also found great value in obtaining renovation designs through Architect/Engineer (A/E) firms, and then executing via the local MICC through a competitive bid process. For example, the current renovation of Abrams Gym was designed by a Texas-local A/E firm, competitively bid through the local MICC, and awarded to a local contractor. Fort Hood will add value to the locally executed projects by performing quality assurance in-house, ensuring local interests are addressed and prioritized accordingly.

Fitness and rehabilitation are primary concerns at Fort Hood, so much so that nine fitness centers are merely the tip of the iceberg when it comes to what

is available for Soldiers for wellness. Through the efforts of the DPW, units, and other local entities – Fort Hood offers nine confidence courses in localized unit areas, an air assault tower, an archery range and obstacle course, and two running tracks with obstacles on either side of post. Additionally, because Fort Hood has a significant deficit in gym space compared to our requirements, the installation has developed plans to provide additional gym space on the east side of the installation by repurposing the Warrior Way Post Exchange into a fitness center once the construction of the new Clear Creek Post Exchange is complete.

From a facilities management perspective, Fort Hood has made great strides in renovating and improving fitness

facilities which, in some cases, had not had a serious makeover since original construction in the 1970s. With an aim towards providing sustainable spaces upon which Fort Hood Soldiers and families can depend on for years to come, Fort Hood will include all gyms in the Engineering Management System “BUILDER.” As part of the BUILDER process, facilities are inventoried and inspected by a third-party and log a complete detail of each facility into the database. Fort Hood supplements this inventory and inspection data with the knowledge of each facility’s deficiencies and component information. The culmination of the initial input is a preventive maintenance schedule and list of projected deficiencies which allows engineers and craftsmen to plan SRM activities based on complex engineering data. As improvements or changes are made to each facility, DPW will update the information in BUILDER in order to generate updated plans and ensure sound decision-making based on changing conditions.

The Ready and Resilient campaign is critical to strengthening resilience and improving the readiness of today’s Soldiers. The Fort Hood DPW is contributing to the campaign by ensuring that the well-being of the Force is given the priority it deserves. Modern, efficient, and operable fitness facilities (both indoors and out); improvements that foster a rehabilitation-focused environment; and execution plans that gain best value for the dollar are all ways in which Fort Hood DPW hopes to provide the infrastructure needed to best serve those who serve.

POC is Brian L. Dosa, 254-287-5500, Brian.l.dosa.civ@mail.mil

Brian L. Dosa, ,P.E., is the director of Public Works at Fort Hood, Texas. Jill Alexander is a program analyst in the Business Operations and Integration Division, Directorate of Public Works at Fort Hood, Texas. 🍷



Soldiers use the TRX suspension equipment in Starker Gym. (L. Robinson)



Communication and Commitment Keep Fort Hood Projects Running Smoothly

by Colonel Charles H. Klinge and Randy Cephus

Providing quality project management, where projects are completed on time, within scope and budget, is a challenge, but it is vital to maintaining positive relationships with the customer. The Fort Worth District's Central Texas Area Office and its customer, the Directorate of Public Works attribute communication and commitment as the foundation for meeting the needs of the Fort Hood community.

"In order to remain a viable organization, we must strengthen and maintain customer relations by addressing their issues and delivering on our commitments," said the Corps of Engineers, Fort Worth District commander, Col. Charles H. Klinge, Jr. The face of the CTAO team is area engineer Sam Parker. Parker works hand-in-hand with Fort Hood's director of public works, Brian Dosa, during the execution of the many on-going projects at



Col. Charles H. Klinge

the location touted as the largest military installation in the free world.

The two have worked together since 2010 on projects ranging from barracks,

Acronyms and Abbreviations	
CTAO	Central Texas Area office
DPW	Directorate of Public Works
HEPA	Health Facilities Planning Agency
MILCON	Military Construction
QA	Quality Assurance

unit administrative buildings, training ranges and dining facilities, medical and dental clinics, child development centers, and chapels. Among the more notable projects the Fort Hood teams collaborated on include the new Carl R. Darnall Medical Center, the replacement for the old Prichard Stadium and the renovation of Abrams Gym.

"One of the keys to success is the communication and exchange of information between the two agencies," said Parker. "We conduct regularly scheduled project updates, conduct project site visits and work through our challenges as a team." According to Dosa, there are two basic types of projects that are executed through the Corps: military construction and sustainment, restoration, and modernization. "The Corps has project oversight for the Army when it comes to MILCON projects, but DPW is with them every step of the way because in the end, we will be the owners of the facilities and will have to maintain them," he said.

The SRM program, on the other hand, is managed by the installation. SRM projects are often lower in cost and smaller in scope but are just as important to the customer as the larger, more notable projects. "With maintenance and renovation projects such as aircraft hangar repairs and barracks renovations, the DPW makes the decision on how we will execute those projects," said Dosa. "In some cases we will manage and QA the project using our local contracting



Fort Worth District chief of Engineering and Construction, Brian Giacomozzi and Fort Hood's director of Public Works, Brian Dosa look on as Erica Trovinfal, the Health Facilities Planning Agency project coordinator, briefs USACE Commander, Lt. Gen. Thomas Bostick, during an April tour of the hospital replacement project site in Fort Hood, Texas.



(continued from previous page)

office and in-house staff, while in others we will execute the contract using Corps contracting and QA personnel.”

In September of 2010, the Fort Worth District awarded a \$534 million design-build contract for the construction of a 947,000 square foot medical center, which includes a six-story hospital tower, three out-patient clinics and three parking garages. “The medical center project, managed separately from the CTAO office, is approximately 80 percent complete and is expected to be open for patients in the summer of 2015,” said Richard Alexander, the Fort Worth District construction manager and area engineer. “We are a dedicated team with our sole focus on the Medical Center.”

“The Health Facilities Planning Agency is another team member that is vital to



Lt. Gen. Thomas Bostick is briefed on the hospital replacement project in Fort Hood.

the success of the hospital replacement project,” Dosa said. “The HFPA team is here to help ensure the facilities are built to suit the specific needs of hospital staff and their patients.” But before any of this could happen, there had to be room for the new medical facility. It was decided to demolish one of the installation’s most visible icons, Prichard Stadium, a Fort Hood landmark since the 1950s.

With a pledge to the Killeen Independent School District to complete the new stadium in time for the upcoming football season, the Corps and its DPW counterparts had to work swiftly and efficiently to deliver on this commitment. “Building a medical center is a once in a lifetime project,” said Dosa. “We wanted to put it in the best possible location and that just happened to be the location of the football stadium. This was a win-win situation because we got the best location for the medical center and a new \$14 million stadium delivered in time for the upcoming season.”

The “Great Place,” as Fort Hood is called, has many modern buildings, exceptional training facilities and world-class medical care. This is in large part due to the partnership between the Corps of Engineers and the DPW where commitments are honored and communication is free flowing. “We have a great working relationship with the District headquarters in Fort Worth, as well as the area office here on Fort Hood,” said Dosa.

Despite occasional differences on the path to take, the Corps and the DPW are always in agreement when it comes to their destination -- providing world-class facilities for the soldiers, family members and retirees of Central Texas.

POC is Randy Cephus, 817-886-1310, randy.r.cephus@usace.army.mil

Colonel Charles H. Klinge is the commander of the Fort Worth District, U.S. Army Corps of Engineers. Randy Cephus is a Public Affairs specialist with the Fort Worth District, U.S. Army Corps of Engineers.

Call for **ARTICLES**

The
October/November/December 2014
issue of the
Public Works Digest
will feature

Energy, Water and Waste

Deadline is August 30, 2014

Submit articles to
editor.pwdigest@usace.army.mil
202-761-0022



Leveraging Partnerships Helps Cope with Diminishing Resources - 249th Engineer Battalion aids USAG-Hawaii's DPW

by Sally Ciereszko

With an aging electrical infrastructure, both inside the Wheeler Army Airfield installation and the Hawaiian Electric Company, the DPW struggles with mitigating for multiple, unplanned power outages that exceed 20 in any given year. Compounding the situation for DPW, lags in hiring have crippled our high voltage electric and generator capability. The DPW is forced to engage in creative ways to meet our mission to provide sustainable facilities and services to support and improve the quality of Hawaii's military community and enhance warfighter readiness and well-being.

With military units dealing with reduced budgets and fewer deployments, there

is an opportunity to provide hands-on training opportunities to military units. The solution is obvious, to combine the Garrison's failing infrastructure and highly skilled, licensed, but thin workforce, with the U.S. Army's power production experts of the 249th Engineer Battalion (Prime Power).

The partnership with A Company, 249th Eng. Bn., based out of Schofield Barracks, has been mutually beneficial, and the opportunities in front of us are unmistakably promising. DPW takes the time to ensure the proper equipment, training and knowledge to work side by side in an apprentice-like role with eager Army engineers. Although A/249th has been an integral part of supporting the DPW on some level for more than 20 years, in recent years, the DPW views this relationship as even more essential to providing improved service to our customers.

The A/249th crews are very capable and willing to learn and assist in any manner, which is extremely appreciated by DPW and our high voltage shops. The unit's support with our generator mission is invaluable because we currently have no one in a shop that is normally staffed by two employees. A/249th has provided tremendous generator asset management assistance by checking all generators assigned to DPW and then entering all data information into a logbook.

Because some of the A/249th Soldiers reside on base, they sometimes are our first indication of an unscheduled outage as they give the high voltage supervisor a heads up, allowing for a faster response. Because of the staffing shortages and lengthy recruitment process, having the A/249th Soldiers available to augment our high voltage staff allows us to catch up with some of our workload. Because of their knowledge and capability, we have the option of letting them handle some work

Acronyms and Abbreviations

A/249th	A Company, 249th Engineer Battalion (Prime Power), U.S. Army Corps of Engineers
DPW	Directorate of Public Works
Eng. Bn	Engineer Battalion

on their own while our crews focus on other critical issues.

The specifics of the projects they have been engaged in are too numerous to count, but cover every area of our high voltage workload and extend from maintenance and calibration of equipment to comprehensive emergency response. Although not specifically counted, A/249th's contributions to the DPW are on the order of hundreds of thousands of dollars.

Through working with the DPW, the A/249th Soldiers gain valuable, real-world experience necessary for its support to the National Response Framework where they provide temporary emergency power support. They train with us at our Schofield Barracks Water Treatment Plant, connecting their organic generators and running the plant for days at a time.

In addition, DPW has a high voltage training area located in the gulch, here, which allows A/249th to train with DPW. This training area contains manholes, poles, overhead lines and direct buried cable. This allows the DPW shop personnel and A/249th Soldiers to train on climbing poles, planting poles, cross-arms, operating and using bucket trucks, manhole and overhead line rescue, and toning for direct buried cables, etc.

It is the intent of both the DPW and A/249th to expand these interactions as they make sense to both missions, to include possibly involving A/249th in the support of a complete substation replacement, and working with programs to train and use both high voltage and interior electricians. ➤



Company A, 249th Engineer Battalion (Prime Power), U.S. Army Corps of Engineers, completes joint training with the Directorate of Public Works, U.S. Army Garrison, Hawaii. (249th)



USACE, DODDS Take Aim at Aging Schools in Europe

by Vince Little

Department of Defense Dependents Schools-Europe and U.S. Army Corps of Engineers Europe District are engaged in a robust military construction program designed to revitalize dilapidated schoolhouses, some of which were built in the post-World War II era. It is part of a multibillion-dollar effort by the Department of Defense Education Activity to replace or renovate more than 130 schools worldwide based on age or failing conditions. The vision is to align 21st-century instruction and learning concepts with state-of-the-art facilities that maximize energy and sustainability features while giving military children the best possible opportunities during their intellectual growth, officials say.

Units, agencies and organizations throughout the DOD face rapidly changing strategic and fiscal realities. However, the need for new schools at a time of budget uncertainty boils down to upkeep, said Jose Tovar, the DODDS-Europe facilities manager. "Maintenance requires a lot of investment – many of our assets date to the 1940s and '50s. The infrastructure has deteriorated, and costs

are high," he said. "Broken walls, chipped paint, aging classrooms, and old heating and cooling systems are not conducive to good learning environments. It's more cost effective to replace it than fix it."

In 2008, DODEA submitted a report to Congress on the condition of its facilities worldwide. Tovar said DODEA now conducts those assessments every three years, and they serve as the basis for what's being done to refurbish old schools or build new ones. The DODEA military construction initiative began in October 2010 and is expected to run through fiscal year 2019. Europe's portion includes more than 40 projects worth \$1.8 billion in Germany, Belgium, the United Kingdom and Turkey, according to Lisa Bobotas, the DODDS program manager for USACE Europe District.

In November, ground was broken on a new elementary and high school complex at Panzer Local Training Area near Stuttgart, as well as a project that will expand the middle and high schools in Ansbach. Work is scheduled to begin this spring on an addition to Netzaberg Middle School in Grafenwoehr. The centerpiece event in 2014 will be the unveiling of three DODDS-Europe schools on the NATO base at Supreme Headquarters Allied Powers Europe in Belgium. The American elementary and middle schools are expected to open by the start of next school year, while the high school should be finished by sometime the following winter.

"The SHAPE schools have traditional designs," Tovar said, "but every bit of those buildings will be used for learning. We don't have any wasted space." All future DODDS-Europe projects are subject to shifting priorities, so funding levels could fluctuate, he added. The Office of the Secretary of Defense is set to release its European Infrastructure Consolidation study in March.

Bob Purtiman, a DODDS-Europe

Acronyms and Abbreviations

DOD	Department of Defense
DODDS	Department of Defense Dependents Schools
DODEA	Department of Defense Education Activity
EIC	European Infrastructure Consolidation
NATO	North Atlantic Treaty Organization
STEM	Science, Technology, Engineering and Math
USACE	U.S. Army Corps of Engineers

spokesman, said the U.S. student population sat at about 40,000 in 2008. Today, that figure is down to 30,000. "The EIC will give us some clarity," Tovar said. "It looks at where our assets can be consolidated. We'll know where the troops are going to be, and in turn, where our students need to be.

"We're in a tight budget environment. Our focus will remain on enduring locations that have been identified in Europe." Other projects already funded in fiscal 2014 include Hainerberg Elementary, Wiesbaden Middle School, Kaiserslautern Elementary and Ramstein High School in Germany, along with Lakenheath High School in England. "These communities will be getting some quality schools for minimal investment," Bobotas said. "These buildings are ideally suited for a life span of 50 years. They're also conducive to the presidentially mandated STEM [science, technology, engineering and math] program. ... [But] doing this right and economically are the most important things."

DODEA's construction and renovation program will ultimately result in the replacement or overhaul of more than 70 percent of its 194 schools. Major projects normally require five years to complete as the steps encompass proposal, approval, funding, planning, design and construction. Tovar said the organization also is moving toward a "21st Century Teaching

(continued from previous page)

In addition, DPW is engaging with and is seeking out other partnerships with other Army engineer units in Hawaii to provide training opportunities while improving the military community. These efforts involve both support for maintenance and horizontal construction initiatives, so long as a quantifiable mutual benefit can be obtained.

POC is Sally Cierieszko, 202- 412-1551, sally.g.cierieszko.civ@mail.mil.

Sally Cierieszko is the deputy director, Directorate of Public Works, U.S. Army Garrison, Hawaii.



(continued from previous page)

and Learning” model that is more than just facility design. Current schools don’t inhibit this transition from happening, but new facilities will significantly simplify and ease the change in focus from teacher-centered to student-centered education.

With the exception of SHAPE and the two Stuttgart facilities, all the replacement projects in Europe are being engineered around the “21st-century” concepts, he added. Planners will maximize resources and look toward the future of teaching and learning to determine how the buildings can accommodate the technology, refined curriculum and innovation that will occur in classrooms.

DODDS-Europe and USACE officials say the new schools incorporate many energy-saving and sustainability features aimed at increasing durability and reducing taxpayer expense. Among them is the use of natural lighting, solar panels, “green” roofs, rainwater harvesting, low-flow faucets and fixtures, and sophisticated heating, ventilation and air-conditioning systems.

“Our repair costs will go down,” Tovar said. “In the long run, the energy savings should be significant.”

POCs are Lisa Bobotas, 011-49-611-9744-2103, lisa.a.bobotas@usace.army.mil; and, Jose Tovar, jose.tovar@eu.dodea.edu .

Vince Little is a Public Affairs specialist with the U.S. Army Corps of Engineers Europe District.



From the editor

Please note we are reducing the number of printed copies of the Public Works Digest. If the number you receive does not meet your need, please contact me at editor.pwdigest@usace.army.mil Thank you.

Kathye Gerrity-Milibram
Managing Editor



In a joint venture with Mitchell-Giurgola of New York and ABATEC of Belgium, U.S. Army Corps of Engineers Europe District is managing construction of a \$180 million project at SHAPE International School in Mons, Belgium. The new campus will include new DODDS-Europe elementary, middle and high schools, and an international school. (Mitchell-Giurgola/ABATEC Joint Venture)



Army Corrections Facility in Europe Set for Move to Sembach

by Vince Little

U.S. Army Corps of Engineers Europe District is playing a key role in transferring the last Cold War vestige in Mannheim to the revamped Army garrison. Officials have targeted late July 2014 for completion of U.S. Army Regional Correctional Facility-Europe, which is among numerous functions being shifted to Sembach Kaserne as part of the Coleman Barracks closure. The new \$9 million replacement complex likely won't be fully outfitted until sometime this fall to allow time for the relocation of personnel, prisoners and other assets. Right now, the jail is the only active element left at U.S. Army Garrison Mannheim.

Europe District's Kaiserslautern Resident Office is managing the project, alongside its contractor, LBB Kaiserslautern. Construction began last April. "The confinement facility in its Mannheim location is the last facility still operational at Coleman Barracks," said project manager Kristen Stroh. "It is Europe District's responsibility to ensure timely construction contract completion and swift turnover so that the installation can close and be turned back over to the German government." The corrections facility opened at Coleman Barracks in 1963, but its history dates to the end of World War

II. Beginning in 1945, the U.S. ran the confinement mission out of Mannheim Castle. It remains the Army's lone military prison in Europe.

Sgt. Maj. Jeffrey Plemmons, the U.S. Army Regional Correctional Facility-Europe sergeant major, said its main purpose in Germany is to secure pretrial and short-term prisoners normally serving less than a year. The unit also provides Soldiers downrange to advise and conduct detention operations. But being assigned to a "work-only" site in Mannheim presents challenges, he added. For example, Army and Air Force Exchange Service restaurants or establishments run by the Directorate of Family and Morale, Welfare and Recreation are not available. "All the Soldiers, sailors and airmen who work here live in the Kaiserslautern area, so they commute about 60 miles a day round trip," Plemmons said. "Emergency and [Directorate of Public Works] support are still available to us, so in the time since Coleman closed, we haven't had any significant problems."

When finished, the new facility at Sembach will house up to 40 individuals for pretrial and post-trial confinement, as well as sentence duration, with separate quarters for men and women. The complex will consist of a security and administration office, dining facility, chapel, showers, storage, reception, visitor areas; training, supply, mail and counseling rooms; library and health clinic. Stroh said Army Corrections Command is funding the closed-circuit television security system, kitchen equipment and cell furniture, which are being handled through separate, individual contracts. Those items must be in place and operational to gain facility certification by July 21. "But it will takes us roughly 90 days to move furniture, [information technology] equipment ... and train and certify our Soldiers on the security systems there," Plemmons said.

The Sembach corrections facility also

Acronyms and Abbreviations

Sgt. Maj.	Sergeant Major
-----------	----------------

will receive power from a new cogeneration plant, Stroh said. "This facility was built in accordance with confinement-facility design guides that should ease operations in contrast to the previous confinement facility, which was a renovation of an existing building," she added.

While the maximum capacity is 40, the operational level will be closer to the monthly average of 30-32 prisoners, Plemmons said. Roughly 65 percent of the population is there for crimes such as assault, rape and sexual assault. The sergeant major said the new setup will have many advantages over the current Mannheim jail. "The electronics for the security system should be a huge improvement, and the closed-circuit TV monitoring system at the new facility is state of the art," he added. "The hope is it will provide a safe, secure place for the prisoners to live and work and for the staff to work. The facility is compact, and the design allows the prisoners easy access to all staff and treatment programs."

USACE remains instrumental in the restoration and modernization of Sembach Kaserne, shifted from Air Force to Army control in 2010. Numerous Europe District projects include utility and site preparations for the corrections-facility transfer, design and renovation of a building for the American Forces Network's relocation from Mannheim, and a two-building overhaul at Sembach to accommodate a move by the U.S. Army Europe Band.

POCs are Kristen Stroh, 011-49-611-9744-2043, kristen.m.stroh@usace.army.mil; and Sgt. Maj. Jeffrey Plemmons, DSN 314-382-5421, jeffrey.n.plemmons.mil@mail.mil.

Vince Little is a Public Affairs specialist with the U.S. Army Corps of Engineers Europe District.



Work continued last November on the new U.S. Army Regional Correctional Facility-Europe at Sembach Kaserne, Germany. It's being built as a replacement for the corrections facility at Coleman Barracks in Mannheim. When completed this summer, the complex will house up to 40 individuals during pretrial and post-trial confinement, as well as sentence duration, with separate quarters for men and women.



Partnering for a Sustainable Future

by Heather Burke

When local businesses and community leaders in Mount Ida, Ark. noticed an annual decline in tourism revenues during the off-season at Lake Ouachita near Royal, Ark., they decided to seek a solution by developing alternative recreation opportunities for visitors to enjoy in the area. With today's increased emphasis on active lifestyles, hiking and biking have become two of the fastest growing recreational activities in the U.S. In 2002, Jerry Shields, President of the Mount Ida Chamber of Commerce and a charter member of the Lake Ouachita Citizens Focus Committee, a volunteer group of area citizens, proposed a concept referred to as the "Denby Bay Development Plan." The proposed plan would link six resorts, six U.S. Army Corps of Engineers recreation areas and two U.S. Forest Service campgrounds with a 44-mile long hiking/ biking trail along the southern shore of Lake Ouachita, an Army Corps of Engineers' managed lake. As a result of this effort, a partnering group totaling 15 organizations came together to provide assistance in the development and construction of the Lake Ouachita Vista

Acronyms and Abbreviations	
ADA	Americans with Disabilities Act
Ark.	Arkansas
DRBA	Dan River Basin Association
LOViT	Lake Ouachita Vista Trail
Va.	Virginia

Trail (LOViT) and its supporting facilities.

In addition to the LOViT, supporting projects have been added to include an 800-foot ADA accessible elevated walkway and fishing pier, wildlife viewing areas, paved walking pathway, foot bridges, parking lots, signs, kiosks, trail heads, pavilion, and six exercise stations. "The LOViT has grown in popularity so much that organizations from several surrounding states now schedule annual events on the trail. As a result of this partnership, thousands of trail users are bringing new recreational revenues to the Montgomery and Garland County areas." said Bill Jackson, Lake Ouachita supervisory ranger with the U.S. Army Corps of Engineers.

"In today's budgetary climate, partnering is an essential tool that allows the Army Corps of Engineers to effectively manage recreation and environmental



Philpott Marina Open House

resources. Each year, thousands of partner organizations and individuals help us maintain and enhance our nation's natural resources through activities such as wildlife protection, habitat improvements, restoration projects, recreational facility enhancements, education and outreach, and much more," said Mary Coulombe, chief of Natural Resources Management with the U.S. Army Corps of Engineers.

"In fiscal year 2013, more than 1,000 partners contributed a total value of more than \$50.7 million, which is an additional 14 percent above the recreation and environmental stewardship program budgets. Volunteer time provided by partners contributed the equivalent of 147 full-time equivalents. Those numbers further equate to a lot of work that aids natural resource staff in accomplishing their daily duties and meeting the needs of the public," added Coulombe.

Like Lake Ouachita, the most successful partnerships provide benefits to a wide group of people and organizations. In the small rural town of Bassett, Va., the economy took a nosedive when the North American Free Trade Agreement caused the furniture industry in many towns to move overseas beginning in the mid-1990s. Recognizing something had to be done to save his community, Army Corps of Engineers' Operations Project Manager at Philpott Lake in Bassett, 'Rocky' Craig Rockwell met with community leaders ➤



ADA accessible elevated walkway



Europe Transformation, Construction Oversight Key Themes at Annual Forum

by Vince Little

Prioritizing needs and planning ahead will be crucial for stakeholders and project-delivery teams in Europe and Africa to maximize efficiencies under the new fiscal reality of tighter budgets and funding, officials said at the 2014 U.S. Army Corps of Engineers Customer Workshop. The fourth annual forum brought together top USACE Europe District leaders and their key partners from military agencies around European Command and Africa Command to discuss challenges, strategies and opportunities for refining the way they do business. About 90 people attended the daylong session, which took place February 6, 2014 at the Community Activity Center on Clay Kaserne.



USACE Europe District hosts annual Customer Workshop in Wiesbaden

The group heard presentations on Europe's transformation, military construction, operations and maintenance programs, training opportunities, project oversight, installation support, value engineering, the services contract approval system, energy-savings measures and information-technology security items. Attendees engaged in open dialogue aimed at sharpening procedures, finding

solutions, and strengthening relationships in construction and project delivery. "The main objective of the workshop is to collectively discuss how we may better serve and deliver our projects and services to our customers and partners," said Deputy District Engineer Mark

Roncoli. "It's important to bring everyone together like this to facilitate improved communications by providing a forum to discuss best practices and lessons learned across our facility engineering communities."

Participating agencies included Installation Management Command-Europe, U.S. Army Europe, 5th Signal Command, AFRICOM, the Defense Logistics Agency, Department of Defense Dependents Schools-Europe, Europe Regional Medical Command, the Missile Defense Agency and Naval Facilities Engineering Command. There were also representatives from Directorate of Public Works offices across Germany, Italy and Belgium.

Europe District set up the workshop in 2011 to address shared concerns, improve coordination, and create a better understanding of the joint efforts between clients and USACE project-delivery teams. It's an opportunity to exchange experiences and ideas with project managers and district leaders. Meeting organizers tweaked the format this year, allowing senior officials from the customer side

(continued from previous page)

and together they formed a plan to market the lake as an economic generator. Over time, a small group called the Friends of Philpott Lake grew and morphed into a portion of the lake's official cooperating association with the Dan River Basin Association (DRBA). With the assistance of DRBA and other local partner organizations, new facilities have been constructed and more are planned. "It's a benefit to our local economy. The 700,000 visitors that come to Philpott Lake each year bring millions of tourism dollars to our local region," said Tiffany Haworth, Executive Director for DRBA.

"Partnering with the Corps allows our organization to accomplish so much more than we could ever do alone. The expertise, vision, and leadership that the Corps brings to the table provides a strong foundation for any project we're working on together. For us, the partnership allows us to have access to this beautiful system of parks and be able to help the rangers so that we can make sure our natural resources stay protected and preserved for future generations", said Haworth.

POC is Heather Burke, 503-808-4313, heather.d.burke@usace.army.mil

Heather Burke is the National Partnership Program Manager, for Headquarters U.S. Army Corps of Engineers.

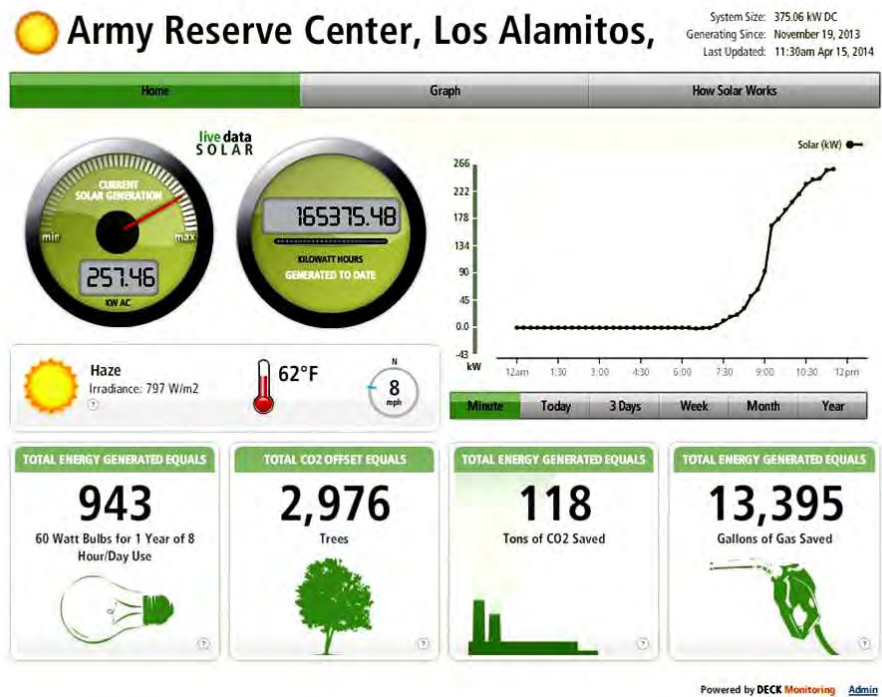


The Army Reserve Gets the Gold

by Stewart R. Fearon

The U. S. Army Reserve 63d Regional Support Command (RSC) continues its progress in creating sustainable installations. Recently the U.S. Green Building Council (USGBC) awarded the U.S. Army Reserve Center (USARC) in Los Alamitos, California a Leadership in Energy and Environmental Design (LEED®) Gold Certification. The facility was built on Joint Forces Training Base (JFTB) by Cox Construction Company and is the home of the 79th Sustainment Support Command (SSC).

This new USARC provides administration, storage and training space; a weapons simulator; and a vehicle maintenance facility for all Army Reserve soldiers assigned to units on JFTB. The 52,479 square foot USARC consists of administrative offices, classrooms, an assembly hall with a kitchen, a physical conditioning room, and support areas. It also houses a separate 10,118 square foot Organizational Maintenance Shop and ➤



Los Alamitos PV Array online

(continued from previous page)

to lead discussions on select topics. Sean McDonald, IMCOM-Europe's chief of construction, spoke about the region's transformation strategy and need to recapitalize existing facilities as the trend toward a smaller troop presence continues on the continent. USAREUR constitutes just 5 percent of "Big Army" right now, he added.

"We're looking at how we can consolidate, divest and invest in our facilities," he said. "We're getting smaller with the forces that exist in Europe. Excess facilities cost money, so we're looking to get rid of them. When you do that, you reduce operating and utility costs."

In 2006, about 54,000 Soldiers were stationed in Europe, according to McDonald. By 2016, only 30,000 are

projected to remain, along with roughly 30,000 airmen. The number of Army garrisons has dwindled from 22 to seven in the past eight years.

Colonel Garrett Cottrell, command engineer for Joint Special Operations Task Force-Trans Sahara and another first-time participant said he was interested in the district's construction-oversight measures. The Stuttgart-based task force has an active construction program in North Africa and Germany that supports various host nations as they upgrade their infrastructure to meet mission requirements. But there are significant challenges, such as distance to actual work sites and regional security issues, the colonel said. "Because of those concerns, we wanted to try to reinforce the need for more active observation of the construction process," he added.

Overall, the USACE Customer Workshop offers a good chance to swap lessons learned and future priorities, Cottrell said.

"The benefit is it allows us to have a forum to discuss our concerns," he said. "We have a better understanding of all the stakeholders involved. Wherever our concerns, I think there will be an active effort to address that. ... There are limited resources now – be it time, personnel or money – so we have to try to be more efficient and more effective in our execution. I believe that's one of the takeaways from this forum."

POC is Mark Roncoli, DSN 314-570-2702, mark.a.roncoli@usace.army.mil

Vince Little is a Public Affairs specialist with the U.S. Army Corps of Engineers Europe District.



(continued from previous page)

an Unheated Storage Building.

The facility also includes a 379 kilowatt Photo Voltaic (PV) car canopy system designed to provide a Net Zero Training Facility. Anyone with internet access can watch in real time how much energy the PV array is generating at Los Alamitos by going to: http://live.deckmonitoring.com/?id=army_reserve_center_los_alamitos_ca. Any energy not used by the USARC itself is fed back into the JFTB grid and is used by other military organizations at no charge.

The Los Alamitos USARC achieved LEED certification for energy use, lighting, water and material use and incorporates a variety of other sustainable strategies. By using less energy and water, this LEED certified building saves tax payers' money; reduces greenhouse gas emissions; and contributes to a healthier environment for residents, workers and the larger Los Alamitos community.

"The Joint Forces Training Base Army

Reserve Center Gold LEED certification demonstrates tremendous green building leadership," said Rick Fedrizzi, President, CEO & Founding Chair, U.S. Green Building Council. "The urgency of USGBC's mission has challenged the industry to move faster and reach further than ever before, and the U.S. Army Reserve serves as a prime example of just how much we can accomplish."

The USGBC's LEED green building certification system is the foremost program for the design, construction and operation of green buildings. There are four levels of LEED certification: Certified, Silver, Gold and Platinum. Projects are scored in several categories including: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process. Projects that score 26 to 32 points receive a LEED "Certified" rating; 33 to 38 points, a Silver Rating; 39 to 51 points, a Gold Rating; and 52 or more points, a Platinum Rating. The

Acronyms and Abbreviations

CEO	Chief Executive Officer
JFTB	Joint Forces Training Base
LEED	Leadership in Energy and Environmental Design
PV	Photo Voltaic
RSC	Regional Support Command
SSC	Sustainment Support Command
USGBC	U.S. Green Building Council
USARC	U.S. Army Reserve Center

Los Alamitos USARC scored 43 points to earn the LEED Gold Certification. To learn more about the LEED program or how to apply for a LEED certification for a project, visit www.usgbc.org or call the USGBC main line: 202-828-7422.

POC is Colonel Stewart R. Fearon, (650) 526-9805, stewart.r.fearon@mail.mil

Colonel Stewart R. Fearon, PMP, is the director of Public Works at Headquarters, 63d Regional Support Command in Mountain View, California.



Los Alamitos PV Array



Historic School Graduates to the 21st Century

by JoAnne Castagna

Students at the historic West Point’s Middle School can now do their athletics in a new gymnasium and not in the cafeteria. The cafeteria is where physical education has been held for over a year while an extensive renovation was being performed by the U.S. Army Corps of Engineers, New York District. But the wait was worth it! The renovation of the gym and many other features at the school were recently completed at the landmark structure that serves the children of service members at the U.S. Military Academy at West Point.

“The students are going to benefit greatly by this renovation. They will have access to learning spaces that are safe, modern, and efficient and they will have a setting in which 21st century curricular objectives may be pursued,” said David Rudy, Principal of the West Point Middle School. “This project is also a testament to the military’s commitment to provide world-class educational opportunities for the children of the men and women serving in our nation’s military.”

In 2011, USACE contractor Benard Associates of Wayne, N.J. began the renovation of the school. The project

Acronyms and Abbreviations	
LEED	Leadership in Energy & Environmental Design
N.J.	New Jersey
U.S.	United States
USACE	U.S. Army Corps of Engineers

included renovating the existing school that was built in 1934, which was designated a landmark, demolishing a wing to the school that was built in 1954 and constructing a new approximately 31,000 square foot addition.

The more modern 62,000 square foot educational facility includes a new state-of-the-art general purpose, art, science and music classrooms that have interactive smart boards and wireless Internet access. This includes a new digital arts lab and clay workroom in the art classrooms and a new acoustic band room, as well as a full digital video production studio.

In addition, the school has an improved gymnasium, cafeteria, playground, restrooms, library, parking area and handicapped access, as well as a new central air system, security system and fire protection and communication intercom



Completed West Point Middle School New Addition. (USACE, New York District)

system. The new structure meets the environmental requirements to be certified LEED Silver by the U.S. Green Buildings Council. The school qualifies because it has energy-efficient doors and windows; additional windows to make use of natural light; energy efficient hot water heating and chilled water cooling systems; upgraded insulation; water conserving toilets; and motion detector faucets.

The West Point campus is filled with historic buildings, including the 80-year-old middle school. “To maintain the historic look and feel of the campus we did a few things,” said Larry Danner, project engineer and contracting office representative, U.S. Army Corps of Engineers, New York District. “In the new renovated 1934 building we made sure that the new brick and precast bands and caps matched the existing building colors; we incorporated the original wood floors into the new main office spaces; and we used the original 1934 library shelving in the parent waiting area of the new main office.” Principal Rudy said, “Stakeholders have been very impressed at how the project modernized the facility while maintaining its historic appearance.”

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.



Information Center. (USACE, New York District)



Harvesting Rain and Sun at Fort Sill, Oklahoma

by Sara Goodeyon

At Fort Sill, Oklahoma the U.S. Army Corps of Engineers is taking positive steps to increase energy efficiency and preserve resources by harvesting rain and sunlight. The design and construction of some of the new facilities at the Army post includes innovative systems for collecting rainwater and using sunlight to improve energy efficiency. In a region with little rain and abundant sunshine it makes sense to hoard the one and exploit the other.

“The idea behind it is great,” said Brant Purdum, Tulsa District USACE mechanical engineer, E&C, Fort Sill Area Office. “You are conserving energy, conserving water, and conserving resources.” The rainwater collection system harvests water from the building’s roof to water the grass. The gutter system feeds into giant fiberglass tanks stored underground preventing evaporation, which happens to be a real threat to water supplies in this region. A first check filter flushes out things like bird waste and sticks, whatever is on the roof, to keep it from getting into the system. Each tank

Acronyms and Abbreviations	
E&C	Engineering and Construction
EMCS	Energy Monitoring and Control System
HVAC	Heating, Ventilation, and Air Conditioning
TEMF	Tactical Equipment Maintenance Facility
THAAD	Thermal High Altitude Air Defense
USACE	U.S. Army Corps of Engineers

has a pump tied into the irrigation system so that water from the underground tanks serves the sprinkler heads.

“We can capture the rain when we get it and use it when it’s needed,” said Paul Panter, mechanical technician, USACE Fort Sill Area Office. “There is actually a formula to use to calculate the amount of rain that can be harvested. For instance, in a two-inch rainfall event six thousand gallons of water runs off of a four thousand square foot roof.” Moreover, Panter said rainwater is actually better for the landscape than treated water because it is softer water.



The 30 thousand gallon rainwater collection tank at the Reception Complex. (B. Purdum)

The Energy Monitoring and Control System (EMCS) at Fort Sill monitors the collection system. EMCS is a computer software system that monitors water, gas, and electricity usage mainly through the management of the HVAC systems. Operators can track tank levels and filter alarms, watch the pump operation and verify that everything is in working order. If something does go wrong, it sends an alarm and operators can check on the problem.

The buildings with the rainwater collection systems are the Thermal High Altitude Air Defense (THAAD) project, Reception Battalion Complex, and the Tactical Equipment Maintenance Facility (TEMF). The THAAD has two 50 thousand gallon tanks, the Reception Complex has one 30 thousand gallon tank, and the TEMF has two 25 thousand gallon tanks. Eventually the system could be connected to other buildings. “The system on the TEMF is designed with this in mind,” said Purdum. “It could pull water from all four buildings around it. It could be the beginnings of a beneficial system.”

In a small way, the rainwater collection system will assist with cooling the building. It ties into the building’s cooling tower water supply so that it would start utilizing rainwater first rather than pulling from the building’s water supply. The first rainwater system should go online this summer (2014).

At the Reception complex, ➤



A look at the Reception Complex where the photovoltaic panels are in place on the roof. They are just visible on the roof above the two HVAC units. (B. Purdum)



Lock and Dam 22 Dewatered for Winter

by Allen Marshall

More than 10 million gallons of water removed. More than two million pounds of construction materials placed. More than 20 thousand hours of manpower expended. And, all of it done in treacherous conditions due to record low temperatures. These statistics represent a small snapshot of the work recently completed at Lock and Dam 22 as the lock chamber was dewatered and maintenance to the infrastructure was performed.

Lock and Dam 22, located on the Mississippi River near Saverton, Missouri, falls under the purview of Aaron Dunlop, chief of the Maintenance Section. Work at Lock and Dam 22 began in December and was completed in early March. Dunlop said the lock had not been dewatered in nearly two decades. “Historically in the Rock Island District, locks are typically dewatered as part of a major rehabilitation which is performed by a contractor,” Dunlop said. “That work was last done at Lock and Dam 22 more than 20 years ago so it was time to pursue some critical maintenance work that needed to be done.” Dunlop said the critical maintenance work included the installation of four new miter gates, bulkhead sill beams and struts, a new bubbler system, bulkhead stands, and valve cables; as well as an inspection of the chamber and the associated systems. All of this equipment, including the systems within the chamber, are typically



Aerial photo of Lock and Dam 22 (A. Dunlop)

under water thus the need to dewater the chamber.

The process of dewatering the lock chamber involved the use of four, 12-inch pumps, working simultaneously, to remove more than 18,000 gallons per minute which equated to nearly 10 million gallons removed throughout the duration of the project. When the chamber was dewatered, navigation operations through the lock had to be stopped. The scheduling of the project was done to minimize impact to the river industry during the cold-weather season.

Once the chamber was dewatered, maintenance work began, to include the installation of a new bubbler system. David Schipper, lockmaster at Lock and Dam 22, said the new bubbler system was

a very important maintenance need for his operations. Schipper said the bubbler system helps remove ice from the recesses so the gates of the lock can open and close fully. The bubbler system also helps during the non-winter months by helping to remove objects like driftwood which can be a hindrance to the gate operation. “The old bubbler system had become more or less useless,” Schipper said. “Without a bubbler system, locking can become nearly impossible.”

The timely, safe completion of the project was a success but Dunlop said there were plenty of challenges along the way. Most significant of those challenges came in the form of Mother Nature. The crews endured working in temperatures that dipped below zero for more than 12 days. For 47 days, the temperatures never climbed above freezing.

Looking to the future for the rest of the District’s infrastructure, Dunlop said there are plans to increase these kinds of regional work efforts with each successive project. The goal in doing this is to ensure the District’s valuable resources are being used as effectively and efficiently as possible.

POC is Allen Marshall, 309-794-5204, allen.a.marshall@usace.army.mil

Allen Marshall is a Public Affairs specialist with the U.S. Army Corps of Engineers, Rock Island District.

(continued from previous page)

photovoltaic panels on the roof collect sunlight and turn it into electricity. The big solar panels charge batteries in the building’s inverter room and those batteries assist with the building’s power. This helps to shave off the peak demand loads so the Army isn’t paying premium rates. “You don’t have to burn fossil fuels to use it,” said Purdum. “As the sun moves the panels track the sun; they are designed to always be in the sun and to catch light from both sides.”

Purdum said even though there is an initial high cost to install both systems, ultimately they pay for themselves. The lifecycle for the rainwater system is about 25 to 30 years, and about 15 years for the photovoltaic panels. Both systems are an example of how thinking outside the box when it comes to energy efficiency pays off in the end.

POC is Sara Goodeyon, 918-669-7342, Sara.H.Goodeyon@usace.army.mil

Sara Goodeyon is the deputy chief of Public Affairs with the USACE Tulsa District.



USAG Stuttgart Reduces Installation's CO₂ Emissions by 60 percent

by Christian Dengel

In an effort to improve energy efficiency and to save on utility costs the U.S. Army Garrison Stuttgart replaced an up to 50-year old and poorly insulated steam heating system with a modern hot water district heating system at the Panzer Kaserne Army installation in Böblingen, Germany.

Panzer Kaserne was previously heated by four aging oil-fired steam boilers in a garrison-owned heat plant. The boilers had a capacity of 4,000 MW each producing heat only with very low efficiency. Additionally, the old poorly insulated underground supply and return lines were leaking severely, wasting an estimated \$1,000 worth of steam a day and required a great amount of maintenance. Contrary to most other garrisons, fuel oil use for USAG Stuttgart has increased since FY03, primarily for use in the central heat plant at Panzer Kaserne.

The newly-completed \$9.4 million project replaced the old oil-fired heating

plant and Panzer Kaserne's entire heat distribution system and connected it to the City of Böblingen's hot water district heating system. The system is run by FTG, a joint venture by the municipal energy suppliers of the two neighboring cities Böblingen and Sindelfingen.

The system comprises three separate power plants and boilers on site for back up. Combined heat and power generation plants use waste heat from generating electricity as well as renewable energy sources to generate the district heat. Most of the heat produced for Panzer Kaserne comes from an incineration plant located right outside the installation. For fuel the incinerator, in part, burns trash coming from Panzer Kaserne and the adjacent U.S. operated Böblingen Army Family Housing.

For almost a year, Panzer Kaserne was a flurry of construction activity, as crews dug up streets and seeded areas to replace 6,000 meters of old steam pipes across the installation and upgraded 34 mechanical

Acronyms and Abbreviations	
CO ₂	Carbon dioxide
FTG	Fernwärme Transport Gesellschaft (District Heat Distribution Company)
FY	Fiscal Year
KW	Kilowatts
MW	Megawatts
U.S.	United States
USAG	United States Army Garrison

rooms with new control units, pumps, and heat exchangers. In cooperative planning efforts with host nation partners, workers were connecting the local off-post system to the installation's heat substation on-post, where contractors simultaneously replaced the garrison's old distribution system. Once the piping was replaced, the new district heat system functioned in tandem with the old oil-fired steam boiler system until all the final building connections were completed in April.

Today, Panzer Kaserne is heated solely by a modern hot water district heating system, powered by three power plants within the two city limits and distributed to various customers. USAG Stuttgart was able to add all of the Böblingen-based Panzer Kaserne installation to their existing system. Three new heat exchangers provide up to 12,000 kW of district heat to the installation. The system is expandable to 16,000 kW if needed.

With the completion of the project, the garrison is now providing a more efficient method to heating offices, barracks and facilities on the installation from secure and reliable energy sources. Instead of purchasing the oil (672,727 gallons in FY13), water and maintenance services, and hiring four personnel to produce district heat, USAG Stuttgart now receives the end product through an efficient and modern distribution system reducing losses to zero.

The district heat system fulfills the requirements of the European Union's ➤





Corps Looking for New Ways to Save Energy at Joint Base Lewis-McChord

by Tanya King

When it comes to saving money in a household budget, the average person might look to cut out extra expenses and things they don't need. Though there typically isn't any flexibility in a rent or mortgage payment, there is some in energy bills. That's exactly what two U.S. Army Corps of Engineers, Seattle District, employees have been working on since 2011. Project manager Dan Sacks and project engineer Jim Byrne have been working in partnership with the Department of Public Works at Joint Base Lewis-McChord, Washington, to find ways to reduce energy costs and the monthly payment the federal government makes to utility companies.

They've already identified 79 projects for which the contracting process to begin upgrades is underway.

Sacks and Byrne have worked with a company specializing in energy audits to identify upgrade candidates and found 112 facilities of the most energy inefficient on base. They pursued three different paths for these projects. One path was through contracting if it was too large for in-house personnel; 79 facilities qualified for this type of maintenance. Another handful would be upgraded by JBLM DPW personnel, so job orders were created for those. For the remaining facilities, the long



Insulation will be added to the ceiling

term savings were not realized; equipment might be relatively new yet not the most efficient, so waiting until the equipment or facility was older and to make repairs or replacements were most cost effective.

The upgrade measures consist primarily of heating, ventilation and air conditioning equipment upgrades, HVAC control strategies, lighting improvements such as more efficient fixtures and occupancy sensors, and installing insulation and low flow faucets. "Jim (Byrne) has been instrumental in not only coordinating activities with contractors but by working directly with utility company to obtain rebates," said Sacks. "These rebates are incentives from electric and gas companies—they give money back to the government if we install certain items ➤"

(continued from previous page)

renewable energies act and not only reduces Panzer Kaserne's CO2 emissions by 60% or approximately 4,500 metric tons. USAG Stuttgart is now saving approximately \$2.1 million annually in oil purchases alone. A Boiler Plant Operator added another \$80,000 in salary to the operating cost and a far bigger amount was needed for contractor services to run the plant 24/7. The high unit costs of water and sewer in Europe also made the water for steam replacement an expensive

system component. The new system was officially turned on 22 April 2014 during a ceremony with garrison leaders, host nation officials, construction contractors and other members of the military community.

POC is Christian Dengel, DSN 314-421-6253, commercial (01149) 711-7228-6253, christian.dengel1@us.army.mil

Christian Dengel is the energy manager for USAG Stuttgart Directorate of Public Works.



Acronyms and Abbreviations	
DPW	Department of Public Works
HVAC	Heating, Ventilation and Air Conditioning
LED	Light Emitting Diode
JBLM	Joint Base Lewis-McChord, Washington



(continued from previous page)

and make the buildings more efficient. We put the rebate money back into energy program to do more projects.”

The projected annual savings is \$336,000 in reduced utility costs at JBLM alone. “The money we are saving American taxpayer is huge,” said Sacks. “The more efficient we can be can only produce positive things—it helps the environment, lowers tax burden so they can invest money somewhere else rather than to utilities, which are must-pay bills, but we also improve heating and cooling systems to make the workspace a more comfortable climate for the Soldiers who live and work there.”

For Byrne and Sacks to be working on this program alongside JBLM’s DPW is a natural fit according to them. “I work with DPW regularly and coordinate

on new construction,” said Byrne. “I was already doing work on their energy program and on those projects, so I’m still working with the same people. The type of work was new to me but the people I was working with were familiar.” Sacks has been working in the energy conservation field since 1984 and has strategic and tactical knowledge of how the energy program has succeeded and failed within the Defense Department.

“I know the entrapment areas so I can steer us toward success,” Sacks said. “By writing tangible, performance-based contracts with a verifiable end product that can be constructed and based on recommendations, they are less likely to sit on a shelf. I have close coordination and integration with shop personnel to make sure they have buy-in on what we are trying to do. The guys that do the service calls help guide us in areas they know we

Showcase your **STORY**

Would you like to see your installation, agency, program or project featured in the Public Works Digest?

Submit a story

by sending it to:

editor.pwdigest@usace.army.mil

can make a difference and show us what we should be looking for.”

Through this partnership and research the team has found additional energy and maintenance savings on base outside the 122 energy-saving projects they are pursuing. “We’ve researched technology and though it didn’t make sense for certain projects, DPW can take our work and use it in another part of the base,” Byrne said. “One example is street lighting. We looked into doing an LED street lighting project. From lighting perspective, there is energy savings, but from a maintenance perspective, a LED street light only needs replacing every 15 years whereas standard street light has to be replaced every two to three years. They are taking our original project and implementing that with cost savings on labor. That really speaks to the relationship we’ve developed.”

“The Corps of Engineers has always been a close working partner with JBLM to execute our technical work,” said Eric Waehling, JBLM energy manager. “Without their partnership we wouldn’t be able to do this. They have the technical and contracting expertise to get this done and they’ve been excellent partners on this project.”

*POC is Tanya King, 206-764-6958,
Tanya.m.king@usace.army.mil*

Tanya King is a Public Affairs specialist with the U.S. Army Corps of Engineers, Seattle District.



Maintenance shop with damaged/missing insulation on pipes, and an uninsulated ceiling



Preventative Maintenance - Provides Facility Dependability and Energy Savings

by John Ramey

Does anyone not change the oil in their cars or have tune-ups on their home air conditioner? So why has preventative maintenance over the last decade been a tough issue when it comes to funding in Annual Work Plans? I believe every DPW knows that Preventive Maintenance extends the life of our facilities and gives us the best chance at energy conservation through a well maintained facility. In the recent past, the Public Works community has been challenged to perform preventative maintenance as the Army reduces funds for sustainment.

While the Public Works community is taking risks in sustainment and thereby reducing preventative maintenance, we are tasked with requirements to reduce energy. In everything from laws, to Presidential orders, to Army directives, the theme is to reduce energy. To this theme we are asked to submit projects, to hold seminars, and to turn up the thermostats to 78 degrees as a norm in the summer. However, when it comes to funding preventative maintenance that will allow our equipment to run at its most efficient mode we are told there is not enough money. This article is going to examine what happens when heating and cooling systems have preventative maintenance performed and energy conservation measures are applied.

In the past, Fort Gordon was in an environment of high dependence on break-down maintenance. We only performed very limited preventative maintenance requirements on certain parts of a system. We were not fully addressing the mechanical components of the facilities: air handler unit, flushing of the coils, adjusting the variable air volume boxes and reheat boxes and cleaning the ducts. It was not the most important issue on leaders' minds. They were focused on the requirements of new construction, renovation and having to divert funds from the sustainment account to meet other directed missions.

In heating and cooling our biggest problem was in the 14 instructional facilities of the Cyber Center of Excellence. The campus was built in the 1970's when overhead projectors and white boards were common in classrooms, as well as large bulky equipment. We decided to test our theory how on preventative maintenance improves facility comfort for students and saves energy.

Our path forward was to commit to a full waterside & airside heating and cooling preventative maintenance. In doing so we wanted to establish quality indicators for productive hours to be able to use in our new base operation contract. All data: schedules, tasks completions and cost had to be in our in-house Work Management System (i.e. General Fund Enterprise Business System, GFEBs) and finally and most importantly a complete component characterization - what was the component, where was the component located, size of the component, and number of the components. In this way we would be able to determine resources required and durations to accomplish the year schedule.

First we had to identify what we had and the requirement(s) for maintaining the equipment. For two years Fort Gordon worked to identify and determine what preventative maintenance requirements for heating and cooling systems in facilities greater than 3000 square feet. Our total was 16,334 tasks. After the equipment was identified, lists of tasks and parts required, the data was entered into a massive spreadsheet. We then needed to standardize the information into a usable technical exhibit for a contract (Fort Gordon is outsourced DPW). There we chose to use the standards in R S Means. The results were the tasks, time, parts, and frequency being all put down with a cost estimate. For this effort we now have entered those technical data sheets into our Performance Works statement for the base

Acronyms and Abbreviations

GFEBs	General Fund Enterprise Business System
-------	---

operations contract. This sets us up for a major improvement across the installation, but what about those instructional facilities we started off with?

While we were performing the above mentioned two year analysis across post we were simultaneously running tests in the instructional facilities to prove we were on the right path. Three years ago the Public works was getting service order calls and complaints about the instructional facilities being hot. That winter we started a program of flushing the entire water side system and making all adjustments to the airside. As we completed all the cleaning and adjustments, to include where required, replacements of components over several months, the question was how we would measure success. We ran a new trend model from our Utility Monitor Control System for comparison to before we started the work and it told us that our facilities were maintaining those instructional facilities at the standards published by the Army in AR 420-1, 74 degrees plus or minus 2 degrees. The real success came from the occupants who were no longer complaining about the heat, but rather complaining about the building being cold. Our service order count was reduced by 39% in heating and cooling from the previous year.

We continued our test with small energy savings tools and improving our control of the facility with our Utility Monitoring Control System to investigate if we could get more out of the systems. For this test we took two identical instructional facilities which were each environmentally controlled in four large quadrants. We had the beta facility, not improved beyond the cleaning and adjustments we have discussed. In the test facility we installed Utility Monitoring Control System ➤



Corps Delivers Solar-Powered Elementary School to Fort Stewart

by Tracy Robillard

Soldiers and their families recently gained a new \$20.5 million environmentally-friendly elementary school at Fort Stewart, Georgia. Built by the U.S. Army Corps of Engineers Savannah District and prime contractor Sauer, Incorporated, the new Murray Elementary School is equipped with over 450 solar panels, a wind turbine, and other sustainable design features.

“We are very excited to deliver this sustainable, state-of-the-art school to our valued military customers at Fort Stewart,” said Susan Smith, project engineer with the Corps’ Fort Stewart Resident Office.



Workers prepare the ground for paving and landscaping surrounding a playground at the new Murray Elementary School. The school includes multiple playgrounds designed for children grades K-6. (G. Jumara)

Acronyms and Abbreviations	
DOD	Department of Defense
DODEA	Department of Defense Education Activity
LEED	Leadership in Energy and Environmental Design

The Corps turned over the keys to the Department of Defense Education Activity (DODEA)—the organization that operates DOD schools across the globe. Murray Elementary School will accommodate up to 450 students (grades K-6) and 70 teachers and support staff. The 83,000-square-foot facility includes classrooms, computer labs, a gymnasium, a multipurpose “cafetorium” with a stage and a kitchen, a library, and administrative offices. The school is named after Charles P. Murray, a retired Army colonel and a World War II Medal of Honor recipient.

The project was designed by architect-engineer firm to satisfy Silver-level criteria on the Leadership in Energy and Environmental Design (LEED) rating system. Steve Poulin, Sauer quality control manager, said the project will supply a portion of its own energy usage. The school is equipped with 456 solar photovoltaic panels, which will provide an estimated 153.2 megawatt hours of energy per year to augment the energy used for the building’s electrical consumption, Poulin said.



The new Murray Elementary School includes 456 solar photovoltaic panels and 10 solar water heating panels on the roof. These panels will augment the facility’s total electrical usage and heat about 40 percent of the building’s hot water. (G. Jumara)

It also includes 10 solar water heating panels, providing an estimated 24.9 megawatt hours per year—which is enough energy to heat about 40 percent of the building’s hot water, Poulin said.

The school also includes a wind turbine, which will provide up to 1.5 kilowatts of grid-connected power, but production will vary based on wind conditions. “The windmill feature is primarily an educational resource for students to learn about alternative energy sources,” Poulin said.

Other sustainable features include enhanced acoustics per LEED for Schools 2007 requirements, and the use of low-impact development materials on the site, Smith said. Low impact materials include dry detention ponds, which capture storm water runoff and filter out pollutants. The site also contains pervious concrete and paving materials, which allow water to pass directly through, thus reducing runoff from the site and allowing groundwater to recharge.

POC is Tracy Robillard, 912-652-5450, Tracy.K.Robillard@usace.army.mil

Tracy Robillard is a Public Affairs specialist with the U.S. Army Corps of Engineers, Savannah District.

(continued from previous page)

devices for the heating and cooling systems and lights in every room. The result is we are now saving \$3100 per month in cost when comparing the test building to the beta building.

The preventative maintenance has proven that breakdown or unscheduled calls are reduced which ensures greater comfort at a lower cost. With the addition of Utility Monitoring Control System devices and energy monitoring devices the cost is reduced and even more important; our students have a quality

environment to train in. Simply put, our buildings are more dependable, efficient and operate at a lower cost compared to several years ago.

We must invest in preventative maintenance to save money. To save in energy we need not only to invest in preventative maintenance but also in Utility Monitoring Control systems and energy conservation devices.

POC is John L. Ramey, 706 791-3225. John.l.ramey2.civ@mail.mil

John L. Ramey, CFM, is the director of Public Works at Fort Gordon, Georgia.



Huntsville Center Offers Fast Track, Efficient Facilities Repair, Renewal Services

by Dominic Ragucci

Installations looking for help to repair or renovate buildings need look no farther than the U.S. Army Corps of Engineers, Engineering and Support Center in Huntsville, Alabama. The Center's Facilities Repair and Renewal (FRR) Program offers a fast track, efficient method for design and execution of all types of facility repairs, renovations and minor construction; and, is available to all districts and their customers as part of the Corps' one-door-to-the Corps policy.

The key to the program's success is innovative use of Indefinite Delivery/Indefinite Quantity service/construction contracts covering all 50 states plus U.S. territories.

One example of the type of work the FRR Program performs is a two-year general maintenance and repair and preventive maintenance contract at Fort McNair in Washington, D.C. In September 2012, the Huntsville Center

awarded a \$3.6 million contract to Phelps & Phelps, a Minority Owned Small Business (8a), to provide general maintenance and repair services and preventive maintenance services for the National Defense University (NDU) building 64, Lincoln Hall. Lincoln Hall is approximately 250,000 square feet of administrative, educational, and conference facility that was completed in 2008.

The project is nearly 80 percent complete. Completion is expected by September 2014. To improve the general appearance and function of the facility, the contractor is repairing all elements associated with and attached to the construction on the interior and exterior of the building, assisting in coordinating existing warranty responses to the NDU facilities engineer; and general maintenance and repair of all interior component(s). Replacement of more than 3,139 fluorescent lamps; inspection and cleaning of approximately 100,000

Acronyms and Abbreviations	
FRR	Facilities Repair and Renewal
NDU	National Defense University
WO	Work Order

square feet of roof and 34 roof drains; inspecting the lightning protection system; repairing approximately 85 lavatories and 30 urinals; maintaining the loading dock equipment; and repairing and maintaining approximately 239 variable air volume units.

Preventive maintenance is being performed on mechanical and plumbing systems per the manufacturer's recommendations; electrical systems including all cabling and only hardware rated at 480 volts and below; and other components to include loading dock equipment, approximately 100,000 square feet of roof and the lightning protection system.

Huntsville Center and the NDU facilities engineer are working together to establish quality standards based on customer complaints; to ensure that funding for work orders (WOs) has been established and maintained through annual audits; and to set certain thresholds for approval of WO's.

Together, the team performs the technical analysis to determine the feasibility of the contractor proposed work and a cost analysis to determine if funds are available to cover the WO and ensure that the government is getting a fair and reasonable price for the work. Once that is determined, the contractor gets to work.

POC is Dominic Ragucci, 256-895-1352, Dominic.D.Ragucci@usace.army.mil.

Dominic Ragucci is a project manager in the Facilities Repair and Renewal Program at the U.S. Army Engineering and Support Center, Huntsville.



Under the contract, the lighting of the exterior of Building 64, Lincoln Hall, Fort McNair, Washington, D.C., as well as the exterior of the building, front doors, windows, metal and wood trim, and signage were kept in good condition by making necessary repairs and correcting problems. (NDU)



Huntsville Center's Operation and Maintenance Engineering Enhancement Program: A Tool for Meeting Defense Department Medical Facility Maintenance Needs

by Mike Hunter and Crystal Bennett Echols

Scenario: The chiller goes down in building B3425, a military medical facility. This causes great concern as the temperature in one part of the building must remain constant to properly house the blood supply for the Acute Operating Room. If the temperature rises above 70 degrees, it interferes with the refrigeration system and the existing blood supply will be lost, impeding the mission. At 4:12 p.m., the medical facility personnel send in a request to the Operation and Maintenance Engineering Enhancement (OMEE) team for this urgent maintenance request. The OMEE team springs into action to process the request and provides a Notice to Proceed to the site by 4:30 p.m. on the same day. Necessary repairs were made and no blood was lost. As evidenced

by this real life situation, saving the day and avoiding catastrophe is a routine occurrence for the OMEE Program.

Inadequate maintenance of medical facility systems and real property installed equipment can have dire consequences that jeopardize the welfare of patients often already weakened and more susceptible to infection or other medical complications. The OMEE Program, administered by the U.S. Army Corps of Engineers, Engineering and Support Center, Huntsville, provides a simplified process to respond to the growing operation and maintenance (O&M) needs of Department of Defense (DOD) medical facilities.

The OMEE Program applies a systematic approach to the operation and

Acronyms and Abbreviations	
AAAHC	Accreditation Association for Ambulatory Health Care
DOD	Department of Defense
IDIQ	Indefinite Delivery/Indefinite Quantity
OMEE	Operation and Maintenance Engineering Enhancement
O&M	Operation and maintenance
TJC	The Joint Commission

maintenance of medical facilities to make sure these facilities serve their intended function efficiently and safely, and to ensure medical facility components reach or exceed their life expectancy. Other benefits derived from OMEE services are improved patient comfort and care, better working environment for the health care providers, easier compliance with codes and standards, reduced life safety violations, increased reliability of systems and equipment, and better long-range planning. OMEE has two suites of Indefinite Delivery/Indefinite Quantity (IDIQ) service contracts that use low-cost, quick-response task orders to execute maintenance requirements for DOD installations worldwide. These contracts can provide scheduled maintenance, corrective maintenance, pest management, aseptic management, grounds maintenance, biomedical equipment maintenance and repair or replacement services in support of medical facilities. Medical facility systems maintained include all mechanical, electrical, architectural, utility, and site systems, equipment and components.

Two of the major keys to success for the OMEE Program are: 1) The ability to address urgent and emergency maintenance issues in a timely manner, via the use of service orders. OMEE has a 24-hour hotline that is available to customers to handle these issues and have a commitment to turn around urgent requests within 24 hours. 2) Using



This is an example of pumps found in a mechanical room in a hospital. The Operations and Maintenance Engineering Enhancement Program maintains the facility and performs preventative maintenance and repairs to these type systems. (USACE)



(continued from previous page)

contractors that were selected for their ability to perform in medical facilities and are knowledgeable in The Joint Commission (TJC) and Accreditation Association for Ambulatory Health Care (AAAHC) requirements along with other medical codes and standards. Relevant medical facility accreditation bodies, such as TJC, evaluate DOD healthcare facilities at least once every three years. Failure of any DOD medical facility to qualify under any or all of these standards may result in short- or long-term loss of DOD capacity to medically serve its patient population.

DOD medical facilities that the OMEE Program serves include: hospitals, clinics,

pharmacies, veterinary facilities, dental treatment facilities, medical training and research facilities, utility and energy plants supporting medical facilities, labs, and medical storage facilities. The OMEE Program provides for medical O&M services over a facility footprint of 24 million square feet at nearly 60 DOD installations, ensuring the sustainment of safe, reliable facilities to support the growing medical needs of our war fighters, their families and retirees.

OMEE services are performance based (instead of the detailed descriptive statement of work) which results in the government and contractor working as a team to provide enhanced efficiency, cost savings, clear work requirements, superior

performance and improved customer satisfaction. Task order awards are not solely based on low bids, but are the result of various selection and award factors. Since these IDIQ contracts have numerous qualified contractors available to provide these services for a five-year period, the selected contractor has a vested interest to provide superior services that will ensure repeat task orders in the following years.

“Flexibility” underlies every aspect of the OMEE Program’s innovative methodology in contracting to provide operation and maintenance services. Whether it is one-stop shopping, improved responsiveness, increased partnering, or the contract’s yearly “option to renew,” the enhanced customer service is an integral part



Other Operations and Maintenance Engineering Enhancement examples include boilers like those installed at Womack Army Medical Center at Fort Bragg, North Carolina. (R. Hilton)



Project Maintenance - Cavitation Repairs

by Eileen Williamson

Crews at Gavins Point Dam Power Plant near Yankton, South Dakota, recently dewatered generator unit three to inspect the draft tube for damage caused by cavitation and make necessary repairs. Cavitation describes the state-change from liquid-to-gas that occurs when water flows quickly through a confined space. As water moves, vapor pressure drops changing water directly to gas. (Like water boiling with no temperature change)

Cavitation is always occurring as water pushes through the unit. When implosions, which occur during the liquid-to-gas state-change, take place near turbine structures, flow-surfaces can be damaged. Over time, resulting pits or cavities multiply requiring repairs around guide vanes, wicket gates, turbine blades and in the draft tube. Left unrepaired, damages reduce power generation efficiency, potentially lead to further damage, and ultimately cause major damage to the entire turbine.

Steve Neumann, Gavins Point's Senior Mechanic said, "We try to perform cavitation repairs every year on at least one unit. We un-water the units, one at a time and inspect the draft tube and scroll case including taking blade clearance readings, inspecting the wicket gates, taking wicket gate clearance readings, and evaluating the

overall condition of the scroll case."

The repair process doesn't always involve the detailed work taking place this year. "If a unit is down (dewatered and not generating power) three or four weeks, time constraints mean we don't typically install scaffolding and stage welding equipment," said Neumann.

Cavitation repairs were delayed in recent years because of constraints caused by flooding in 2011, flood-related repairs, water requirements and other impacts. "Since the last time we placed the scaffolding, safety requirements have changed," said Mike Welch, Power Plant Superintendent. The repair process involves closing the intake gates; dewatering the draft tube; placing the scaffolding deck and scaffolding to access areas requiring inspection and repair; performing inspections; marking every pit larger than a salad plate on exposed surfaces in the draft tube; removing and cleaning damaged surfaces; and welding and grinding stainless steel to repair damaged areas. Because of changes to



The shiny areas show where previous cavitation repairs have been made. The yellow areas show new areas of cavitation that will be repaired during this maintenance period.

safety requirements, the entire process is being documented and closely monitored.

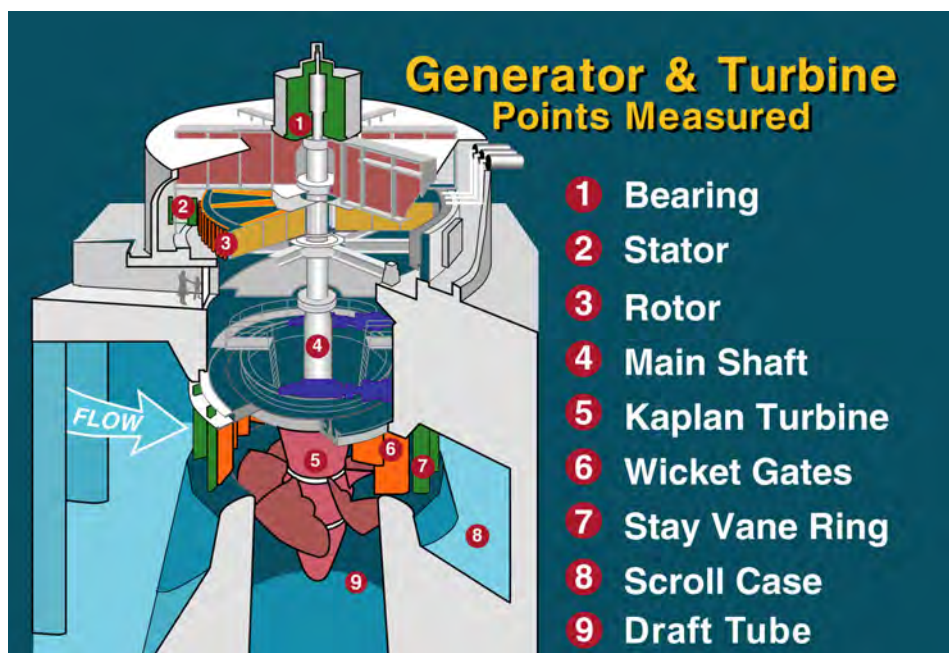
"The documentation taking place will be used as a training tool and help others better understand the cavitation repair process," said Welch. "We're watching ➤

(continued from previous page)

of the OMEE process. This process can and has opened new options for government facility managers.

POCs are Mike Hunter, 256-895-1158, mike.hunter@usace.army.mil and Crystal Bennett Echols, 256-895-1053, Crystal.B.Echols@usace.army.mil.

Mike Hunter is the OMEE Program manager and Crystal Bennett Echols is the OMEE Branch chief in the Medical Division, Installation Support and Programs Management Directorate at the U.S. Army Engineering and Support Center, Huntsville.



Labeled graphic of a generator and turbine like that at Gavins Point Dam.



Multi-Agency Team Manages Careful Excavation at 4825 Glenbrook Road

by Brenda Barber, Clem Gaines and Andrea Takash

After almost a year of preparation including equipment placement, intense training and multi-agency coordination, the U.S. Army Corps of Engineers, Baltimore District's Spring Valley team started turning dirt in September, excavating the key investigation site in the Spring Valley neighborhood in Washington, D.C.

People passing by 4825 Glenbrook Road probably noticed the site's enormous transformation. A stately colonial brickhouse once stood on this half-acre property, now owned by American University. After thorough coordination and input, the house was demolished in November 2012, making it the first house to be removed at a Formerly Used Defense Site (FUDS).

The house demolition marked completion of the first phase of the cleanup of the property, which was used in World War-I for research and testing of chemical agents, equipment, and munitions at the former American University Experiment Station (AUES). Once crews demolished the house they began preparing the site for high probability operations. The team uses the phrase high probability to emphasize the likelihood that they will find and remove chemical warfare materiel in specified areas of the property.

"Staff from across the Corps of Engineers, Department of the Army, Environmental Protection Agency, District Department of the Environment and American University worked tirelessly to get to this point of the investigation,"

Acronyms and Abbreviations	
AUES	American University Experiment Station
CAFS	Chemical Agent Filtration Systems
ECS	Engineering Control Structure
FUDS	Formerly Used Defense Site
MINICAMS	near real-time air monitoring system

said Brenda Barber, project manager. "This is a very complex environmental cleanup project, and we are using proven engineering control technologies to protect our workers and the community throughout the process."

Each of these key pieces of equipment has been tested and used for years at Spring Valley and other FUDS across the country. ➤

(continued from previous page)

scaffolding placement from different perspectives using photos and video to record the work inside the draft tube as well as having experts evaluate the scaffolding structure and the team's safety practices," he added. The hydropower mechanic career field is unique with its own learning curves. Among the project team is Dale Stibral, a rehired annuitant, who retired after 35 years as Gavins Point's Senior Mechanic.

"Bringing Dale back has been an asset because each plant has its own history of operating or maintenance needs. There are some things a person may see once or twice in a career and Dale has that background," said Neumann. "When we ask for something, he knows what we need and where it is. Together, we provide mentoring and training for the crew to prepare them for additional future

responsibilities."

Structural engineers and safety personnel watched the project crew place the scaffolding to determine if there were recommendations for improving safety. "The scaffolding is well made and quite sturdy," said Sean Denning a structural engineer. "This is the first maintenance platform we're evaluating with the new safety criteria, so we'll use what we learn to assess scaffolding at other main stem dams."

Annette Fowler, a safety specialist, was also looking to improve worker safety. New requirements for Turbine Maintenance Platform safety were scheduled for spring 2014 publication. The Omaha District Operations Division, which oversees project operations at the six Missouri River main stem dams, began proactively evaluating processes and equipment against the new requirements. "This provided an excellent opportunity to observe the installation process

and compare it to the new safety requirements," said Fowler. "Installing platforms and scaffolding can expose personnel to hazardous falls. Among my observation goals was to focus on fall hazards and provide methods to improve fall protection systems."

Cavitation repairs in the draft tube for unit three concluded mid-March. Additional projects include replacing three power transformers and rehabilitating the spillway's tainter gates. Work has moved to unit two for annual generator maintenance, to install new un-watering and drain valves, to install a new motor control center, and replace switchgear equipment.

POC is Eileen Williamson, 402-995-2417, eileen.l.williamson@usace.army.mil

Eileen Williamson is a Public Affairs specialist with the U.S. Army Corps of Engineers, Omaha district.



(continued from previous page)

Where the former house stood, now you see the

- 1) Engineering Control Structure (ECS), a 60'x80'x27 tan tent with its polyurethane material pulled taut over a metal skeleton. This tent is secured to the ground, and kept under negative air pressure by the
- 2) Chemical Agent Filtration Systems (CAFS). This means that no air will escape from under or around the tent. Assurance that the tent is under negative pressure has been tested and proven by Edgewood Chemical and Biological Command, one of the multi-agency team members. Under the ECS, workers, in full personal protection equipment are using an excavator and at times digging by hand, to excavate soils down to bedrock to find and remove any AUES debris. The CAFS are connected to the ECS by a large duct, a large aluminum tube similar to HVAC ducting that allows the air inside the ECS to be transferred from the ECS to the CAFS for treatment. The three CAFS are large pieces of equipment, each with multiple carbon filters to clean the air coming from the ECS. The CAFS has a unique feature called
- 3) noise dampeners to ensure that their operating noise level is within the Washington, D.C. guidelines (55 decibels) at the edge of the project. Additionally, a
- 4) continuous near real-time air monitoring system, called MINICAMS, has been installed on the site in trailers near the CAFS. While it looks like a trailer from the outside, the inside of the MINICAMS is a high-tech monitoring and near real-time analysis of the air coming out of the ECS. Its

monitors, located in the CAFS, look for key chemicals in the airflow. If a sensor notes a chemical of concern, the technicians from the Edgewood Chemical Biological Center alert the site leadership. Coordinated protocols have been established with extensive situational training on how to respond.

Coming up a steep hill at the back of the property, sits the command trailer and the worker's break trailer. This is the nerve center for the entire site. From here, project leaders have radio communications and visual oversight of the project area. In addition, 360-degree-view cameras inside the ECS provide the site leadership with an immediate update on excavation operations as the three-person dig team works deeper and deeper into the soil.

The dig team wears a full personal protection equipment ensemble, including a breathing apparatus. Site leaders carefully review the weather each day and adjust work schedules if local conditions could cause a safety issue. A site crew of approximately 50 workers, representing multiple agencies and organizations, are onsite every day during this work. This includes Corps colleagues from the Huntsville Center, Army representatives from the Edgewood Chemical-Biological Center and the 20th Chemical, Biological, Radiological, Nuclear, Explosives Command's Analytical and Remediation Activity, and District of Columbia police personnel. For safety, an ambulance is parked near the command trailers, ready to respond to any injuries that may occur on the site.

During the almost 21-year Spring Valley FUDS project, nearby residents have not needed to shelter in place to avoid a chemical release. However, as an added safety layer, the Corps of Engineers has implemented a Shelter-in-Place system

that includes an evacuation zone, a notification system with a strobe light and siren alerting system to alert residents, and a ring down call system.

There are eight residences and designated American University staff that would be notified if any chemicals of concern are released into the atmosphere. Project leaders have met with these families, and tested telephonic and email notification systems in English and Spanish. This system is tested monthly throughout high probability operations.

Recognizing that this is a high-profile project, Barber and her team have maintained a robust and transparent communication effort. This includes meetings with community members, weekly updates on the District's website, and multiple news media interviews, emphasizing project safety.

"Our communication efforts will continue throughout the remainder of the project," Barber said.

The Corps of Engineers plans on finishing excavation work in spring 2015 and restoring the site to residential standards before returning the property back to American University in summer 2015. To see an interactive tour of the 4825 Glenbrook Road project visit: <http://youtu.be/yVws5UnBuZw>.

POC is Andrea Takash, 410-962-2626, andrea.m.takash@usace.army.mil

Brenda Barber is a project manager for the U.S. Army Corps of Engineers, Baltimore District; Clem Gaines is a public affairs specialist for the U.S. Army Corps of Engineers Baltimore District; and, Andrea Takash is a public affairs specialist for the U.S. Army Corps of Engineers Baltimore District.



Fort Leonard Wood Focuses on Water Sustainability

by Elisabeth Jenicek and Jeannie Elseman

The Engineer Research and Development Center and Fort Leonard Wood, Missouri, are in the fifth year of planning and execution in support of the installation's strategic sustainability plan. A renewed focus on improving water efficiency at the fort emerged from this planning effort with the focus on identifying sustainability goals and objectives and defining a set of tasks to achieve them.

The kick-off for this effort was a Water Day workshop that engaged staff from throughout the post, water technology specialists, and regional experts. The agenda for the day included "Army Net Zero Water: What Does It Mean," "Regional Water Topics," "Low Impact Development Approaches," "Cool Stuff in the World of Net Zero Water," and "What do we care about with water – what's next." The outcome of Water Day was a prioritized list of water issues from the

installation stakeholders.

The list revealed an interest in identifying how much and where water is being used on post. Like many Army installations, Fort Leonard Wood documents water use with the production meter at the drinking water treatment plant. Building-level water meters are used primarily for billing reimbursable customers. Newer buildings, including those certified under Leadership in Environment and Energy Design, also contain water meters but these cannot be read remotely prior to meter data management system-related information technology approvals. For this reason, it is difficult to focus water conservation efforts toward high water use activities.

During June 2013, ERDC's Construction Engineering Research Laboratory deployed an assessment team composed of engineering, planning, and

Acronyms and Abbreviations

ERDC-CERL	Engineer Research and Development Center, Construction
-----------	--

architectural researchers for a week-long site survey to analyze the installation water balance -- that is, an estimate of how much water is used throughout the post. During this week, the team surveyed 25 buildings, installed five water flow recorders, and interviewed staff from a range of installation directorates, tenants, and reimbursable customers about how water is managed across the installation. The results of this effort will be published in an ERDC-CERL technical report later this fiscal year.

Some of the findings from the site assessment include:

Metering: There are a limited number of individual building water meters on post. Installing new meters is a challenge both from a policy perspective and because of the cost. Recommendations will be made as to the optimum locations for new meters to help determine where potable water is being used, in potentially identifying water leaks, and for use in billing reimbursable customers.

Contracts and privatization initiatives: Water conservation and efficiency requirements must be included in contracts and agreements to be applicable to contractors and reimbursable customers. Water technology guidance is being developed that can be easily included in contracts.

Irrigation: Watering is often the greatest use of water on an installation. Sometimes temporary irrigation systems are installed to establish vegetation but never removed. Estimates are being made of the amount of water used to irrigate parade grounds, athletic fields, and the golf course. Irrigation models evaluate current use based on plants and regional climate information, and recommend optimum ➤



Civil engineers set up a flow recorder to on a barracks potable water supply at Fort Leonard Wood. (ERDC-CERL)



82nd Airborne Division Museum Achieves Green Certification

by Jonelle Kimbrough

When one considers the purpose of a museum, one may consider its mission to preserve history. But, would one consider its mission to sustain the future? The 82nd Airborne Division War Memorial Museum considers Fort Bragg's past as well as its posterity. Museum stewards John Aarsen, Jimmie Hallis and Ralph Alvarez have thus committed to sustainability, and the Museum has achieved certification as a "green" agency in the Fort Bragg Green Boot Program and as the first "green" museum in the Army.

One of the oldest museums in the Army, the 82nd Airborne Division Museum was established in 1945. Its mission is to collect, protect and interpret the history of the 82nd Airborne Division. Permanent and revolving exhibits feature artifacts and displays depicting both national and global military campaigns from World War I to Operation Iraqi Freedom.

The Museum exists to preserve the past, but sustainability for the future is a major goal as well. Since sustainability is arguably a "modern" idea, the concept of a "green" museum may at first seem counterintuitive. But, the Museum reconciles the customary with the contemporary quite adeptly. "Our job is to conserve the history of the Division for generations to come, so sustainable practices just naturally suit

some of our efforts," said Aarsen, the museum director.

Aarsen, Hallis, Alvarez and the Soldiers who are detailed at the Museum have indeed implemented common sustainability initiatives such as energy conservation, water conservation and recycling. But, they have also identified very unique opportunities to incorporate environmentally sound practices into their operations. In fact, some of their operations are inherently sustainable.

The Museum must maintain a certain temperature to protect the artifacts in the collections. "Artifacts love cold temperatures," Aarsen explained. "So, we are able to reduce our heating costs and conserve energy." They have also converted some of the lighting in the galleries to energy-efficient Light Emitting Diodes, or LEDs, to protect the collections and conserve power.

Furthermore, some of the exhibits feature reclaimed materials. Among the many exhibits that have graced the Museum's rotating gallery, an exhibit on the Division's participation in the humanitarian aid efforts in Louisiana following Hurricane Katrina featured reclaimed roofs and shipping containers. The Museum constructed an Operation Iraqi Freedom display with repurposed window screens and telephone wires. The

current exhibit on The Golden Brigade in Vietnam features recycled corrugated metal, environmentally preferred carpeting and salvaged ammunition crates. Many of the materials are recovered from construction and demolition sites on the installation, and some items have been obtained from Defense Logistics Agency Disposition Services.

All of the innovative sustainability initiatives have been beneficial to the Museum. "Like many Federal agencies, the 60 museums in the Army are expected to do more with less," said Aarsen. "Participation in the Green Boot Program has been a practical means to lessen both our fiscal and environmental impacts. The benefits of the program are longevity and survivability. We have to consider our future. The Museum connects nearly 50,000 annual visitors with the history of Fort Bragg. We want that legacy to last forever, and we have to be willing to take care of that legacy. Furthermore, we want to show the Army that we are doing our part. We have existed for almost 70 years. We want to exist for another 70 years." For more information on the 82nd Airborne Division War Memorial Museum, visit <http://www.82ndairbornedivisionmuseum.com/>

As the military's first "green" certification program, the Green Boot Program is ➤

(continued from previous page)

irrigation strategies to maintain green space while reducing water use.

Potable water distribution system: Water distribution system condition is often not considered until failures occur. Piping leaks not only waste water but can cause extensive damage if they occur in built areas such as beneath roads. A water infrastructure assessment is being conducted that will evaluate system condition and estimate annual water



main replacement costs.

Water pricing: The billing calculated for reimbursable customers does not incorporate all system costs. Understanding the real cost of water can more honestly inform prioritization of operation and maintenance projects. The cost to produce potable water on post is being evaluated to consider even those items not included in the Army guidelines.

These initial water efforts by Fort Leonard Wood and ERDC-CERL

personnel ignited an interest in identifying actions that can improve water efficiency.

POC is Elisabeth Jenicek, 217-373-7238, elisabeth.m.jenicek@usace.army.mil

Elisabeth Jenicek is a senior research engineer at ERDC's Construction Engineering Research Laboratory in Champaign, Illinois. Jeannie Elseman is the utility program manager in the Directorate of Public Works, Fort Leonard Wood, Missouri.  



Photovoltaic Technology in the Huntington District

by Brian Maka

Photovoltaics technologies have been deployed to eight U.S. Army Corps of Engineers Huntington District lakes largely due to the efforts of Denis Chabot of the Readiness Branch of the district's Operations Division.

A sustainable energy source, photovoltaics generate solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Solar photovoltaics is now, after hydro and wind power, the third most important renewable energy source in terms of globally installed capacity. Solar photovoltaics may be ground-mounted or built into the roof or walls of a building.

In 2011 Chabot submitted a request through an Army Corps of Engineers competition for funding for Green Energy projects. Through the competition the



Photovoltaic solar panels installed on the roof of the maintenance shed at Beach City Lake in Beach City, Ohio.

district was awarded \$1.26 million, of which more than \$800,000 was to be used to install photovoltaic solar panels at eight of the district's lakes. These lakes include Beech Fork and Yatesville in the Big Sandy Area in West Virginia; Atwood, Beach City, Charles Mill and Leesville in the Muskingum Area of Ohio; and Delaware and Deer Creek in Ohio's Scioto Area.

Most of the solar panel arrays at our projects are ground mounted. The one exception is at Beach City where the solar panels are mounted on the roof of project maintenance office. Each array is on a fixed mount that is trained in the optimal direction to be able to generate power year round.

The photovoltaic solar panels are virtually maintenance free, but some challenges do exist. On cloudy days the panels' performance will be noticeably depleted. Snow cover also depletes performance, but the heat generated by the dark-colored panels quickly melts the snow. Occasionally, dust may cause problems, but the next rainfall should alleviate any temporary degradation in efficiency.

The panels have a 25-year warranty that their efficiency will not dip below a 75 percent efficiency rate. This means that the panels will be producing electricity for many years to come. The panels, when operating at maximum efficiency, are expected to generate 142 kilowatt hours daily -- enough electricity to power 1,420 100-watt light bulbs every day or the equivalent to powering as many as 62 homes every day.

In the private sector, photovoltaic solar panels provide three major benefits: tax incentives, lower electric bills and solar renewable energy credits. Although Huntington District will not realize tax incentives or solar renewable energy credits, it will benefit from lower electric bills at these eight sites, which will allow the district to continue its missions while



Ground mounted photovoltaic solar arrays like this is the type of installation location found at seven of the eight Huntington District lakes which will receive the solar panels.

(continued from previous page)

an opportunity for units and agencies on Fort Bragg to enhance their missions through resource stewardship. The goal of the program is to reduce environmental impacts at a unit or directorate level, thus securing Fort Bragg as a functional military installation for future generations of Soldiers, Civilians and their Families. For more information on the Green Boot program, visit [http://](http://sustainablefortbragg.com/green-boot-program/)

sustainablefortbragg.com/green-boot-program/

POC is Mindy Love-Stanley, Sustainability Training and Education Coordinator at Fort Bragg Environmental Management, 910.432.8476, mindy.r.love-stanley.ctr@mail.mil.

Jonelle Kimbrough is the media relations manager with Fort Bragg Environmental Management.



Innovative High-Performance Concrete Floor Sealants Prove Successful

by Clint Wilson and Susan Drozdz

The Engineer Research and Development Center and Hunter Army Air Field, Georgia, demonstrated and validated a high-performance concrete floor sealer under a project for the Office of the Secretary of Defense Corrosion Prevention and Control Program. The sealer is unique in that it uses nano lithium technology to both seal the concrete and densify the surface.

Army vehicle and aircraft maintenance facilities often coat their floors to protect them, make them easier to clean, improve lighting in the facility, and for aesthetics. Almost universally, the coatings used are epoxy paint floor coatings that over time are damaged, chip and peel, and are very slippery when wet, unless an anti-skid abrasive is added. These floor coatings typically have a 5- to 10-year life span based on manufacturer warranties. Replacing these floor coatings is both costly and repetitive as the Army's facilities



The new floor sealant is performing well after one year. (ERDC)

Acronyms and Abbreviations

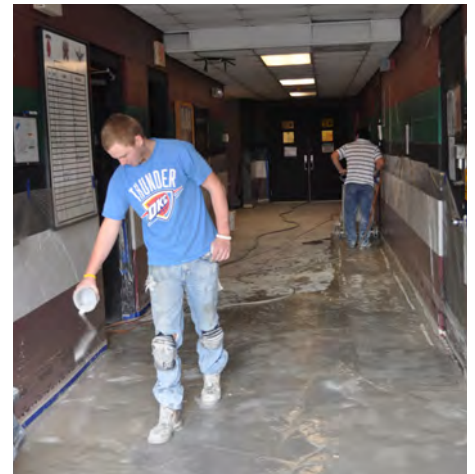
ERDC	Engineer Research and Development Center
------	--

have 50 plus year life expectancies.

The floor sealer used in this project is a waterborne product which is applied with a mop and absorbs into the concrete. The sealer reacts chemically with concrete to provide a permanent hydrophobic surface. It hardens and densifies the surface, making it resistant to damage and abrasion. This sealer also forms a chloride ion screen which provides protection against salt penetration to prevent corrosion.

This project removed an existing epoxy floor coating in six heavy vehicle maintenance bays and support areas, including tool rooms, which was deteriorated and scheduled to be replaced. In the offices and hallways, vinyl tile was removed from the floors. Once existing flooring was removed, the concrete floors were ground to a high polish and the sealer was applied. This process resulted in highly polished floors which were very hard, chemically resistant, and water resistant.

During one year of use and observation, the unit personnel were pleased with the performance of the floors. Concerns that the glossy floors would be slippery were not realized as the floors, when wet, have nearly the same slip coefficient as unfinished concrete and are much less a slip hazard than an epoxy coated floor.



A worker prepares the floor surface for coating. (ERDC)

The floors were cleaned routinely using pressure washers and their maintenance was significantly less than a painted floor.

This is a sealer that should be considered by all Army organizations when they are planning the refinishing of painted industrial area floors for vehicle and aircraft maintenance facilities, warehouses, and maintenance shops. For more detailed information, please contact the authors.

POC is Clint Wilson, 217-373-6742, Clint.Wilson@usace.army.mil

Clint Wilson is a senior research civil engineer and Susan Drozdz is a senior research chemist at ERDC's Construction Engineering Research Laboratory in Champaign, Illinois.

(continued from previous page)

reducing greenhouse gas emissions.

Chabot, a Huntington District environmental engineer for the past 30 years, led the efforts to achieve funding and emplacing the solar panel arrays at the eight projects. Scott Pittman, Jonathan West and Chris Mount from Engineering Construction Division

assisted Chabot in his efforts.

The work would not have been possible without the plans and specifications developed by the contractors Third Sun Solar and Solar Energy Solutions. The critical task of supervising the solar array installations fell to Huntington District employees Dave Callahan, Dan Fanning, Scott Collins, Bonnie Maki, Ben Odel and Tim Conkey at their respective projects.

"It was a distinct privilege to know that these solar arrays will have a positive impact long after I move on to retirement," Chabot said.

POC is Brian Maka, 304-399-5550, brian.maka@usace.army.mil

Brian Maka is the chief of the public affairs office for the Huntington District, U.S. Army Corps of Engineers.



Bulletin Offers Guidance for Managing Unpaved Roads on Installations

by Muhammad Sharif and Harold Balbach

Every installation has roads which do not have permanent surfaces. Some are covered with gravel or crushed stone, while others consist only of graded soil. Over time, these non-permanent surfaces lose material which then moves downslope into waterways. Army Regulation 200-1 and the Clean Water Act contain very general guidance on ways to minimize the impact of soil losses from unpaved roads and trails. Public Works Technical Bulletin 200-1-117, “Mitigation of Environmental Impacts from Unsurfaced Roads,” available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_117.pdf, provides both general guidance and examples of specific techniques to minimize this soil loss, thus reducing impacts to water bodies on the installation.

The PWTB states a variety of objectives. Among them are the recognition that safe roads promote sustainable installations and good-neighbor relations with adjoining lands, identification of pollutant sources such as erosion, sediment, and dust pollution associated with roads, to gain a better understanding of environmental problems that can result from unpaved

roads and provide guidance on corrective measures, and to understand that all these concerns are ultimately associated with the safety of the roadway and the furthering of mission-effectiveness.

Managing Erosion

The movement of soil and other surface materials from the road surface is an example of natural erosive forces, usually water, but sometimes wind. Water flows downhill and the greater the slope, the more the force with which the water dislodges surface materials. Rock, gravel, soil, and sand are all moved if the force is great enough. Therefore, much of the response to erosion control becomes management of water flow. Erosion of unpaved roads and their drainage systems (usually roadside ditches) is the single-most significant factor in costs involved with these types of roadway systems.

The most frequent source of road degradation on Army lands is shoulder erosion, where the edges of the roadway erode and are carried down the drainageways. Some other causes of erosion on unpaved roadways include use of erosive road-fill soils for repairs, selection of

Acronyms and Abbreviations

4WD	Four wheel drive
PWTB	Public Works Technical Bulletin

unsuitable shape and size of coarse surface aggregate, poor subsurface and/or surface drainage, incorrect roadway cross-sectional shape, and lack of attention to traffic parameters such as vehicle speed, volume, and weight. Guidance as to how to prevent or minimize these problems is included in the PWTB. It is also noted that incorrectly scheduled road maintenance, for example, when the soil is too wet, may lead to continuing problems which can linger for the rest of the year. The above list of erosion factors is not all-inclusive; however, it should make apparent the scope of the problem and the need for comprehensive guidelines to reduce roadway costs through erosion control on unpaved roads

Roadside Ditches

Drainage off the road surface is vital to long roadway life. This drainage is commonly done either by placing aggregates on the road surface (gravelling or “improving”), or by cutting drainageways along the road (ditching) to carry water away. If well done, they may be vital, or at least helpful. If not well designed and executed, they may become problems in themselves. Deep ditches along steep slopes may cause as much or more soil loss than from the road surface. The flows in the ditches may also undercut the road surface material, allowing it to erode into the ditch and be carried off with the water.

Conversely, too-shallow ditches may result in standing pools of water that cover the roadway, and create mudholes. The PWTB examines these and many other causes for road failure, and provides references and guidance to sources for solutions appropriate for Army installations. For example, one suggestion to help if ditches run too fast and are cutting channels under the road is to create runoff discharge outlets (turnouts) from the ditches so that the runoff is spread ➤



A team surveying road maintenance is caught when their 4WD truck slipped off the (possibly too-high) slick clay crown into a too-deep roadside ditch. (M. Sharif)



Bulletin Offers Guidance for Managing Non-Native Invasive Species

by Harold Balbach

The 1999 Presidential Executive Order 13112, "Invasive Species," tasks all U.S. government agencies to (among other things): prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; and monitor invasive species populations accurately and reliably. "Public Works Technical Bulletin 200-1-131, Non-Native Invasive Species Management Guidance, available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_131.pdf answers some of the many questions which arise about management costs and potential detriments to mission capabilities due to invasive species on Army installations.

The required response has resulted in the need to develop policy and procedures that effectively identify and manage such issues in the installation setting. Management of invasive species generally consists of three stages: (1) preventing the introduction of propagules of the species (including seeds, spores, roots, and other viable stages of the life cycle); (2) identifying initial

introduction and applying control measures to prevent widespread establishment; and (3) implementing a long-term control plan if there is a successful invasion. The guidance in this PWTB is mostly directed at the first stage—that is, preventing initial introduction.

Prevention

Unless there is a confirmed problem, land managers may perceive the effort required for prevention as more time-consuming than appears to be justified. The logic often is: "If we don't have a current problem with that species, then we cannot justify spending time and money to avoid invasion." This logic can be a large hurdle to overcome. In addition, Army programs themselves often do not focus on prevention and instead focus only on remediation.

Certainly the best way to control weeds is to prevent them from taking root or becoming established in the first place. Some guidelines for preventing weeds from entering public lands are included in the PWTB, arranged by the most common vectors of invasion. The conclusion here

Acronyms and Abbreviations

PWTB	Public Works Technical Bulletin
U.S	United States

must be that invasion is inevitable unless attention is given to the many ways that invasives enter the installation, and methods are created for minimizing such entry. For example, one relatively simple preventive measure is to require that all construction equipment, heavy trucks, and forest harvesting machinery be cleaned before entering the installation.

Controlling Spread

When invasive species have already been found on the installation, three management activities should be implemented. First, determine with as much accuracy as possible just where each invasive species on the installation is now located and how extensive the population is. Second, develop processes to identify which persons or units have used those locations recently or propose to use them in the near future. Third, prepare an action plan which will provide for the vehicles and equipment exiting those sites to be cleaned before they can spread soil and seeds ➤

(continued from previous page)

onto the adjoining surfaces rather than continuing to speed its way downhill.

Long-Term Maintenance

Maintaining the proper structure and condition are the keys to environmental control of an installation's unpaved roads. A basic but often overlooked item to appreciate is proper shape of the roadway's cross section. The road surface must have enough crown to drain water to the shoulder, but not an excessive crown that would make the road unsafe to travel. Also, a ditch must be established and maintained to drain water away from the roadside. In addition, culverts and bridges at the right location and elevation are essential


for carrying water under and away from the road.

Any road rehabilitation for environmental concerns should begin by identifying the cause of the damage or degradation. Identification of the problem's source is more important than making routine repairs to address the problem at road surface level. Ignoring source identification and the cause of the degradation will only exacerbate the problem over time. A safe transportation system, including unpaved roads, is essential to the military's mission goals. In fact, roads maintained in an environmentally friendly way may have more structural strength, suffer less deterioration, and have fewer defects, all of which combine to make them safer.

And, finally, don't neglect to evaluate the effectiveness of repeated temporary versus permanent rehabilitation measures, even where the latter may be more expensive.

Numerous tables and references in the PWTB include specific examples of programs and approaches which have been developed and applied by other agencies in fighting this problem.

POCS are Muhammad Sharif, 217-373-5843, MUHAMMAD.SHARIF@USACE.ARMY.MIL; and Harold Balbach, 217-373-6785, HAL.E.BALBACH@USACE.ARMY.MIL

Muhammad Sharif is an agricultural engineer and Harold Balbach is a research biologist with the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Illinois. 



(continued from previous page)

to areas currently not infested with the invasive species.

Long-Term Control

This last step in the control process is by far the most discouraging for most installations. The reason for this is that any real progress is often hard to see; the weeds continue to grow in many areas, including those where control was attempted. Most aspects of a continuing program which addresses known weed populations and locations are outlined in Technical Manual 5-629, "Weed Control and Plant Growth Regulation." This manual, however, does not specifically address invasives prevention or the management of invasive species.

The recommendations for establishing and operating a long-term plan generally reflect the steps given earlier (i.e., first prevention, then control and monitoring). The long-term control plan should recap the steps already presented above. The beginning step is to establish a focused prevention program. Second, develop a systematic way to inventory the infested areas and to monitor the success of control efforts. Third, create a long-term control plan which uses the approach and inventory to determine which actions are working -- as well as which are not -- so that control activities for future seasons may be related to the records for the benefit of successive land managers.

Numerous appendices in the PWTB

include specific examples of programs and approaches which have been developed and applied by other agencies in fighting this problem. One example is a vehicle undercarriage washing system developed by the U.S. Forest Service which, along with the U.S. Army Engineer Research and Development Center, tested its effectiveness in preventing transport of invasive species on Army installations.

*POC is Harold Balbach, 217-373-6785,
HAL.E.BALBACH@USACE.ARMY.MIL*

Harold Balbach is a research biologist with the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Illinois. 



The U.S. Forest service developed an undercarriage washing system to clean vehicles that may have traveled through invasive species areas to minimize spread to other areas. (H. Balbach)



Low Impact Development: Bulletin Offers Best Practices

by Muhammad Sharif and Harold Balbach

Army Regulation 200-1, “Environmental Protection and Enhancement,” and Executive Order 13514, “Federal Leadership in Environmental, Energy and Economic Performance,” provide a general basis for maintaining environmental and resource conservation programs. Low Impact Development refers to a general approach to reduce the volume of stormwater runoff at developed sites, and Unified Facilities Criteria 3-210-10, “Low Impact Development,” provides criteria for such practices as applied to all new construction projects, while indicating they may be retrofitted to existing facilities as well. Public Works Technical Bulletin 200-1-121, Stormwater Best Management Practices for Low Impact Development (LID) Infrastructure, available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_121.pdf answers some of

the many questions about how best to identify Best Management Practices for implementing LID infrastructure on Army installations.

For more than a century, the preferred approach to managing stormwater was to move it as rapidly as possible off the site. As the proportion of impervious surfaces (pavements and roofs) increased, so did the volume and intensity of the runoff. When LID was first introduced in the late 20th Century as a more appropriate method of stormwater management, many of the first questions were considered technological, i.e., how can we build these into our projects? With over a decade of LID practices and programs now successfully implemented, the technological issues — while still an important area of research and consideration — are not the greatest blocks to more widespread use of these controls. It is now institutional and cost issues present the largest impediments to broader LID adoption. What are the best practices to follow in the 21st Century?

Concerns with conventional stormwater management Alterations to the hydrologic condition result in changes to almost every aspect of surface runoff. Many impacts of stormwater runoff are summarized below.

- Increased runoff volume is the primary driver of the downstream impacts of development.
- Increased peak flow rates are a combination of increased runoff volume combined with reduced time of concentration because of runoff from paved surfaces.
- Base flow and sediment loading changes increase the “flashiness” of streams, resulting in elevated flows during and after storm events, which then erodes stream banks, increasing in-stream sediment loads.
- Habitat modifications and stream morphology High volume erosive stormwater can destroy habitat for fish, amphibians, and invertebrates.

Acronyms and Abbreviations

BMP	Best Management Practices
LID	Low Impact Development
PWTB	Public Works Technical Bulletin

- Runoff temperatures, particularly from paved areas, may have a much higher temperature than normal for the receiving water, where it impacts aquatic organisms.

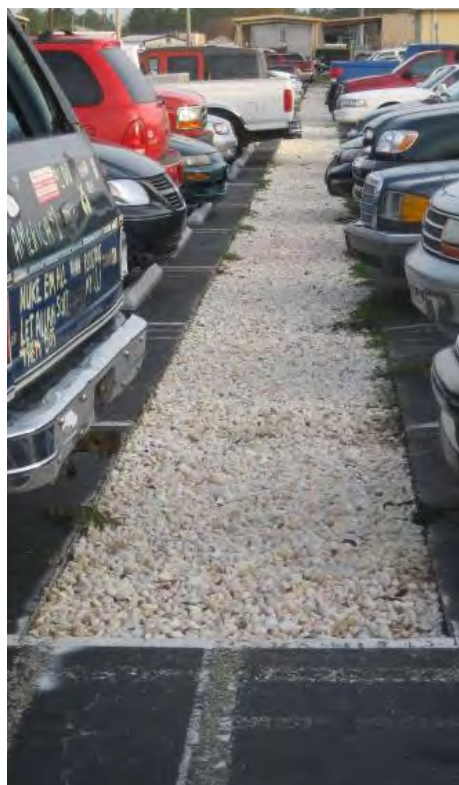
Best Management Practices

The ideal LID BMPs are small-scale, distributed stormwater management devices that act as source control measures, closer to the place where the rain falls, rather than applied to the “end of the pipe” after large volumes have already been concentrated. In general, they use three basic principles: 1) treat runoff as close to the source as possible, 2) manage stormwater at the surface, and 3) maximize soil and vegetation contact during treatment.

Numerous appendices in the PWTB include specific examples of each of these approaches which have been developed and applied on Army installations as well as by other agencies. The LID measures need not be complex, or require elaborate engineering approaches. One example is a runoff infiltration feature installed at Fort Bragg, N.C., to help manage runoff from a heavily used parking lot. A trench was cut between the parking rows, and filled with gravel. Rainwater flows into the trench, which retains thousands of gallons of water, gradually releasing it to recharge groundwater.

POCS are Muhammad Sharif, 217-373-5843, MUHAMMAD.SHARIF@USACE.ARMY.MIL; and Harold Balbach, 217-373-6785, HAL.E.BALBACH@USACE.ARMY.MIL

Muhammad Sharif is an agricultural engineer and Harold Balbach is a research biologist with the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Illinois. 



A runoff infiltration system was installed at Fort Bragg. (Fort Bragg)



IMCOM's DPW Analysis & Reporting Tool (DART) - Pilot Site Report

by John Alexander and Jerry E. Clark

One of the latest examples of IMCOM's partnership with Army Installations is a new initiative called the "DPW Analysis & Reporting Tool (DART)." DART is a GFEBs "dashboard" which allows decision makers to view and understand GFEBs data and DPW performance trends. DART integrates and combines GFEBs data into interesting and informative graphs, reports, and tables. Currently, IMCOM is testing DART at two pilot sites: Fort Leavenworth and Fort Riley. These sites will help IMCOM define user needs while getting the bugs out before DART is available Army-wide. An important goal of DART is for IMCOM to help GFEBs software developers understand functional requirements for the forthcoming Business Intelligence (BI) GFEBs module. BI is expected to specifically address DPW reporting needs and allow DPW management to measure performance and efficiency.

Fort Leavenworth DPW is glad to have been a part of the DART pilot. While we initially greeted the concept with apprehension, we – and our customers – have been greatly rewarded. With DART, all DPW operations are enhanced.

DART Features

- One Data Source - GFEBs No Dual Entry
- Standard Entry Practices Enforced
- Data Integration across Multiple T-Codes/Variants
- Embedded Systematic and Integrated Quality Control
- Information Available to Many Stakeholders
- Graphic, Hyperlinked, Sorted, Filtered Reports

How? Simply by adding accessibility and visibility, imbedding quality, and assigning accountability to our data and process steps.

Data Standardization Enforced with One Data-Entry Source: GFEBs!

DART is not a transactional system: No data is entered or updated in DART. DART merely integrates and portrays GFEBs-entered data. DART helps DPW use GFEBs more effectively while also allowing management to focus on critical customer service needs. Data Quality is fundamental to Fort Leavenworth DPW's (and IMCOM's) success. DART enhances data quality, while adding inherent data-entry standardization. With DART, while Fort Leavenworth gets the data and performance reports that we need to optimally manage our work, IMCOM can harvest accurate information from our standardized GFEBs dataset.

Integration across Multiple GFEBs Transaction Codes

Collecting and analyzing data across "Transaction Codes" in GFEBs is difficult and requires continuous practice, special expertise and multiple certifications. With DART, functional data is automatically integrated so that DPW management can make quick, accurate, effective decisions on resource allocation and priorities. A detail of any transaction or record is available via hyperlink from summary charts and lists. For example, in one DART scenario, the user can view all DMOs meeting defined criteria, dive into the details of a specific DMO in that result set, then open any procurement transaction associated with that DMO. From there, the user can open all orders (not just DMOs) assigned to that work center, building, or customer. This information is organized conveniently so that the user can quickly research and analyze pertinent information about status and performance. You can do all of this while your customer (or your Garrison

Acronyms and Abbreviations	
BI	Business Intelligence
DART	DPW Analysis and Reporting Tool
DMO	Demand Maintenance Order
DPW	Directorate of Public Works
GFEBs	General Finance Enterprise Business Systems
IMCOM	Installation Management Command
QC	Quality Control
T- Code	Transaction Code

Commander) is still on the phone

Embedded, Systematic, and Integrated Quality Control

Perhaps the most important DART benefit is imbedded Quality Control. After data integration, DART automatically generates a series of "Fall Out" reports which alert the user that there are potential data-entry errors or inconsistencies in GFEBs. Since data quality is fundamental to so many aspects of DPW efficiency, this systematic QC function has a broad, positive effect on our performance. Fall Out reports include: Potential Duplicate DMOs, Missing Priority, Potential Procurement Bottleneck, or Wrong Site Code, just to name a few. Catching these errors before ingesting them into our processes reduces waste and confusion, and allows us to serve our external customer with confidence.

Information Presented Graphically and Logically to Many Stakeholders

With GFEBs, it is important to limit where users can enter or change data. This limited access adds security and appropriately increases control; however, it also reduces information availability to many users who could influence DPW performance. With DART, raw data is converted into read-only, interesting, informative charts, tables, and graphs. These media are available to many stakeholders, even those without special certifications.

Fort Leavenworth and Fort Riley ➤



Tips for Using Erosion Control Blankets

by Niels Svendsen

The U.S. Army Corps of Engineers released a new Public Works Technical Bulletin to help military land managers make sound decisions when trying to establish vegetation after land rehabilitation efforts. PWTB 200-1-127, “Vegetation Establishment Expectations for Erosion Control Blankets” is posted on the internet at: http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_127.pdf

On construction and land rehabilitation projects, the presence of bare ground is a concern for the compliance and conservation efforts of contractors and land managers. Federal, state, and local regulatory requirements mandate that soil loss be minimized from those sites to preserve soil health and maintain clean waterways. Long-term ecological health of the land also requires that measures be taken to preserve soils in situ. In many areas, the best long-term solution is to establish vegetation. However, many short-term solutions exist to bridge the gap



Svendsen - ErosionControlBlanket.jpg - Erosion control blankets protect a revegetated hilly area from runoff. (ERDC)

Acronyms and Abbreviations

ECB	Erosion control blanket
ERDC	Engineer Research and Development Center
PWTB	Public Works Technical Bulletin

(continued from previous page)

have been partnering with IMCOM to build DART since October 2013. DART’s benefits are positively realized by our decreasing backlog, increasing efficiency, and improved customer service. We’re doing our best to test and “pilot” this initiative before IMCOM rolls it out to the Army. If our pilot program proves successful, we look forward to Army-wide DART rollout as early as FY15. Based on Fort Leavenworth’s experience, we think DART is a great force multiplier for GFEBs users and will help all Army

between bare ground and full vegetation.

Mulches, polymers, and blankets are typical practices used to provide temporary or permanent soil stabilization and counter the forces of wind and rain erosion. This PWTB provides an evaluation of germination and vegetation establishment under several readily available and

DPWs serve their customers better and more efficiently.

POCs are John Alexander, 913-684-8934, john.b.alexander1.civ@mail.mil; and Jerry E. Clark, 913-684-2116, jerry.e.clark.civ@mail.mil.

John Alexander is the chief of the Business Operations Integration Division in the Directorate Public Works at Fort Leavenworth, Kansas. Jerry E. Clark is the chief of the Operations & Maintenance Division in the Directorate Public Works at Fort Leavenworth, Kansas.

commonly used Erosion control blankets. Issues discussed in this report include ECB types, ground preparation and vegetation selection. These factors depend on the size of the affected area, terrain slope, material cost, future precipitation timeframes, vegetation requirements, and whether the chosen product’s installation will be temporary or permanent. Over time, ECBs have increased in popularity due to their relatively low cost, ease of installation, and consistency in application. The manufacturers of these products have a range of different selections available depending on site, climate, and longevity requirements.

POC is Niels Svendsen, 217-373-3448, niels.g.svendsen@us.army.mil

Niels Svendsen is a researcher at the U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory, in Champaign, Illinois.



Monitoring Suspended Sediments: Bulletin Provides Background on Technologies

by Muhammad Sharif and Harold Balbach

Army Regulation 200-1, “Environmental Protection and Enhancement,” provides a general basis for maintaining environmental quality programs. The Clean Water Act sets the principles for maintaining water quality, and has passed the establishment of specific standards for most pollutants to the states. Suspended sediment standards are one of these, and are an important category of pollutant closely related to military installation activities. However it is not always easy to measure or monitor on an ongoing basis. The measurement of turbidity may be an acceptable alternative. Public Works Technical Bulletin 200-1-136, Turbidity as a Surrogate for Estimating Suspended Sediments, available at http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_121.pdf answers some of the many questions about whether turbidity monitoring might be a part of an installation water quality

management program.

AR 200-1 contains policy for environmental protection and addresses compliance with federal, state, and local environmental laws. It also develops and implements pollution prevention and soil erosion control strategies in accordance with applicable federal laws and regulations. The regulation sets forth requirements for reducing pollutants at source to improve environmental quality. The CWA and amendments establish the basic structure for regulating discharge of pollutants in U.S. waters. The federal government does not have a numeric water-quality standard for suspended sediments, leaving it to the discretion of individual states. In this Georgia-based example, the guidelines for that state were followed. A 1975 Georgia act describes the allowable limits from land disturbing and construction activities in terms of turbidity. At present, several other

Acronyms and Abbreviations	
AR	Army Regulation
CWA	Clean Water Act
PWTB	Public Works Technical Bulletin
SSC	Suspended sediment concentration

states are evaluating their water quality standards to include narrative or numeric turbidity and/or Suspended Sediment Concentration standards.

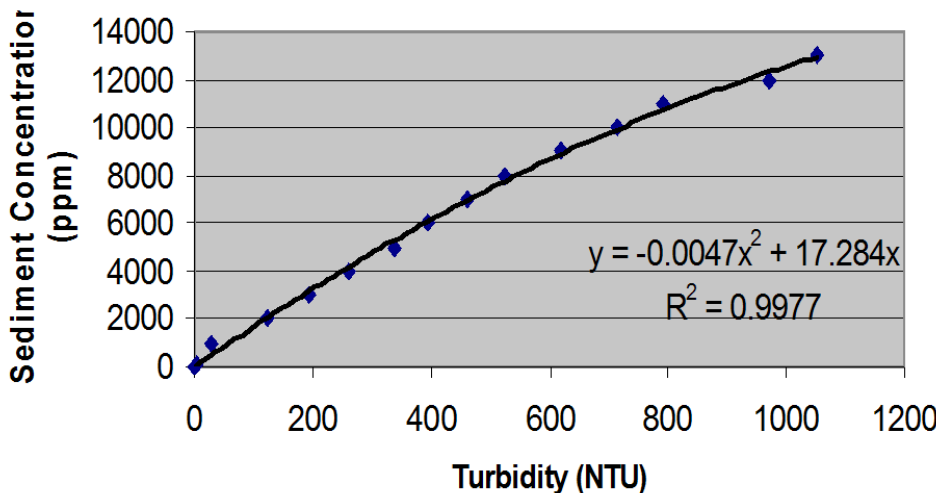
The challenge

Military land-disturbing activities may result in degraded water quality and elevated concentrations of suspended sediments in streams, or both, due to accelerated erosion. Suspended sediments compromise biotic integrity, degrade water quality, reduce aquatic habitat complexity, and result in downstream sedimentation. Other pollutants such as oil and grease, and heavy metals attached to soil particles end up in downstream water. This PWTB presents information on stream water-quality monitoring appropriate for Army installations. Real-time monitoring of sediment loads in streams is expensive, extremely labor-intensive, and may require years of monitored data before decisions can be made. Therefore, it is essential that sampling programs be well designed and diligently managed to prevent “data rich but information poor” monitoring plans. It is essential to have a well planned approach to meet the requirements of federal legislation.

The response

The monitoring of turbidity, a measure of how much the soil particles in the water disperse a light source, is one substitute for withdrawing samples of the water. An advantage is that readings are immediate, and may be recorded almost continuously as needed. The stream water-quality monitoring program

Bonham Creek Riparian



This regression model was developed from laboratory results to correlate sediment concentration with turbidity on one Fort Benning, Georgia, stream.



New Career Program-18 Training Requirements: Army Career Tracker and GoArmyEd

by CP-18 Proponency Team

Our Career Program has a long history of offering top notch training for our Civilian Engineers & Scientists (Resources and Construction). The CP-18 Program Management Office (PMO) has received ample funding this year to centrally fund various Outreach Training programs including CP-18 Department of Army and U.S. Army Corps of Engineers (USACE) training requests, Academic Degree Training applications, developmental assignments and leadership development opportunities. Please work with your local training POC in order to enroll or host a training class within your organization.

We encourage you to establish the

The CP-18 PMO will generate SF-182s for all outreach (group) training. Once approved, each registered student will receive their own individual copy of the SF-182.



following accounts in order to register for ACTEDS funded training and receive centralized funding for your professional development. The primary method for you to receive Career updates from your CP-18 PMO (e.g., newsletters, training opportunities, and announcements) will be through access to the below sites. To ensure you receive pertinent information, it is important that you register in both of the following as soon as possible, if you have not already done so:

1) Go to Army Career Tracker (ACT)

at <https://actnow.army.mil> and create an account/register yourself. You must also identify your supervisor and second line supervisor who in turn must also accept and identify themselves in these roles. This is a CAC enabled system and should be intuitive, although tutorials are available if you need assistance. Then,

2) Go to GoArmyEd at <https://www.goarmyed.com/> and create an account as a student. Your supervisor and second line supervisor **MUST ALSO** ➤

(continued from previous page)

used for Fort Benning demonstrated the value and ease of using an SSC-turbidity model as described. This success establishes that it is possible to effectively use existing stream monitoring stations and sensors without having to rely on expensive physical collection and analysis of water samples containing sediment. An added benefit is that ongoing disturbances may be identified almost immediately and corrected. As previously stated, the lessons learned from this demonstration are transferable to other Army

installations. The main points may be summarized as follows:

- The field data showed a good correlation between turbidity and SSC.
- The sampling, analysis, and reported processes can be auto-mated by using telemetry.
- Other water-quality parameters can be recorded continuously and real-time stream water-quality information telemetered to decision makers.
- Most of the suspended sediment is transported during a few large rain-storm events.
- Automated storm-data collection is essential to effectively capture major

rainstorm events.

The many appendices in the PWTB describe the conduct of the study in detail, and address the differences in regulatory approach in different jurisdictions.

POCS are Muhammad Sharif, 217-373-5843, MUHAMMAD.SHARIF@USACE.ARMY.MIL; and Harold Balbach, 217-373-6785, HAL.E.BALBACH@USACE.ARMY.MIL

Muhammad Sharif is an agricultural engineer and Harold Balbach is a research biologist with the Engineer Research and Development Center's Construction Engineering Research Laboratory in Champaign, Illinois.



(continued from previous page)

create accounts as supervisors in GoArmyEd in order to process your training application and SF 182 (training request). If you have issues creating your account you may contact the GoArmyEd Helpdesk at 1-800-817-9990. (NOTE: If you are a supervisor, please create both your student and supervisor accounts immediately.)

After these 2 steps are complete you will be eligible to request and apply for training that is centrally funded. Assistance with applying for specific training can be obtained through your local training POC.

Please accomplish both registration

processes as soon as possible. We appreciate everyone's cooperation in trying to make this a seamless transition to GoArmyEd. Any questions you have should be addressed through the Career Program 18 inbox at CP18Propoencyteam@usace.army.mil.

Training must be taught in a government facility. Target dates for requested courses should be scheduled between 30 June and 30 September 2014. Employees and supervisors are required to register in the Army Career Tracker (ACT) and GoArmyEd 30 days prior to the start of the training course. Any outreach training request to use these funds must be submitted to the CP-18 Program Management Office.


Acronyms and Abbreviations	
ACTEDS	Army Civilian Training Education Development System
ACT	Army Career Tracker
ADT	Academic Degree Training
CAC	Common Access Card
CP-18	Career Program 18
PMO	Program Management Office
POC	Point of Contact
PROSPECT	Proponent Sponsored Engineer Corps Training
SF-182	Standard Form-182 (Authorization, Agreement and Certification of Training)
USACE	United States Army Corps of Engineers

We are here to assist with any questions or concerns that you may have.

NOTES:

1. Outreach Training. This is the term Army career managers use for many different Army training, education, and development experiences. For example, centralized ACTEDS funding can be used for tuition, travel and per diem and required civilian education system courses (i.e., Foundations, Basic, Intermediate, and Advanced courses), PROSPECT courses, competitive academic degree training (ADT), senior enterprise training and education (e.g., senior service colleges; Federal Executive Institute; fellowships; etc.), and travel and per diem for developmental assignments. The source document is AR 690-950 Civilian Career Management.

POC is Kristi Crear, 202-761-7013, Kristi.l.crear@usace.army.mil

Kristi Crear is the ACTEDS Team Leader with the CP-18 Proponency Team. 



Army civilians and soldiers can electronically access or process education training applications, through GoArmyEd.com



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

