

Public Works DIGEST

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and Construction**

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Tyrone Williams (left) and Will Spence (right), master planners from U.S. Army Corps of Engineers' Savannah District, locate electrical tie-in points while developing plans for the new trigeneration plant at U.S. Army Garrison Natick, Mass. Photo by George Jumara. Page 26

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Planning for sustainable future by embracing master planning

by Maj. Gen. Jeffrey J. Dorko

As we start the second decade of the 21st century, our installations are facing tremendous challenges. We need energy-effective solutions that will sustain our installations for future generations. From the Energy Independence and Security Act of 2007 to Executive Order 13514, *Federal Leadership in Sustainable Energy and Economic Performance*, recent policies have directed us to integrate energy-effective considerations in the planning and development of our installations.

This challenge is tough for our installations. While we need to embrace the tenets of sustainable development, we are faced with the challenge of meeting immediate, rapidly changing mission requirements. Our programming community has zeroed in on helping us meet the short-range program with an aggressive investment strategy that results in a focus on DD 1391 development and, ultimately, design and construction. However, the rapid pace has not allowed us to look beyond the programming horizon to assess the impact of these actions on preserving and sustaining the long-term military capabilities of our installations.

Patterns of sprawl and auto-dependent solutions can quickly consume our limited land. We need to use a new method of planning and development of installations — a recipe that employs the tenets of sustainable master planning that can provide a framework for installation development.

Putting long-term sustainable planning into practice can be a challenge. However, there can be a recipe for success that includes the following key ingredients: leadership, standards, competency and culture.

Leadership

One of the major responsibilities of the garrison commander is to champion the master planning process. To champion



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

planning, the garrison commander must guide the process with a long-term, comprehensive vision for development that fully engages all installation stakeholders.

Garrison commanders have accepted this challenge and are leading the revitalization of their planning efforts. Particularly good examples are found at Fort Lewis, Wash., Fort Hunter Liggett, Calif., Fort Hood, Texas, Fort Sill, Okla., Natick Army Laboratories, Mass., and the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory in Hanover, N.H., where garrison commanders have been effective in championing master planning, leading the process and ensuring that their installations are developed in sustainable and energy-effective ways that meet immediate mission requirements, create great communities and preserve long-term military capabilities.

Standards

A planning process works when the process leads to holistic solutions. I am very excited by the work of our Office of the Assistant Chief of Staff for Installation Management, Installation Management Command and USACE planning team. They are now finalizing the regulation that will govern installation master planning.

One of the key components of the update is the establishment of 10 planning tenets that will guide all planning on

Acronyms and Abbreviations

UFC	Unified Facilities Code
USACE	U.S. Army Corps of Engineers

Army installations. These tenets are the foundation for successful planning no matter what location. In addition, the Office of the Secretary of Defense is working on updating the Master Planning Unified Facility Code. This UFC will embrace many of the practices that the Army is adopting into a tri-service approach.

We are all grateful to Deputy Under Secretary of Defense for Installations and the Environment Dr. Dorothy Robyn for her leadership in this realm. The UFC is projected to be completed by August.

Competency

Successful planning requires skills in planning, comprehensive problem solving and a collaborative environment. The process is synergistic, creates solutions that meet mission requirements and incorporates our planning tenets.

Our planning team has championed an award-winning professional education program that has vastly improved the awareness and understanding of planning. The program is the only one in the federal sector accredited by the American Planning Association. Further, our garrison commanders, as part of the Garrison Pre-Command Course, receive valuable training on master planning.

Through installation outreach and formal classroom training, we have created a broad suite of options to increase planning competency. (*Editor's note: See article about available training on page 41.*) I encourage investment in these training opportunities by you and your organizations.

Culture

The toughest challenge for us in employing the tenets of great planning is changing our building culture. We



Master planning keeps pace with change

by John B. Nerger

Master planning is alive and well across the Installation Management community. As the process garrison commanders use to influence the future direction of real property on their installations, master planning ensures that force structure changes support both the needs of current and new organizations.

Master planning techniques are shifting from the former comprehensive plans to the phased development of area development plans where focus can be applied to areas undergoing the greatest change. Form-based coding is another change that gives our garrisons a tool to ensure new facilities conform to the form and look of their master plans, thereby assuring architectural consistency. The form-based code ensures that the many standard designs conform in appearance to the look of the individual installation whether the design will be used on one of our most historic posts, in the climatic extremes of the arctic and the tropics, or alongside any of the other architectural themes on Army installations.

Aside from assuring architectural thematic consistency, master planning enables installations to plan and program for changes in building density, building adjacencies, central energy and utility



John B. Nerger
U.S. Army photo

systems to meet net-zero goals. Master planning also ensures that sustainable design and development policy changes are included in all facility siting decisions.

Demonstrating the reality of our shift toward master planning, sustainable design and development, Fort Carson, Colo., started an area development plan in December to accommodate force structure changes it is anticipating. A similar study began in January to look at how to attain the net-zero goal at Fort Leonard Wood, Mo.

Master planners continue to depend on legacy databases, such as the Army Stationing and Installation Plan, to define the current and future force structure, and on our current real property inventory and the Real Property Planning and Analysis

System to define facility deficits and excesses.

As commanders' advisors, master planners make recommendations on which excess facilities should be repurposed to satisfy facility deficits. In concert with our installation energy managers, our master planners are able to identify our oldest infrastructure as candidates for major renovation and modernization projects targeted at reducing energy consumption.

The future development plan, developed as an element of the real property master plan, is the method by which garrison commanders synchronize the funding for nonappropriated fund; Sustainment, Restoration and Modernization; and Military Construction work contained in the Capital Investment Strategy. Master planning is the method to ensure annual work plans are used to direct how funds are spent and synchronized with renovation and modernization projects and new construction.

The Real Property Planning Board, chaired by the garrison commander, continues to be an important forum to inform all tenant activities and to ensure that master planners understand the concerns of the senior commander, Soldiers, Civilians and Families.

Master planners are carrying out all

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always face short-term requirements and challenges, and do a great job in addressing them. But sometimes, this comes at the expense of making time available for longer-term planning. This short-term reaction also leads to numerous unsustainable and sprawling solutions that do not help the installation achieve its master plan vision.

We need sustainable and holistic solutions that broadly embed the principles and longer-term vision of the installation plan while still meeting immediate requirements. This includes making sure our standards are flexible

enough to meet the planning principles of the installation. It means looking at more holistic solutions rather than stove-pipe solutions. It means focusing on capacities as much as requirements.

Commitment

With the challenges facing our installations, it is imperative that we commit to sound, sustainable and comprehensive planning that can serve as the foundation for the long-term vitality of our posts, camps and stations. Planning is a collaborative process that involves many stakeholders. Success requires great leadership, consistent

standards, planning competency and a culture supportive of great planning.

In this edition of the *Public Works Digest*, you will read about innovative planning approaches, best planning practices and opportunities for planning education and development. These articles will show how we can create great installations for our Soldiers, Civilians and Families by embracing the fundamentals of planning.

Maj. Gen. Jeffrey J. Dorko is the deputy commanding general for military and international operations, U.S. Army Corps of Engineers.



What about the master planner?

by Allan Carroll

We hear lots about the new master planning regulation to be published with its new tenets and form-based coding. We hear from a variety of sources that our master plans are out of date. But, what about the master planners?

I am talking about the person who must adapt to new planning processes; produce future development plans, regulating plans and illustrative plans; follow a new format using specific geographic information system attributes; follow new sustainable development practices; and ensure it's all resourced in a multi-funded capital investment strategy. Oh yeah, and in their spare time, they plan for and host the next Real Property Planning Board, crank out a few DD Form 1391s to support the latest "good idea," make sure we have identified the buildings for the greatest energy consumption as candidate projects for the next net-zero experiment, validate real property data and Real Property Planning and Analysis System accuracy, answer any number of data calls from higher headquarters and serve as the installation geospatial information and services coordinator.

How many of you have recently attended the retirement ceremony of a senior master planner who faithfully served your installation? What a loss of institutional knowledge! With all the modern day "apps" for smartphones, there should be a Vulcan-mind-meld feature to replicate his or her knowledge in our recently hired interns.

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of these activities and responsibilities at installations on a daily basis. Master planning helps us make the best use of our land, our facilities and our resources for the present and for the future.

John B. Neger is the executive director, Installation Management Command.



*Allan B. Carroll
Photo by Bethany Carroll*

No master plan, regardless of detail and accuracy, can substitute for the institutional knowledge and wisdom of our senior master planners. They not only know where facilities are located and utilities are buried, but where they should go in the future, and, most importantly, they have the answers to the question, "Why?"

Master planners have long benefited from a solid professional development curriculum taught in our Proponent Sponsored Engineer Corps Training courses. These courses continue to improve and are blessed to have a talented faculty who are willing to travel to where the students are located. But training is only part of the equation.

The master planner requires the all important element called experience. Only with experience gained under the steady hand of a seasoned mentor can the youngest master planners build upon their training to develop master plans in support of the installations they serve.

We can corporately accelerate the master planner's learning curve by providing and ensuring attendance at master planning conferences, which offer the latest techniques, procedures and policies, as well as networking opportunities within the master planning community. Often, an issue at one installation has been successfully addressed and solved at another installation. In addition, the implementing guidance for all the recent energy and water conservation initiatives are both lagging and evolving, and a master

planning conference provides an excellent forum for addressing these initiatives.

Experience is gained only when we invest in a stable workforce that has the time to develop an understanding of their complex installations. The cost of experience is time, not money.

In addition to being technically competent and experienced, master planners must be master communicators and team-builders. They must articulate the commander's vision in terms of facilities, utilities, adjacencies, great streets and standard designs while blending their current inventory with programmed construction and maintaining architectural consistency. Team-building skills are critical to ensure that the needs of all tenant activities are considered, accommodated and balanced with the needs, wants and desires of the installationwide population of Civilians and Families, environmental community, training community and emergency providers.

These team-building and communicating skills are also critical when trying to incorporate the latest great ideas from garrison and senior commanders who want changes incorporated right now into the Military Construction Future Years Defense Program that is subject to planning and programming processes that typically will not deliver a complete and usable facility for a decade.

So, the next time you want to critique a master plan or to participate in the master planning process, remember that this is something done by the professional and should not be attempted unsupervised at home. And, if you have a free moment, don't forget to hug your master planner today!

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Creating roadmaps to energy-effective installations

by Jerry Zekert and Mark L. Gillem

“Our military’s heavy reliance on fossil fuels creates significant risks and costs at a tactical as well as strategic level. They can be measured in lost dollars, reduced mission effectiveness and in U.S. Soldiers’ lives.”

– Dorothy Robyn, deputy under secretary of defense for installations and environment, in testimony before congressional subcommittee, Jan. 27, 2010

Deputy Under Secretary Robyn’s challenge to the Department of Defense is to reduce reliance on fossil fuels. Meeting that challenge requires a broadened prospective approach to planning and developing installations and the consumption and use of energy.

By harnessing the comprehensive nature of master planning, military installations can create a broad strategy to achieve energy independence while preserving military capabilities, enhancing quality of life and creating sustainable communities that promote wellness and vitality.

Certain concise planning strategies can reduce direct energy consumption installationwide.

Increased density

Research has found that more dense development uses less energy and emits less greenhouse gas by a factor of 2.0 to 2.5 than less dense neighborhoods. At Fort Lewis, Wash., by following sustainable development principles, vehicle miles travelled could be reduced by 11.4 million miles per year, resulting in a carbon dioxide emission reduction of 12.9 million pounds per year and a per-family annual savings of more than \$1,500.

Density matters in terms of sustainable development. Doubling density beyond 30 employees per acre, or 13 residents per acre, is associated with more than a 30 percent decrease in vehicle miles traveled and total air pollution. When more compact development patterns are used, Rutgers University researchers found that construction costs were reduced: road costs

by 25 percent and utility costs by 10 percent.

Infill, mixed-use development

Planners should support building up rather than out in already developed areas. This strategy of infill development supports increased densities and reduced utility runs.

Mixed-use development reduces parking demands by as much as 30 percent, because parking can be shared among uses with different peak demand periods. Dense or mixed-use zones, facilitating combined heat and power district systems, can double the efficiency of primary energy use in a district. According to the Federal Energy Management Program, concentrated mixed-use development can support district energy systems, reducing carbon generation by 30 percent and energy consumption by as much as 50 percent.

Mixed-use districts also more appropriately balance out energy use. In areas where living and working are within one district, the system can operate at increased efficiencies since energy-use peaks are offset. For example, a chilled water system could have 50 percent diversity resulting in a need to install less air conditioning across the district.

Interconnected street networks

Most installations use a hierarchical street network with few connections and long runs to reach low-density, sprawling development. The direct costs of hierarchical networks include the energy costs for the extra street lights that are needed and the additional traffic lights required to control traffic at the intersections of collector and arterial streets.

On an interconnected street network, the preferred solution, roundabouts replace signals at intersections and reduce energy use. One study found that 25



Roundabouts provide several advantages in traffic flow and reduced costs. Graphic by The Urban Collaborative LLC

roundabouts replacing existing traffic signals in Burlington, Vt., would equate to more than 20 percent of that city’s energy reduction goal. Several studies have also found that roundabouts reduce resource use and pollution, enable higher density land uses and foster increased transit and nonmotorized travel modes.

District energy

District energy systems produce steam, hot water or chilled water at a central plant. The steam or water is then piped underground to individual buildings for space heating, domestic hot water heating and air conditioning. As a result, individual buildings served by a district energy system do not need their own boilers or furnaces, chillers or air conditioners.

The International District Energy Association maintains that district energy systems are 100 percent efficient because the steam or water arrives at the building ready to use. This compares favorably to the 80 percent or less efficiency when burning natural gas or fuel oil at a building. In addition, district energy systems can use the “reject heat” that results from burning fuel to produce electricity at a power plant, dramatically increasing the overall efficiency with which useful energy is extracted from the fuel.

On military installations where sprawl exists, the lines for district energy systems simply run too far, which increases line loss, maintenance costs and inefficiencies. When combined with the reliability of



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district plants, where four chillers take the place of 100 in separate buildings, a more compact layout increases the efficiencies of the utility lines. Also, a district storage system can be used, which adds to cost effectiveness.

Infill development and increased density reduces runs and makes district energy more efficient. District systems can work on a small scale, infill plans obviating the need to redo an entire post. District systems also create room for renewable energy sources now or in the future as technology changes. District systems can use plug-and-play renewable systems, which may not make economic sense on a building-by-building basis.

In district systems, planners can take advantage of the benefits of combined heat and power. A system that can generate heat and power can potentially be 67 percent efficient versus the 33 percent efficiency of a utility-line-dependent system. This efficiency results in overall reductions in energy consumption and allows for the use of renewable sources at an appropriate time.

Building designs

While planning normally does not consider the specific design of a particular building, there are critical building design strategies that can significantly reduce energy consumption.

Solar-ready buildings – Siting and constructing solar-ready buildings can prepare installations for a more efficient future. Building orientation, however, is not as critical with most military buildings, since they are internally heat load dominated. Rather than focus on passive solar layouts, buildings should be designed to accommodate photovoltaic panels, cross ventilation and natural lighting.

Mixed-use buildings – Buildings that combine compatible uses in one footprint can reduce energy use. More floor area can be provided under one roof.

Connected buildings – According to one researcher, connected buildings, like attached dwellings as opposed to separate dwellings, reduce the external envelope exposed to the outside environment and thus reduce heat loss and gain, lowering heating and cooling loads. Other advantages include efficient use of space in the urban context and savings in

construction cost and maintenance due to shared walls. Rowhouses, for example, use up to 35 percent less energy than similar sized single-family homes.

Narrow buildings – In administrative buildings, which account for a sizable percentage of military installation facilities, energy consumption for artificial lighting can account for nearly half of all

energy use. Additional air conditioning capacity is also needed to remove the heat generated by artificial lighting. The first strategy to make buildings like this more sustainable is to reduce the demand for artificial lighting, and the best way to do this is to create narrow wings that allow natural light into the buildings.

Many European countries, for example, limit building widths to less than 50 feet. Many buildings built before the 1930s in the United States and in Europe meet this limit, but with the rise of air conditioning, building widths grew substantially. In some cases, floor plate widths have increased to more than 120 feet. As a result, access to natural light and ventilation was compromised.

More recently, narrow-wing buildings have been making a comeback due to their environmental benefits. In Europe, the first example was built in 1987 for the Netherlands International Bank. The designers employed narrow floor plates, interior louvers in the top third of windows that bounce light to the ceilings, operable windows and interior atriums. The benefits were significant. The former headquarters used 422,801 British thermal units per square foot, but the new headquarters uses 35,246 Btu per square foot, a reduction in energy use of more than 90 percent. The energy savings in 1987 U.S. dollars totaled \$2.6 million annually, and the payback was a remarkably short three months.

Planning and energy

Master planning is a comprehensive process that formulates a development strategy for the long-term use of our installations. Energy use is one of the major considerations that must be factored along with sustainability, low-impact development, and anti-terrorism and force protection.

The recommended planning and design strategies in this article provide a roadmap to evolving into a net-zero installation. Using these techniques prevents the



This energy-effective area development plan involves compact development, interconnected streets and narrow buildings. Graphic courtesy of Jerry Zekert



New direction for master planning

by Kathryn J. Haught

The update of Army Regulation 210-20, *Real Property Master Planning for Installations*, is nearly complete. The old regulation will cease to exist and will be included as Chapter 10 in AR 420-1, *Army Facilities Management*, within this fiscal year. The update will address the question: how can we better execute master planning to assist headquarters' planning and support the installation?

The new regulation continues the use of real property master planning digests, installation design guides, capital investment strategies and long-range components. Employing vision statements has been added, and short-range components are eliminated.

The update accentuates *process* rather than end products. End products are included, though, and have been more clearly defined to more accurately reflect how garrisons do planning.

The new regulation emphasizes 10 planning tenets:

- form-based coding,
- area development planning,
- sustainable development,
- sustainable building design,
- natural and cultural resource preservation,
- planning for healthy communities,
- critical infrastructure risk management,
- anti-terrorism and force protection,
- facility standardization, and
- spatial data management.

These tenets are essential for

constructing a master plan that meets all the needs of the installation, including the needs of Soldiers, Civilians, Families and of the Army as a whole. Army planners have been working with many of these precepts for years. Other tenets are new to the Army master planning regulation, although not necessarily new to installations. Adding these tenets to the regulation and applying them at the garrison level ensures that they will receive the emphasis necessary from decision makers.

The new regulation stresses the use of **form-based codes**, which codify the installation's IDG standards in a graphic plan. This type of code puts less weight on land use and more on building appearance and massing.

While the form of the building will, to a certain extent, drive the function, this type of code will allow for more mixed-use development. Mixed-use development permits greater efficiencies in planning and promotes the conservation of one of the Army's most important and quickly shrinking assets — real estate.

Form-based codes will be used to formulate "illustrative plans" and "regulating plans."

Illustrative plans use form-based codes to depict proposed building configurations. This will help the installation establish the capacity of the installation — an invaluable and long overdue tool for helping headquarters make more informed stationing decisions. Using the requirements data in the Real Property

Acronyms and Abbreviations	
AR	Army Regulation
AT/FP	anti-terrorism and force protection
CIRM	critical infrastructure risk management
IDG	installation design guide
NEPA	National Environmental Policy Act
OACSIM	Office of the Assistant Chief of Staff for Installation Management

Planning and Analysis System for comparison, installations will be able to better plan for existing missions without adversely impacting potential new missions.

Regulating plans replace land-use plans and regulate only the most essential physical requirements for developing parcels, such as buildable areas, minimum and maximum building heights, parking locations and acceptable uses.

The new regulation also emphasizes **area development plans** that can be consolidated into an installation development plan. Area development plans will enable the garrison to consider the installation's missions and plan for each accordingly.

In the past, planning was done without consideration of long-term effects, but the Army has been integrating **sustainable development** and **sustainable building design** now for several years. The Army realizes the importance of preserving not only its own resources but those of the local community, the region and the state.

Sustainability principles help the Army to be more prudent with real estate, natural resources and manmade resources. Sustainable design can be tailored to each particular installation.

Natural and cultural resource preservation overlaps sustainable design in the principle of minimal disruption to ecological and historical assets. These tenets together give planners the tools to provide for their communities' needs while preserving natural and manmade assets.

Planning for healthy communities is one of updated regulation's new tenets. ➤

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diversion of precious range and training areas for solar farms or other dedicated energy production areas. They help create sustainable development that preserves an installation's capability to respond to rapidly changing Army missions.

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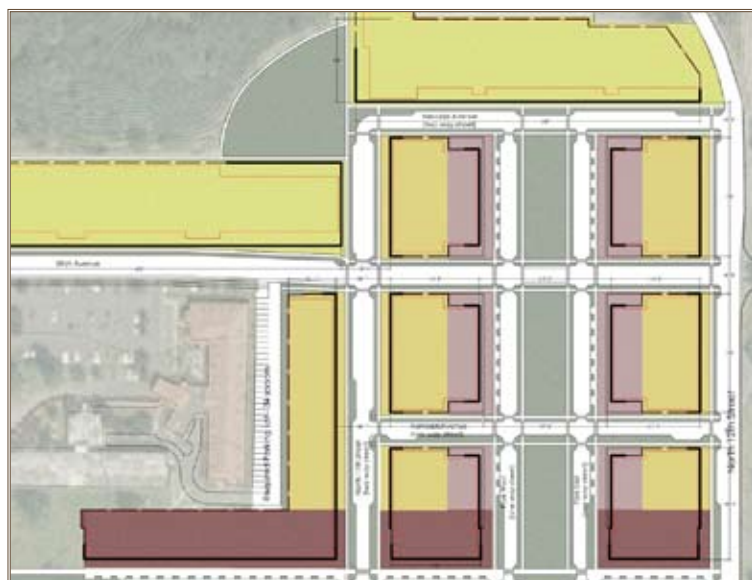
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The idea is to promote exercise and healthy activity via planning that, for example, facilitates walking and biking for access to both work and recreation. Planning for healthy communities also supports other planning objectives, such as low-impact development.

The Army has practiced **CIRM**



Illustrative plans use form-based codes to depict proposed building configurations. Graphics by Urban Collaborative



Regulating plans govern such requirements for developing parcels as buildable areas, minimum and maximum building heights, parking locations and acceptable uses.

with varying success for some time. It is important to prevent mission failure in garrison operations, deployments or support to Army Soldiers and Families. CIRM takes a close look at infrastructure and determines where risk is greatest, enabling mitigation of that risk in the master plan.

AT/FP often presents a challenge but is necessary to protect Army assets, including Soldiers, Civilians and Families. Creative thinking in the planning process can facilitate AT/FP. For example, buffer zones and green space for environmental purposes can serve as standoff space.

The Office of the Assistant Chief of Staff for Installation Management's Master Planning will work with the Army Facilities Standards Committee to ensure that **standard designs** will support the planning tenets of sustainability, real estate preservation, low-impact development and energy conservation.

Geospatial data management replaced the T-square and the drawing board long ago. Geospatial information systems available through Army Mapper allow planning with greater ease and efficiency, and electronic files facilitate data sharing, not just within the installation but also with other organizations.

The master plan is now truly a living document that can be changed with ease by local planners. Better access for viewing an installation's master plan means headquarters has a better understanding of the issues and challenges on the ground.

At OACSIM, the intent is that the updated regulation will put more emphasis on master planning at all levels. The tenets also support National Environmental Policy Act compliance and will make NEPA an integral enabler of master planning rather than a hurdle to be jumped prior to project award.

OACSIM anticipates that the new regulation will promote master planning not as a separate process but as an integral part of garrison planning and operations.

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Call for **ARTICLES**

The March/April 2011 issue of the Public Works Digest will feature

Housing and Lodging

Deadline is Feb. 14

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



Great streets

by Mark L. Gillem

On most military installations, streets are little more than links connecting one place to another in an endless chain of asphalt and concrete. The gaps between these places are ignored and underused. Since these types of streets usually serve only one purpose — motor vehicle transportation — the gaps and edges are often undesirable sites. As a result, vacant land or parking lots usually separate streets from buildings.

This pattern may make for an efficient transportation network, but it also leads to very inefficient land use. Street networks on most installations are designed like river ecosystems; local streets funnel traffic to collectors, which in turn funnel traffic to arterials. These arterials act like major rivers where the bulk of traffic is eventually forced onto relatively few streets that are predictably congested at peak hours and too wide to cross comfortably or safely.

The result is like a cancer that eats away at valuable land. The wider the streets and the more traffic they carry, the less desirable they are as places for development, which then occurs farther and farther out, leading inexorably to low-density, auto-oriented sprawl.

There is a different model. When streets are thought of as magnets that can attract more efficient development, they can become the backbone of an integrated land-use and transportation system.

The planners of historic military bases knew this. They built grand boulevards, avenues, parkways and main streets to both connect and contain development. The grand entry to Barksdale Air Force Base, La., and the well-defined avenues of historic Fort Sill, Okla., are just two examples.

To more efficiently use limited land resources, planners need to reconsider the role of the street. If they can build great streets, then development will be attracted to these streets and thousands of acres of Department of Defense land can be repurposed for development without

the need for additional land acquisition. Moreover, great streets support more sustainable densities, reduced infrastructure runs and more energy-efficient development.

The requirements for great streets are not complex. First, they need to be connected to other streets. George Washington laid out a simple grid for Alexandria, Va., because he knew that this was the most efficient street layout.

Second, great streets have defined edges, which ideally take the form of buildings placed parallel to and facing the street. These buildings create “walls” for the street, much like the walls of a room, which makes them comfortable to walk along. When these buildings have windows facing the street, the transparency allows for natural surveillance of the public realm, which is the best kind of security. The current infatuation with prison-like buildings oriented away from the street is an overreaction to selected terrorist threats that are not an empirical reality for military installations.

Third, great streets have great street trees. The best are deciduous trees that create interconnected canopies shading the street and sidewalks. These trees slow traffic, increase pedestrian safety, reduce energy consumption in adjacent buildings and extend the lifespan of the paving they shade.

Allan Jacobs, author of *Great Streets*, argues that great streets are built to last and are accessible to more than just drivers. Great streets serve pedestrians, bicyclists and all types of transit passengers. Great streets also have sidewalks that are connected, comfortable and safe. All of these criteria make what some practitioners call “complete streets” that serve a multitude of functions.

Planners at Fort Lewis, Wash., adopted these criteria and are converting their main street, Pendleton Avenue, from an unsightly arterial at the heart of the installation into a great boulevard. The



Over a series of steps, Fort Lewis's Pendleton Avenue will be transformed into a great street that accommodates energy-efficient, mixed-use development and a range of transportation choices. Graphic by The Urban Collaborative LLC

current conditions are less than ideal; inadequate throughput, unprotected left turn lanes, disconnected sidewalks, ➤



Understanding planning fundamentals: It's about patterns

by Jerry Zekert

Thinking about great cities, towns or even military installations begs the question, what makes them great? The key aspect of what makes those communities remarkable is how they are laid out, and that factor is the legacy of great planning. Excellent planning results in the structured organization of streets sidewalks, trees, public spaces and the setting of buildings in a compact relationship that results in great places for all generations.

Outstanding cities like Savannah, Ga., Portland Ore., Washington, D.C., and Chicago are well planned. They are towns



A master planning student sketches patterns in Vicenza, Italy. Photo by Jerry Zekert

of multistory buildings with many mixes of uses and sustainable streets with trees and sidewalks, which holistically make great places to live, work and play.

Historically,

many military installations were planned and developed using these principles. Two examples are Randolph Air Force Base, Texas, which celebrates and maintains its commitment to a great sustainable plan, and the old garrison compound of Fort Bragg, N.C., which brings the flavor of Beaux-Arts design to its plan. These patterns reflect the long-standing historic values of community that our leaders desired in our military installations.

In the planning profession, the way these principles are used is called "planning patterns." Planning patterns give us the recipe from which an orderly master plan can be created.

The patterns of good planning are visible to pedestrians. They can see the arrangement of the streets, the general scale of the buildings and the alignment of the sidewalks and trees. These features are the fundamentals of good planning.

In the Master Planning Institute training program, a key component in both the Master Planning and Advanced Master Planning classes is teaching the planning pattern language and how to use it in the planning of installations. Students learn that many of the principles of sustainable

development — including walkability, compactness and reduced energy use — can be gained by learning the traditional patterns of development.

During the Advanced Master Planning class taught at U.S. Army Garrison Vicenza, Italy, last year, the class visited and sketched the traditional urban planning patterns of the town of Vicenza. The trends discovered while sketching were used in the planning exercises. Similarly, in Savannah, the students learned by sketching the traditional grid pattern of that city and using the same principles in solving today's problems.

Understanding planning patterns helps create a flexible but orderly way to plan cities, towns and military installations. They give a predictive suite of planning tools that can ensure the creation of great places for Soldiers, Civilians and Families, while meeting the rapidly changing missions facing our Army.

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overhead utilities and the backsides of buildings make it a street to pass through. As a result, development has been pushed out of the core of the installation and onto the fringe, which forces even more driving.

The approved and funded plan calls for converting Pendleton into a multiway boulevard that can support much more through traffic and transit on four center lanes with a protected left turn median, local traffic and bikes in slow-moving protected access lanes, and pedestrians on wide, tree-lined sidewalks that are framed by infill mixed-use buildings. Jacobs consulted on Pendleton's redesign.

The promise of Pendleton's conversion helped convince the housing contractor

and the Army and Air Force Exchange Service to build pedestrian-oriented development within the downtown core rather than at the edge or in big box structures flanked by massive parking lots. The great street has become a draw for central development that uses limited land much more efficiently. Moreover, the plan for the street generated an unprecedented level of excitement and interest, at least for infrastructure projects, among the installation's leadership, and they quickly found the resources for the upgrade.

The benefits to rethinking the role of streets on military installations are enormous. They can be magnets for sustainable and energy-efficient development rather than eyesores that force development to the perimeter of

an installation. They can be places where people can comfortably and safely walk, bike and drive.

Military planners have an opportunity to once again create the types of streets that contributed to making historic installations great; they can create streets that are built to last and that support multi-modal transit options for generations to come.

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Embracing planning in the research environment

by Mark L. Gillem

“Master planning,” according to Lt. Col. Kari Otto, “is the lynchpin of any organization’s strategic plan and vision.” As the garrison commander for the Natick Soldier Systems Center, Mass., Otto knows the value of planning. She has made sure that NSSC has a current and compelling plan.

“A good master plan,” she said, “excites the work force at all levels. It shows them that leadership acknowledges and is actively addressing infrastructure shortfalls and clearly demonstrates there is a future plan for the installation.”

The U.S. Army has numerous labs like NSSC that are on the cutting edge of scientific research in a range of fields. From high-technology weapon systems to longer-lasting pavements, from more effective body armor to more nutritious meals, Army scientists and engineers are using their skills to enhance mission effectiveness.

Over the last year, two of these Army labs, NSSC and the U.S. Army Cold Regions Research and Engineering Laboratory, have embarked on planning processes that will result in new real property master plans that can more effectively guide short- and long-term development. Just as each lab’s researchers and scientists need to stay on the leading edge of their career fields, the labs’

leaders have recognized that their master plans need to be on the leading edge of sustainability and energy efficiency.

Process

At both labs, the approach has integrated intensive user participation in the planning process. Stakeholders at the installation, including Directorate of Public Works engineers, lab leadership, staff and research scientists have been involved in every aspect of plan development. They crafted their planning visions, analyzed their sites, developed and evaluated alternatives, and helped identify preferred alternatives. This type of involvement is a different approach to planning.

On many installations, planning experts are hired generalists who conduct interviews and site assessments, prepare alternatives and make a recommendation to leadership. In some cases, these outside consultants set up shop at the installation and facilitate a charrette, which brings stakeholders into the design process in a more substantive way. But most charrettes are little more than formal review meetings and scheduled interviews that inform the design team as they prepare alternatives while on site. Stakeholders are not generally involved in the actual design.

This process results in plans that may be technically correct but not emotionally connected. In other words, installation personnel rarely take ownership of the plans, regardless of how good they are.

NSSC

NSSC has fully embraced the new approach to master planning. Through a collaborative process, the installation has developed a plan that accommodates significant new development in a sustainable way. Roughly 25 percent of NSSC personnel participated in its first planning open house, and more than 100

Acronyms and Abbreviations	
CRREL	Cold Regions Research and Engineering Laboratory
NSSC	Natick Soldier System Center
USACE	U.S. Army Corps of Engineers

participants attended the public planning forum. The plan that was developed makes room for new research space, creates shared community parks and calls for more on-post Family housing to reduce the environmental and economic costs of long commutes.

“From a strategic communication perspective, a good master plan is invaluable as it clearly delineates the true requirements of an installation,” Otto said.

Having this information is crucial for the Office of the Assistant Chief of Staff for Installation Management and the Services and Infrastructure Core Enterprise, both of which advocate on behalf of the installations, she said. It demonstrates to all levels of leadership tremendous analysis and validation of legitimate requirements.

CRREL

Located in Hanover, N.H., CRREL is one of the U.S. Army Corps of Engineers’ research labs. Scientists at CRREL focus on extreme weather and related research, and they need facilities that can support this unique mission.

The collaborative planning process at CRREL, which started last fall, includes representatives from across the lab, the town of Hanover, the local school district and nearby Dartmouth University. This process is part of Headquarters, USACE’s focus on planning education using a practicum model through which stakeholders gain valuable education in the planning process and use their new knowledge to help prepare their own master plans. This approach empowers stakeholders and helps them understand the value of planning on their own installation.

“This master planning process for CRREL represents an essential



Participants in the NSSC Planning Open House look over a scale model of the installation. Photo by Dustin Capri



Area development plans: Tools for synchronizing infrastructure

by Jerry Zekert

You have heard the horror stories of Military Construction projects not being built in the same year as their supporting infrastructure projects. Anecdotes abound of mission complexes built without associated community support facilities. How can this happen?

Synchronization of project execution is one of the toughest challenges installations face. No matter how the financial situation is defined, all who are involved in planning, programming designing and constructing facilities for Soldiers must make sure that the comprehensive facilities package is provided.

The area development plan is a critical tool that helps Directorates of Public Works synchronize development of a specific locale on an installation. An ADP is a mini-master plans that identifies the total built-out plan for a particular district and defines a plan for its development.



Jerry Zekert
Photo by Mary Beth Thompson

The plan is holistic. It enables the installation to consider all of the factors that need to be supported, including such comprehensive issues as sustainability, energy efficiency, low-impact development, environmental stewardship, infrastructure and transportation requirements, and anti-terrorism and force protection criteria.

The ADP creates a built-out plan for the maximum capacity of the district that defines both the short-term mission requirements and the long-term capabilities of the district. The plan also develops a holistic capital investment strategy that identifies by phases the comprehensive suite of projects that need to be executed together to make the plan complete. It provides a map and identifies specific siting of individual projects. This graphic portrayal gives program



At Fort Carson, Colo., stakeholders discuss the development of an ADP. Photo by Mark Gillem, Urban Collaborative

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milestone in sustaining our collaborative culture through learning the importance of planning,” said Robert Davis, CRREL’s director, “We have all come to better appreciate the potential role participants can play in developing a new vision for our installation through a process that has incorporated input from all levels and functions in our organization, as well as from the outside community.”

This input has led to an evolving plan that incorporates the latest global trends

in lab design and responds to the local community’s needs.

Advantages

“An installation that can clearly and consistently articulate its strategic vision and the infrastructure requirements necessary to meet that vision is more likely to garner the funds necessary to execute their long term requirements,” Otto said.

Another benefit of the processes used at NSSC and CRREL is that, because

Acronyms and Abbreviations	
ADP	area development plan
AT/FP	anti-terrorism and force protection
MILCON	Military Construction

managers instant identification of all the critical projects that need to be funded as a package to meet the needs at a particular time.

ADPs can be used as tools not only at the installation but also at higher headquarters. They can help programmers make sure investment decisions are adequately defined to ensure all needs are met.

Advice for ensuring that ADPs are successful, invaluable tools follows.

- Make sure the ADPs focus on the long-term built-out capability of the area rather than just the short-term mission needs. Think of ADPs as mini-master plans that define the long-range development strategy for individual districts. This method allows requirements to be nimbly changed over time.
- Ensure all district stakeholders participate in ADP formulation. The ADP is their roadmap for long-term development of their area, so it is essential they participate from the beginning. These stakeholders include experts from the sustainability, environmental and AT/FP communities.
- Make sure the ADP has a defined vision linked to the installation master plan. ➤

the stakeholders participated in the actual design effort, they have taken active ownership in the process, which will facilitate long-term support for and the relevancy of their master plans.

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Work classification: Spotting potential pitfalls in construction

by Mike Dean

Work classification determines a project's funding source, funding limits and approval authority. Work classification is the responsibility of the director of Public Works, and improper work classification can lead to potential Anti-deficiency Act violations, the redelegation of the involved funds to lesser priority projects and disciplinary action.

Construction work is defined by law in Section 2801 of U.S. Code title 10. Specifically, military construction includes any construction, development, conversion or extension of any kind carried out with respect to a military installation whether to satisfy temporary or permanent requirements. A military construction project includes all work necessary to produce a complete and usable facility or a complete and usable improvement to an existing facility. It also includes work to produce a portion of a complete and usable facility or improvement as specifically authorized by law.

Due to misapplications of work classification guides, there has been a sharp



Mike Dean
Courtesy photo

increase in potential ADA violations in the past several years. Descriptions of the top pitfalls follow.

Relocatable buildings

RLBs are a major area of misclassification. An RLB is classified as equipment only if it meets specific criteria. The definition, in Chapter 6 of Army Regulation 420-1, *Army Facilities Management*, says an RLB is designed to be readily moved, erected, disassembled, stored and reused, and that it must meet the "20 percent rule."

That rule states that the sum of building disassembly, repackaging and nonrecoverable building components including typical foundation costs must not exceed 20 percent of the purchase cost. If the percentage is greater than 20,

it must be acquired as real property. This action then follows real property rules, and real property approval authorities apply. Typically, one should think in terms of house trailers with the interior already finished.

The misunderstanding of what composes an RLB and the rush to meet mission requirements has led to a large number of potential ADA violations. An RLB is a construction project if:

- Construction is needed to finish the interior, such as insulation, wiring, plaster wall board, fire suppression, built-in cabinets, lights and heating.
- Construction is needed to finish the exterior, including roofing, siding, windows and doors.
- The building is more than one story high.
- The building can't be easily disassembled and moved down the highway without major expense — more than 20 percent of initial cost without site add-ons — or damage.

Modular buildings are not necessarily RLBs, and any building essentially built on site is not an RLB. Anything acquired as an RLB, which falls into one of these situations, most likely is construction and must meet construction rules, limitations and authorities.

Acronyms and Abbreviations

ADA	Anti-deficiency Act
DPW	director of Public Works
RDT&E	research, development, testing and evaluation
RLB	relocatable building

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This vision, although broad in scope, identifies a set of measurable tenets that guide development. These tenets include such principles as sustainable planning, energy effectiveness, safety and walkability.

- Make sure the ADP considers several alternatives. Diligent alternative formulation leads to great solutions. A bonus comes from considering environmental principles in the process, because many National Environmental Policy Act requirements will have been simultaneously met.

- Make sure ADP investments take in all funding streams, including MILCON; Sustainment, Restoration and Modernization; and public-private ventures.
- Share the ADP with higher headquarters. Master planning champions at higher headquarters work very hard to make sure installations get the resources to support their many requirements. ADPs help them see the total plan, enabling them to understand what you are trying to achieve.
- Take the Advanced Master Planning Class, Proponent Sponsored Engineer Corps Training Course 952, which provides hands-on instruction on completing

an ADP.

ADPs are tremendous planning tools. They can be great assets in synchronizing infrastructure investments, and they are very affordable to complete. In times of competition for limited resources, an installation's return on investment for its ADPs can be high, helping ensure delivery of total facility packages.

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RLBs are improperly "constructed" on site. Photos courtesy of Barry Bartley



Improper "construction" is discovered inside a purchased RLB.

Construction as repair

For excellent guidance on classifying "repair" and "construction" projects, review Department of Army Pamphlet 420-11, *Project Definition and Work Classification*. If work is being done solely to meet codes and standards or to meet mission requirements, the work is construction. A facility must be determined to be failed or failing for it to be brought up to codes and standards as repair.

Increasing the footprint of a facility or significantly increasing the quality or capability of a facility is most likely construction. Repairing and increasing a two-lane road to three or four lanes, adding pull-offs or changing a gravel road or parking area to asphalt is construction. Repair to a building that replaces most of the structure and changes the architectural

style is most likely construction.

Keeping models, simulations and replicas

Building a model, simulation or replica for research, development, testing and evaluation that is later used for training or kept after its initial RDT&E purpose is finished is construction. RDT&E models, simulations and replicas must be removed after their RDT&E requirement has been completed.

Project splitting

Project splitting that avoids construction approval limits is an ADA violation. Work classification for a construction project or a group of construction projects requires that all work that is interdependent be included as one project for approval. This requirement includes site preparation for RLBs.

A recent example involved two RLBs sited on two concrete pads adjacent to each other. Although each concrete pad was constructed as a separate unit, the RLBs placed on them belonged to the same mission and organization. The two concrete pads are considered interdependent because of the single mission and therefore classified as one construction project for approval.

Another example of project splitting is using a series of different projects with different funding sources and methods of approvals to construct a complex of facilities that are clearly mission related. An example of project splitting is building a contingency operating location or a contingency operating base using separate projects for barracks, classrooms, maintenance buildings, utilities and other facilities. A contingency operating location or base is a grouping of interdependent facilities, and all projects should be grouped into one undertaking for one overall approval. In a case like this, the DPW and each organization that approved separate

funding for projects have potential ADA violation.

Facility conversion

Conversion of a facility is construction, but not all work done on a facility during conversion is construction. Any repair work that was necessary to do in the facility before conversion may still be classified as repair. Examples are roof, window and toilet repair.


Any work necessary to convert a facility to a new category code is construction. Examples are adding sensitive compartmented information facility, air conditioning, or anti-terrorism and force protection requirements when a warehouse is converted to an administrative building.

Equipment

Work to install Equipment in Place, equipment obtained as personal property, is classified as "nonconstruction." Any work to install the personal equipment such as running electrical wires or opening holes in walls or doorways to install or move personal equipment, is considered nonconstruction and is funded from the same source of funds as that used to obtain the equipment.

Garrison DPWs are ultimately responsible for all work classifications and should avoid being pressured into making work classifications with which they are uncomfortable. DPWs should be familiar with DA Pam 420-11 and coordinate their work classification with their local legal office.

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Keep safety in mind when planning lean, green, sustainable projects

by Charles Colbert

Leaders everywhere are focusing on creating a lean and green organizational culture that strives for continuous improvement resulting in better projects that are built faster and cost less. As the cultural shift is made, it is important to remember that lean and green does not automatically correlate to acceptable risk, especially from a maintenance worker and system safety perspective.

All Defense Department installations are under programs that emphasize Leadership in Energy and Environmental Design Silver, Gold or Platinum certification. In addition, as resources become precious, installations are becoming more lean and sustainable. Organizations and programs can improve cost savings and efficiency while being good community neighbors; however these concepts must be applied with system safety reviews.

As management leads an organization or program to become lean and green, it must constantly be thinking about assessing risk and determining what is acceptable risk. Safety is the first step in a cultural journey to continuous improvement — plan, do, check, act. Management should want to attain “acceptable risk, lean and green,” which will allow an organization or program to employ best practices and best engineering judgment leading to state-of-the-art facilities.

Systems safety review needs to happen as early as possible in the design process and at intervals contributing to the final design. Army Regulation 385-10, *The Army Safety Program*, directs that facility designs will have a systems safety review; Department of the Army Pamphlet 385-16 details the process; and U.S. Army Corps of Engineers’ Engineer Manual 385-1-1, requires all construction projects to have a safety and occupational health plan as

part of the project management plan. This includes a preliminary hazard analysis, or risk assessment, according to Field Manual 5-19, *Mishap Risk Management*, DA Pam 385-30 and USACE Program Management Best Practices 8016G.

Some designers think that adequate safety is incorporated by life-cycle codes, such as National Fire Protection Association 101, but these do not protect maintenance workers from falls, noise, heat stress and any latent or unrecognized hazards that may be within the design.

For example, the gorgeous atrium at Bassett Army Hospital, Fort Wainwright, Alaska, reaches 90 feet in height. To change lights at that height requires a mechanical lift, but the atrium doorways were not large enough for a mechanical lift to pass through. The design created a safety problem that had to be corrected.

Retrofits are expensive and can be avoided. The best thing designers can do is consider the tasks operations and maintenance staff will have to perform to keep the facility up and running. Providing engineered fall protection anchors, power outlets for confined space ventilation, and sustainable egress and ingress are examples of adding safety to the design.

Cultural change is not easy, and safety integration is even harder. If leaders dictate “lean and green” without respect for employees’ safety, they will find that it does not produce the results they had expected. Leaders who want to do the right thing for the right reasons will dictate “safe, lean and green,” which will improve readiness and mission integrity.

The private sector and the government tend to rely on standards, codes, regulations and other requirements, such as those published by the American National Standards Institute, National Fire Protection Agency, Occupational Health and Safety Administration and American



Changing lights at 90 feet in the air presents a safety challenge that the designers of the atrium at Fort Wainwright’s Bassett Army Hospital did not take into account. Courtesy photo

Society of Mechanical Engineers, but such reliance may not protect from liability. The Federal Tort Claims Act waives sovereign immunity and constitutes the consent of the U.S. government to be sued for the negligent acts of its employees who were acting within the scope of their employment.

According to one personal injury attorney, standards compliance is not a complete defense. Designs are required to be reasonably safe, and the definition of “reasonably safe” varies among jurisdictions. For example, some use a consumer expectation test, while others rely on risk and utility analysis.

Similarly, management that is not heeding its engineers needs to reconect with its staff. Companies and the government can fall out of step with what peers are doing. It is now standard practice to perform facility systems safety reviews and “prevention through design,” as it is known in the private sector, and if regulations and standard practice state that these design reviews are required, then they must be done in practice.

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Acronyms and Abbreviations

DA Pam	Department of the Army Pamphlet
USACE	U.S. Army Corps of Engineers



Quality assurance inspectors, contractors: Fostering relationships

by Matthew Hoffman

The quality assurance-quality control relationship may or may not be well received by the contractor or its quality control staff. Whether or not the contractor has a proven track record of quality performance, the government's quality assurance inspector is there to ensure that the contractor's quality control program is functioning according to contractual obligations.

Quality assurance inspectors cannot control how they are received or perceived by contractors. However, presenting themselves and implementing the quality assurance plan in an unbiased professional manner may positively affect the responsiveness of the contractor's staff and the successful completion of the project.

Simple rules for success

The following advice from a seasoned inspector may help you develop a workable relationship with the contractor.

Admit that you don't know everything. Accept the fact that things change. Take the time to learn what you need for your assigned project.

Don't get too cozy with the contractor or his staff. It's easy to become friendly with a contractor with whom you have been working for an extended period. When the inspector-contractor relationship

has become more than cordial, the relationship could make it difficult for some inspectors to fairly critique or reject part of a project.

Don't direct the contractor unless you have the authority to do so. You may have seen this type of project a thousand times, but, unless your chain of command has given you the authority to act, refer the issue to the person in the chain of command who has the official authority to give direction.

Document everything. In many cases, there is information that might not belong on the type of report you are writing. If you are not sure, find out where and how to report it. The information might be needed later.

Let the contractor see that you are watching and evaluating. People tend to put their best foot forward when they are being watched.

Be professional and polite. Professionalism tends to rub off on people. When people are treated in a professional manner, they usually reciprocate.

Pitfalls to avoid

How do quality assurance representatives avoid being too hard or not hard enough in the course of carrying out their duties? When they follow the specifications to the letter, they are considered overzealous. Not following them closely enough puts inspectors in a precarious position with the engineers or lead inspectors and is not in the recipient of the work's best interest.

Two types of behavior can affect how quality assurance inspectors execute their quality assurance plans:

- being hypercritical or overzealous, i.e., judging the contractor's work too harshly; or

- casting a halo over the work, i.e., overlooking "small" parts of the specifications because you can identify with the contractor's situation.

Contractors recognize and sometimes exploit these behaviors to the detriment of quality control. However, negative effects can be overcome or eliminated by not giving yourself or the contractor latitude that is not in accordance with the plans and specifications. Quality assurance inspectors have leeway in the discharge of their duties only as is written in the specifications and the quality assurance plan, or issued by someone within their chains of command.

Unbiased, professional

The contractor's quality control personnel should be aware of the inspector's adherence to established policy and procedures by his or her professional manner. Nevertheless, a seasoned inspector realizes he or she will meet resistance in the discharge of duties.

The chain of command should be made aware of any difficulties encountered through the reports, which should state fact, not opinion. Regardless of the outcome of difficulties, the inspector must maintain a professional demeanor and remain unbiased to represent the chain of command and assure the quality of the project.

Whether the project is easy or difficult, the success of its quality assurance plan may rest on how the inspector applies knowledge gained by experience and education while fostering a professional relationship with the contractor.

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Quality assurance inspector Matthew Hoffman examines plans at a construction site. Photo courtesy of Matthew Hoffman



Schedule management: key to Army construction management

by T. (Jerry) Shih

All program and project management is subject to three constraints: schedule, cost and scope. Sound project management means completing the project on time (schedule), finishing it within the budget (cost) and meet the project's expectation (scope). Cost is the bottom line, but good schedule management is the key to construction management success.

Schedule management theory

Economics teaches that "time is money." The future value, due to the factor of interest on money, is different from the present value because of the factor of time. Therefore, a well-developed schedule management plan results in better cost control and achieves the construction goal and objective on time.

Henry Gantt developed the "Gantt chart" in the 1910s to coordinate activities and to avoid interferences through a work breakdown schedule. Revolutionary at the time, Gantt charts were successfully employed on the Hoover Dam and are now a commonly used construction management tool. Gantt's contribution to schedule planning also improved construction management by minimizing chances and accidents.

In the 1950s, two mathematical models — the Critical Path Method and the

Program (or Project) Evaluation and Review Technique — were developed for schedule planning. The key element of the former is to predict the time that is required to complete the project. The latter contributes product-oriented categories and work breakdown structure to schedule planning.

Today, all management processes, management system standardizations and management software have schedule management features.

Schedule, schedule, schedule

Meeting the schedule is a key mission for all project team members. Knowing how to start and complete the work is extremely important to the project's success for both the contractor and the owner. Once awarded, the job needs to be completed within an anticipated duration; otherwise, the costs of dedicated equipment and tools, inflation of materials and project administration could eat the contractor's profit and possibly cause the contractor to lose money. The same principle applies to the owner, who would need additional funds to carry the project through.

A well-thought-out schedule management plan that identifies critical paths and provides a means to monitor major progress takes a lot of coordination and justification. The anticipated schedule needs to be emphasized at the pre-award meeting. At the pre-mobilization meeting, the critical paths need to be re-illustrated if delay of the construction award could impact the progress.

It is the project manager's job to follow the construction progress. Short-and-sweet meetings to coordinate field work to meet the critical milestones need to be held periodically. Concentration,

coordination, justification and rectification should take place immediately before the construction progress starts falling behind.

Meeting deadlines

To meet or not to meet the deadline, that is a question in preparing a schedule management plan. In some cases, to meet it is doom, but sometimes failure is not a shame. Quality and safety could be vulnerable if risks are taken to meet the deadline.

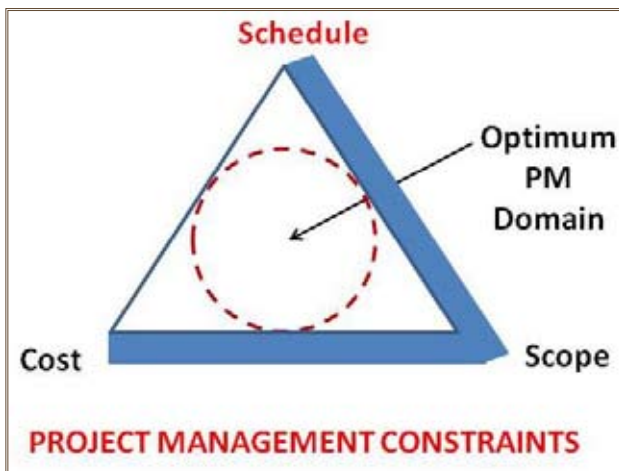
Rebids and requests for more funding could delay the construction schedule. Mother Nature could cause delay as well.

For a project that has fallen behind, the now compressed construction duration requires additional resources due to increased market value of materials and costs of express delivery, special equipment and overtime to meet the deadline, which could increase the owner's cost.

Unless absolutely necessary, quality and safety should not be sacrificed to meet the deadline. If the deadline cannot be extended, risk meetings are essential to go over what-if issues, to analyze all possible worst scenarios that could sacrifice quality and safety and to prepare appropriate plans to respond to consequences.

Good tips

- Avoid delayed delivery of equipment and material. This type of delay is the nightmare that can cause a domino effect on construction progress.
- Consider owner-provided equipment or special material that could accelerate the construction schedule.
- Remember that a schedule that cannot be implemented is not a useful schedule. Meeting the schedule is all team members' commitment. Progress meetings provide the best opportunity to discuss the outlook on meeting the milestones.
- Pay attention to technology improvements when managing a long-duration construction job. Technology, especially means and methods, could provide ➤



Graphic by Suchen Chien, New Orleans District



Fort Bliss energy savings project nearly complete

by Debra Valine

An Energy Savings Performance Contract project started in January 2009 at Fort Bliss, Texas, is nearing completion. As of Dec. 1, the project was 96 percent finished with an expected completion of Jan. 31.

The U.S. Army Engineering and Support Center, Huntsville, the Corps of Engineers' ESPC directory of expertise, partnered with the Fort Bliss Directorate of Public Works and Johnson Controls Inc. on the \$9.5 million project that encompasses 10 different energy conservation measures.

"The project will provide various infrastructure upgrades and energy savings improvements," said Will Irby, the Huntsville Center project manager. "Huntsville Center works with the contractor and the installation DPW, who provides quality assurance and quality control on site."

The projects include upgrades to energy-efficient lighting and lighting occupancy sensors; replacing 61 electric motors; upgrading utility monitoring and control systems; installing thermal wall

insulation, solar thermal systems, a solar cooling and solar domestic hot water system, and a ground-mounted solar photovoltaic system; and replacing a reciprocating chiller and water heating systems.

The annual cost savings from these improvements is expected to be nearly \$1.2 million.

ESPCs provide private-party financing for energy conservation measures at Army installations. The contractor provides capital and expertise to make infrastructure energy improvements on government facilities that significantly reduce Army energy utilization and costs, and the contractor maintains the improvements in exchange for a portion of the generated savings.

"The simple payback on the initial investment is expected to take about eight years," Irby said.

"ESPC helps us fund important energy-savings projects through the saving of energy," said Gene Curtiss, engineering technician with the Fort Bliss DPW's Buildings Operation and Command Center. "Projects that normally might be hard to fund otherwise can be done with this type of contract. This gives Fort Bliss DPW a future path and direction on what works and may not work for our future goals on energy-savings projects. Many of the projects are just starting points on which Fort Bliss can build a much bigger platform in the future as well."

ESPC is a valuable tool available to installation DPWs as they strive to meet federal energy reduction goals of 30 percent energy and 15 percent water reduction by 2015.

"We are seeing dramatic changes in the affected buildings as far as energy



A parabolic hot water array provides preheated domestic hot water for the Stafford Dining Hall at Fort Bliss as part of an ESPC project. By producing and consuming renewable energy on-site, Fort Bliss also receives double credit toward Energy Policy Act 2005 goals. Photo courtesy of Jon Crowell, JCI

usage goes," Curtiss said. "Even with our BRAC [Base Realignment and Closure] expansion, the savings to our energy bill are evident from the projects we have completed.

"The Fort Bliss DPW is very satisfied with the work being achieved through this type of energy savings contract," Curtiss said. "The Corps of Engineers, Huntsville, has been very helpful in giving Fort Bliss DPW the support we need to make this type of contract work smoothly and efficiently. The work done by the energy savings contractor has been well coordinated, and we at Fort Bliss are very happy with the quality of the equipment and the workmanship delivered with this product.

"Huntsville COE [Corps of Engineers] was and is the center of excellence in ESPC; I don't know where else we would go," Curtiss said.

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Acronyms and Abbreviations

DPW	Directorate of Public Works
ESPC	Energy Savings Performance Contract

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out-of-the-box solutions to accelerate the construction progress.

There is no doubt that schedule management is the key to construction management success. The project manager should pay extreme attention to complying with the schedule when managing a construction project.

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Heat is on at arctic air base

by JoAnne Castagna

Within the Arctic Circle, among icebergs and glaciers, inside a fortress at Thule Air Base, Greenland, U.S. Air Force men and women lock their eyes on computer radar screens. They use large, powerful radars to track foreign military rockets and missiles and are able to communicate directly with the White House the moment a threat is detected.

This capability is one of several critical missions being performed daily for America's national security at Thule Air Base. The base is home to hundreds of active-duty U.S. Air Force personnel and American, Danish and Greenlandic civilian contractors.

For decades, under extreme arctic conditions, the U.S. Army Corps of Engineers, New York District, has constructed facilities for the base in support of the Air Force's missions, including aircraft runways, dormitories and medical centers.

Most recently, the Corps improved the base's heating system by replacing outdated and inefficient boilers with energy-efficient exhaust gas boilers that will save the Air Force and taxpayers millions of dollars in fuel costs.

Thule Air Base — "Two Lee," as it is known — is a 254-square-mile base in a coastal valley of Greenland's northwestern corner. The base is the United States' northernmost military installation, and it is nestled between mountains and surrounded by icebergs and glaciers as far as the eye can see.

New energy-efficient heating system

The base's heating system boilers were either no longer operational or operating very inefficiently. Recoverable heat from the system was being lost to the atmosphere, and a considerable amount of fuel was being consumed to make up for this loss. The boilers needed to be replaced and upgraded to make the heating system more energy efficient.

The Corps, at the request of the Air Force, designed the system and is performing the work with Denmark-based contractor GC/MTHøjgaard.

The new system is expected to save \$3 million annually in energy and fuel costs, according to Stella Marco, New York District's project manager.

Before this project began, the base's heating system consisted of three structures that included the "M-Plant," which provided electricity and some steam, and two steam plant facilities that provided steam for heating and hot water. All of these buildings used a considerable amount of fuel to run engines and boilers.

The Corps is removing the old boilers and installing four new exhaust gas boilers in the M-Plant, which will consolidate all steam production under the M-Plant's roof.

To make room, an extension was built onto the M-Plant. The two steam plants will serve as an emergency backup heating source.

This consolidation will save the base about 1.6 million gallons of fuel annually.

Two boilers were installed this past summer, and two more will be installed next summer. The new exhaust gas boilers are connected to the M-Plant's existing five 12-cylinder Cooper-Bessemer diesel engines that drive five large generators, each rated at 3,000 kilowatts. Each diesel runs on jet fuel.

These large engines produce an abundance of exhaust fumes at a temperature of 700-840 F.

"The diesel engines that drive these generators are very much like those found in today's vehicles, only much larger and stationary," said Robert Philbrick, Air Force team leader for New York District.

"They convert fuel oil into mechanical energy to turn the electric generators, instead of turning vehicle wheels," Philbrick said. "The exhaust fumes from these engines are usually released directly to the atmosphere via an exhaust pipe.

"The new boilers the Army Corps is installing are energy efficient and economically feasible, because they're taking these exhaust fumes to create steam that can be used for heating and hot water throughout the base. The old boilers, due to their age and disrepair, wasted the fumes to the atmosphere," added Philbrick.

The exhaust fumes will now be led into the exhaust gas boilers by pipes. An exhaust gas boiler is a large cylinder that is filled with water; tubes or pipes that run from end to end of the cylinder are submerged in the water. The fumes enter the boiler's tubes and heat the water, converting it to steam, which leaves the boiler at about 330 F.

This steam is then piped to all of the base's buildings, where it enters a heat exchanger and creates hot water. The



The generators in the M-Plant deliver power for heating and hot water at Thule Air Base. Photos by JoAnne Castagna



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hot water flows through the building's radiators and heats the rooms.

Arctic construction

Construction in an arctic environment can be challenging. Severe weather and limited daylight require the use of unique building techniques and fast-paced construction.

Construction is limited to May through October, because there is sufficient sunlight, and temperatures are bearable to work in. Temperatures can reach 40 F, and there is 24 hours of sunlight from June through August.

During the remainder of the year, there are severe storms and temperatures can drop as low as minus 30 F. There is also 24 hours of darkness from November through February.

It is also only during the summer that shipments of building materials and fuel can be received. Greenland is locked in by ice nine months of the year, but during the summer, the ice in the shipping lanes can be broken up to allow supply ships into port.

Shipped-in building materials include prefabricated parts that enable workers to perform construction rapidly.

In addition to having a short construction window, workers must deal with permafrost — permanently frozen ground — ranging from 6 to 1,600 feet in depth. Because of permafrost, most structures have to be elevated one meter above the ground, including the M-Plant building extension.

“If buildings are not constructed off of the ground, the heat from the building can melt the permafrost, making the ground unstable and causing buildings to sink,” said Paul Jalowski, New York District’s resident engineer.

Buildings are constructed using spread footings, which go down about 10 feet, and concrete columns that support the floor system above the ground.

In the case of the M-Plant building extension, the building’s flooring was also insulated to prevent heat from the building or its equipment, such as the boilers, from heating the permafrost.

The base’s steam and electrical piping conduits also run above ground for the same reason.


Thule Air Base is now in the throes of its winter storm season. Severe temps can cause frostbite in less than a minute, but the base is benefiting from its more efficient heating system, and



Frigid Thule Air Base sits on Greenland’s Northwest coast. Graphic courtesy of JoAnne Castagna

fuel costs will no longer take as big a bite out of the U.S. Air Force budget.

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New York District Commander Col. John R. Boulé discusses the project with district employees Robert Philbrick and Lucia Gamba in front of one of several newly constructed exhaust gas boilers the Corps built at Thule Air Base.

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INSTALLATION

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202-761-0022

and you may be in our next issue.



At Fort Leonard Wood, Prime Power School completed

by Amy Phillips and Diana McCoy

The Kansas City District of the U.S. Army Corps of Engineers completed a \$30 million state-of-the-art school and handed it over to the 249th Engineer Battalion (Prime Power) during a ribbon-cutting ceremony at Fort Leonard Wood, Mo., Nov. 22. The facility will house the U.S. Army Prime Power School, which moved from Fort Belvoir, Va., under the 2005 Base Realignment and Closure program.

The building is a unique school for a unique unit. The 249th Engineer Battalion is the only prime power production unit in the U.S. Army and the only active-duty unit assigned to the U.S. Army Corps of Engineers. Its Soldiers generate commercial-grade electricity from 600 volts up to 69,000 volts at up to 3.2 megawatts. They provide this electricity to military installations and federal relief organizations during operations ranging from training to disasters to war.

The battalion's Soldiers hold the 12P military occupation specialty — 12 for the engineer branch and P for prime power, and the Prime Power School is the only school that trains this specialty.

The 77,000-square-foot facility replaces a World War II-era warehouse at Fort Belvoir that had been converted for the Prime Power School. The new schoolhouse encompasses administrative offices,

conference rooms, classrooms, instruction laboratories, an auditorium, equipment training areas and outdoor equipment testing areas. The first class of Soldiers began in January.

“Since the Engineer School is already at Fort Leonard Wood, it only makes sense to bring the Prime Power School here,” said Command Sgt. Maj. Micheal Buxbaum, the USACE command sergeant major. “It’s part of the natural progression.”

Mark French, Kansas City District’s project engineer, said he was honored to build for the Corps.

“It’s unusual to build for ourselves,” French said. “We’re proud to turn it over to Fort Leonard Wood and the 249th Engineer Battalion.”

Construction began in February 2009. Kansas City District used the early contractor involvement delivery method due to tight budget constraints. The district has been a champion of the ECI method because it provides flexibility and allows incorporation of lessons learned throughout the duration of the project.

“Initially, we didn’t have the money to fund the project,” said Travis Lynch, one of the district’s resident engineers at Fort Leonard Wood. “Thanks to ECI, we were able to make changes in the design to get the project under budget.”

The contractor, JE Dunn, did an outstanding job performing under tight constrictions and keeping the project on schedule, French said.

The U.S. Green Building Council gave the Prime Power School a Leadership in Energy and Environmental Design Silver

Acronyms and Abbreviations	
ECI	early contractor involvement
LEED	Leadership in Energy and Environmental Design
USACE	U.S. Army Corps of Engineers
USGBC	U.S. Green Building Council

certification. The facility uses a number of high-tech systems to conserve energy. It has highly reflective roofing material that minimizes heat infiltration. Sensors in the rooms detect both motion and natural light, and conserve energy by automatically adjusting the amount of artificial light depending on whether the room is occupied and how much natural light is present. Ninety-two percent of the construction waste was recycled.

Even though the facility is certified LEED Silver, initial feedback from the USGBC indicates that it should be LEED Gold, Lynch said.

“This training facility has set a new standard for environmental stewardship and is on track to be the first certified LEED Gold facility ever built at Fort Leonard Wood,” said Maj. Gen. Merdith “Bo” Temple, deputy commander of USACE.

Maj. Gen. David Quantock, commanding general for the Maneuver Support Center of Excellence and Fort Leonard Wood, officially accepted the new Prime Power School.

“I can’t tell you how excited we are to have this great facility and this great team at Fort Leonard Wood,” Quantock said. “Just a few days ago, we cut the ribbon on one of our star bases, and today, we cut the ribbon of a state-of-the-art prime power facility. It seems like every week the skyline is changing here, and we’re very proud to be part of this rapid change.”

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The new U.S. Army Prime Power School at Fort Leonard Wood, Mo., is ready for Soldier students. Photo by Robert “Brandon” Tobias



Schofield Barracks prepares for major cantonment addition

by Robert Musgrove

U.S. Army Garrison Hawaii is gearing up for the first major enlargement of the Schofield Barracks cantonment in recent history. As a result of the Grow the Army initiative, the existing cantonment area was found to be too small to accommodate the standard design facilities for all required units.

The area known as the South Range, immediately south of the old boundary, was identified as meeting the needs of the Grow the Army force. The roughly 200 acres had been purchased by the Army with the intent of developing additional training lands.

Work to develop the training lands was stalled by issues regarding the environmental impact study. Before the site could be fully developed for training, the Grow the Army initiative presented a more pressing need for the land.

This site had been agricultural lands, used for many generations as pineapple fields. As the pineapple industry diminished and left Hawaii, the lands

immediately surrounding Schofield Barracks became available.

Although the site contains a deep ravine and two small streams, almost 80 percent of the site is relatively flat with an average slope of less than 5 percent. This land provides an excellent opportunity to construct Army standard design tactical equipment maintenance facilities, organization parking, brigade and battalion operating facilities and company operating facilities.

Before any occupied structure can be developed, a new system of roads and utilities must be constructed. The initial phase of development will include construction of a new access road to Schofield Barracks as well as all utility infrastructure needs.

Water, sewer, electrical, data communications and storm drainage requirements to serve all immediate needs as well as anticipated future growth will be provided.

Acronyms and Abbreviations	
BOF	brigade or battalion operating facility
COF	company operating facility
TEMF	tactical equipment maintenance facility
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison

About 30 percent of the site will be developed in this first phase.


USAG Hawaii secured permission from the adjacent landowner to provide temporary access to the public highway. The temporary road will facilitate construction and allow much of the heavy construction vehicles and work to take place without impact to the residents of Schofield Barracks.

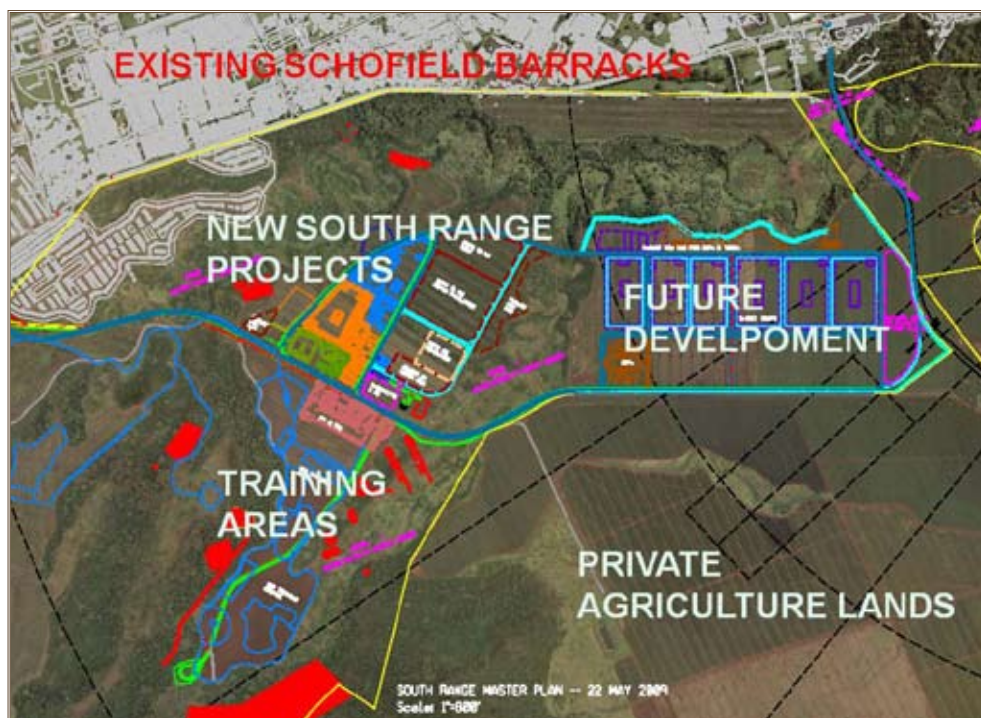
The major hurdles of the first phase include three separate crossings of the streams, a wastewater collection system with a pump station and force main that must connect to the Schofield Wastewater Treatment Center, a million-gallon water storage tank, and coordination and management of construction as the vertical structures are built at the same time as the site and infrastructure utilities are placed.

Upon completion of these projects, several miles of new roads, sidewalks and infrastructure will be installed, as well as two new battalion headquarters, two brigade headquarters, three TEMFs and associated support structures.

USACE hopes to award a single design-build contract for this work soon. USAG Hawaii anticipates occupancy within four years, relieving a major shortage of TEMFs, BOFs and COFs for its Soldiers.

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This plan shows the development of the South Range addition to Schofield Barracks. Graphic by Robert Musgrove



At Joint Base Lewis-McChord, going for gold

by Andrea Takash

Alchemists of old spent lifetimes trying to change lead into gold. Today, the U.S. Army Corps of Engineers transforms buildings into gold in just one year. The buildings, located at Joint Base Lewis-McChord, Wash., will achieve Gold certification under Leadership in Energy and Environmental Design.

The Corps of Engineers, Seattle District, serves as one of the many champions in the Department of Army striving for sustainable solutions in Military Construction projects.

The LEED green building certification program is an internationally recognized system for providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics, including energy savings, water efficiency, carbon dioxide emissions reduction, improved indoor environmental quality and stewardship of resources, according to the U.S. Green Building Council's website.

In July, the Department of Army established a policy that requires all Military Construction projects, starting with fiscal year 2013, to obtain LEED Silver certification. Prior to July, Army projects were required to meet LEED Silver requirements, but only a small percentage were required to pursue actual certification, which adds cost to the project.

Seattle District built two JB Lewis-McCord projects that achieved LEED certification. The fiscal year 2004 barracks earned Silver certification, and a child development center attained Gold.

"Several more projects are on track to achieve LEED certification," said Jeanette Fiess, Seattle District's acting chief, Specifications and Technical Review, and LEED accredited professional. "We recently submitted five Seattle District projects to USGBC for review. It can take three to six months to complete the certification process."

The LEED process starts at the beginning of the design phase with a score card that identifies the building features that the team can count toward LEED certification points. It takes 33 LEED points to achieve a Silver rating and 39 for Gold.

"Most Military Construction projects are design-build, which is performance based," Fiess said. "So typically, the contractor makes the decision on which LEED features to pursue. In the first Military Transformation RFPs [request for proposals] there were only two required credits: 50 percent waste diverted from landfills and 30 percent energy savings required under the Federal Energy Policy Act of 2005. The Military Transformation RFPs have recently been updated to include additional federally mandated sustainability requirements."

Despite the fact that contracts hold no real incentives for going above the minimum requirements, more LEED features are being added to buildings, Fiess said.

"In the Pacific Northwest, it is easy to target LEED Silver because of the sustainable culture, available materials and manageable weather climate," Fiess said. "This area is a good example of what USGBC calls 'market transformation.'"

Medical, dental clinics

The newly opened Nisqually Medical and Fulton Dental clinics are on track to achieve LEED Gold certification.

The clinics feature several sustainable,

Acronyms and Abbreviations	
JB	Joint Base
LEED	Leadership in Energy and Environmental Design
USGBC	U.S. Green Building Council

environmentally friendly features that benefit patients and staff and support JB Lewis-McCord Installation Sustainability Program, said Chuck Cole, project manager for Madigan Army Medical Center's Facilities Management Division.

The team used innovation when it came time to finding LEED features for the clinic. For example, the focus on patient care made indoor air quality important.

"The designer, Korte, got an exemplary point for the ultraviolet germicide eradication system, which prevents mold and kills germs," said Richard Sanchez, Seattle District project engineer and LEED green associate.

Energy efficiency also played a big role in construction — both on the outside and the inside of the building.

"In addition to the white membrane on the roof reflecting heat away from the building, the brick walls absorb heat or cold to stabilize in the middle of the brick, making for a natural temperature control." Sanchez said. "A building's skin that does not lose or gain heat significantly is ▶



The new tactical equipment maintenance facility at JBLM features transpired solar collectors, which contribute to the building's energy efficiency. Photo courtesy of Belay Architecture



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one part of the definition of sustainable.”

Even though the materials provide some natural heating and cooling, the building requires mechanical equipment.

“The clinic’s heat exchanger system is approximately one-third more efficient than a normal system. It is more expensive but very efficient,” Sanchez said.

With an addition to the clinic now under construction, the project team found even more ways to provide sustainable elements.

“The addition includes a solar feature to preheat the water,” Sanchez said. “When the addition is completed in 2011, solar will meet 40 percent of all the hot-water

needs for the 42,094-square-foot clinic.”

Tactical equipment maintenance facility

As a giant service garage, this building type presented unique challenges for the team to obtain LEED credits. But team members overcame obstacles and received 45 LEED points.

“The building site used to be a military training range and was classified as a brownfield,” said Matt Nolan, project manager for Belay Architecture LLC and LEED accredited professional. “The project claimed one point for this feature.”

In addition to efficient land use, this Center of Standardization design uses 41.2 percent less energy than a similar building would.

“On the south-side of the building, we used transpired solar collectors, which preheat the outside air before reaching the ventilation system,” Nolan said. “It allows us to get free heat from the sun.”

The building’s ventilation system provides 100 percent fresh air, making a healthier work environment, said Dave Burch, Seattle District quality assurance representative.

The radiant floor and heat recovery also afford energy efficiency and comfort for the Soldiers. A recent visit from future occupants showcased the importance of this feature.

“The military officers were impressed,” Burch said. “They are currently

using World War II buildings that have marginal heat. Now, they are moving to a building with heated floors.”

The team also diverted 89 percent of the construction debris to a recycle center.

Why include LEED features?

LEED certification costs range from \$2,000 to \$20,000 depending on the square footage of the building. This amount doesn’t include the added costs for more expensive products, such as paint without volatile organic compounds, environmentally friendly flooring products and solar materials, to name a few.

So, why does the Army want to invest in LEED features?

“There are several key benefits to using LEED features,” Fiess said. “The energy and water savings provide a large return on investment. Various products, proper ventilation and natural lighting make for a healthier work environment, which equates to more productive employees. The local economy also benefits from contractors buying local materials.”

Certification update

On the five projects submitted to USGBC, Seattle District received word in December that the Jackson Avenue Barracks project attained LEED Silver, and the tactical equipment maintenance facility achieved LEED Gold.

Projects pending certification are the Fiscal Year 2008 Railroad Upgrade, which is tracking to Silver; the Nisqually Medical and Fulton Dental clinics, tracking to Gold; and the Fiscal Year 2008 Indoor Baffle Range, tracking to Silver.

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The Nisqually Medical and Fulton Dental clinics’ grounds at JBLM contain four rain gardens, which control water pollution on the site. Photo by Andrea Takash



At Natick, master planners energize net-zero future

by Benjamin M. Skinner

A team of master planners at the U.S. Army Corps of Engineers' Savannah District completed a unique assignment related to energy production. The project, located at U.S. Army Garrison Natick, Mass., called for converting an existing central energy plant to a modern trigeneration plant, saving the installation millions of dollars in energy cost each year.

Environmental benefits

From one energy source, a trigeneration plant can produce three forms of energy — hot water, chilled water for air conditioning and electrical power. It can produce an up-to-50-percent more efficient system than cogeneration.

Although trigeneration does not fall into the renewable energy category, it does have many environmental benefits:

- 15 percent reduction in nitrogen oxide,
- 35 percent reduction in fuel consumption,
- 45 percent reduction in carbon dioxide, and
- 100 percent reduction in sulfur dioxide.

The USAG Natick trigeneration plant will use a loop distribution system of piping throughout the installation for heating and cooling buildings. The system will consist of warm and chilled water lines, which are much more efficient than hot-water or steam lines. Also, the electricity produced from the new plant will be able to cover the baseline electrical consumption for the entire installation.

The Savannah District master planning team completed a planning charrette to determine the facility requirements, prepared programming documents for construction funding and created an economic analysis.

The team had to draw from their unique skill sets to develop a comprehensive economic analysis. Due to the advanced capabilities of the trigeneration plant, the team was able to compare previous billing cycles from the installation against

anticipated energy savings and determine that the project should be able to pay for itself in fewer than 10 years of energy cost savings alone.

Army goals

With this project, the Savannah District is helping USAG Natick's Soldier System Center lead the charge toward the Army's goal for net-zero infrastructures on all installations by 2030. In this case, "net-zero" means that the installation creates as much energy as it uses.

This project is required for USAG Natick to meet the goals of the Energy Independence and Security Act of 2007 and Executive Order 13423. Both mandate that federal facilities reduce energy consumption by 30 percent by fiscal year 2015. These measures further require that fossil fuel energy consumption be reduced in federal buildings by 65 percent by FY 2015 and by 100 percent by FY 2030.

By drastically cutting its energy consumption, the installation saves money, helps the environment and sets an outstanding precedent for other installations to follow.

Specialized services

The trigeneration project is just one example of the planning services provided by the Savannah District, which has one of the few in-house military master planning teams in USACE. Savannah District's master planning team recently helped Fort Gordon, Ga., and Fort Benning, Ga., get started on their net-zero initiatives by completing geothermal ground source heat transfer system charrettes.

The team specializes in a wide array of planning services in its geographic area and also at other installations inside and outside the continental United States. Project locations outside its region range from Washington, D.C., to California and from Afghanistan to South Korea.

The team is made up of a diverse group of individuals, each with his or her own set

Acronyms and Abbreviations

FY	fiscal year
GIS	geographic information system
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison



Ben Skinner (left), Will Spence (center) and Tyrone Williams (right), Savannah District master planners, review plans in preparation for a charrette for a trigeneration power plant at USAG Natick, Mass. Photo by George Jumara

of unique skills enabling the team to meet the needs of Savannah District's military customers, said Charlie McGee, chief of Master Planning.

These services encompass:

- installation status reports,
- space utilization studies,
- special facilities,
- infrastructure or engineering studies,
- privatization studies,
- area development plans,
- historic structure studies,
- force protection studies,
- project site planning and alternative siting analysis,
- integrated facilities systems,
- assigned stationing and installation plans,
- Real Property Planning and Analysis System,
- Facilities Planning System,
- real property master planning, and
- construction programming support.

Making projects a reality

The team specializes in DD Form 1391 development. This process



At Military Ocean Terminal, Concord, applying subsurface utility engineering techniques

by Mike Haskell and Thomas X. Sobolewski

This nation's military facilities have been burying utilities for more than 100 years. All military branches are making additions and altering utilities daily to keep up with the demand at each facility. Military Ocean Terminal, Concord, Calif., is no different. MOTCO's utility systems not only serve the facility, their location is critical to future construction projects.

Last March, the U. S. Army Corps of Engineers, Sacramento District, was given the mission of locating three main utility systems within MOTCO's boundary. The task was to accurately, within a certain degree, map the existing water, storm-drain and wastewater systems.

For the job, Sacramento District used the *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data* of the American Society of Civil Engineers. The district employed the Subsurface Utility Engineering process.

SUE combines traditional engineering practices, such as record research, utility

design and relocation design, and plotting of utilities from records. It has four quality levels:

Quality Level D:

- Research records and information
- Collect records
- Review records
- Include aerial or ground-mounted facilities
- Compile and presentation data

Quality Level C:

- Include Level D quality assurance and control tasks
- Identify surface utility features
- Include aerial or ground-mounted facilities
- Survey facilities
- Correlate, interpret and present data
- Resolve discrepancies

Quality Level B:

- Include Level C QA/QC tasks
- Detect and mark lines
- Perform field surveys

Acronyms and Abbreviations	
ASCE	American Society of Civil Engineers
EM	electromagnetic induction
GIS	geographic information system
MOTCO	Military Ocean Terminal, Concord
QA/QC	quality assurance and quality control
SDSFIE	Spatial Data Standards for Facilities, Infrastructure and Environment
SUE	Subsurface Utility Engineering process
USACE	U.S. Army Corps of Engineers

- Correlate, interpret and present data
- Resolve discrepancies

Quality Level A:

- Include Level B QA/QC tasks
- Select test locations
- Select method
- Comply with ASCE requirements
- Excavate test holes

At MOTCO, the first phase was to perform Quality Level D and C surveys on the water, storm and wastewater systems. Level D data were derived from existing records, such as as-built or as-designed drawings and maintenance logs, along with

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consists of an intense three- to five-day planning charrette workshop, led by the in-house team of specialists and aimed at creating a clear vision of the project needs. Through a comprehensive yet streamlined process of interviews with the users, the Directorate of Public Works, the force protection representative and numerous other players, the team determines all requirements necessary to make the project a reality.

"Here in the district, we work alongside the cost engineers, which enables us to have the most up-to-date cost information possible right at our fingertips," said McGee. "We also have a close working relationship with the Savannah District Center of Standardizations. This gives us a working knowledge of the role the

Center of Standardizations plays in your project to ensure that all standards are met."


As green energy and sustainable design use grow in importance, the team adapts products to comply with the Army's sustainable design policy and implementation requirements. The team also ensures all of its projects meet Leadership in Energy and Environmental Design Silver qualifications. Deliverables for the planning charrette include the completed DD Form 1391, site plan, project definition rating index, project résumé and charrette minutes.

"We also are your go-to team for staying on top of the ever-changing world of technology," said Scott Gobin, geographic information system coordinator.

Savannah District can help installations with their mapping needs through its in-house GIS team and its indefinite-delivery, indefinite-quantity contracts. It also provides enterprise GIS development, field surveys and map updates.

"Whether it's the trigeneration plant at USAG Natick, a barracks complex at a nearby installation or planning and scoping of facilities to support the Afghanistan National Police, we stand ready to give our Soldiers and Civilians what they need to carry out their missions," McGee said.

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(continued from previous page)

the maintenance crew's recollections. The county and city public works agencies were contacted, however both agencies had little to no information that was useful for this mission.

To perform Quality Level C work, field survey crews used a handheld GPS with subfoot accuracy capabilities to capture all visible features like manholes, storm drains,



A survey crew member uses a handheld GPS device to record a feature. Photos by Mike Haskell



Drains and culverts are visible features that aid survey crews.

lift and pump stations, cleanouts, culverts, storage basins, hydrants and water valves.

Visible attribute information for each feature was also captured in the GPS in a custom data dictionary set up prior to the field survey. Once the feature was captured, it was marked with temporary construction chalk so that it would not be captured twice.

At the end of the day, data collected was downloaded and transferred to the Sacramento District office where it was stored and analyzed.

Level C does not address utilities for which there is no visible above ground features, so if there are no records to show utilities in an area, research will not be done in that area. At MOTCO, records dating back to the late 1940s were comprehensively searched, but the team still advised MOTCO to use caution when employing Level C data.

Next, missing data and areas of concern were mapped out and revisited in the field. After many field checks, review of previous records and meetings with maintenance crews, the data was put into a geodatabase compliant with Spatial Data Standards for Facilities, Infrastructure and Environment.

Phase two consisted of Quality Level B work to map with greater accuracy MOTCO's main waterlines and detect any

leaks along those lines. Due to the sensitive nature of the area, Quality Level A, which is the most accurate method, was not feasible.

A contractor with experience in SUE methods was brought in to perform the work. Due to budget constraints, the entire facility could

be not be completed, so a project area was determined.

In mid-November, the contractor performed the field location survey and leak detection along the waterline using electromagnetic induction, also called terrain conductivity. EM was the most cost-effective technique available for this phase.


The EM method was used to detect and locate both metal objects and zones of conductive contamination. It is the only widely available geophysical technique that is sensitive to the presence of both ferrous and nonferrous metal objects.

Ground penetrating radar was also used and operates like more familiar radar systems, such as police or weather radar. A radio frequency signal is transmitted into the earth and reflected back from interfaces in the path of the signal at which changes in the electrical properties of the subsurface materials occur. Ground penetrating radar provides a continuous profile of the subsurface and is commonly used in conjunction with EM techniques.

Using these methods, the waterlines within the project area were located, and it was determined that there were no leaks along those lines. Data was provided in a SDSFIE-compliant database and was submitted to USACE for review.

The accurate SUE information that MOTOC now has will allow designers to make early revisions that can eliminate many utility conflicts in their designs. Reducing the number of utility conflicts will help lower project costs and increase project safety.

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Fort Hunter Liggett plans for a revived installation

by Cyndi Skinner and Mark Gillem

Until very recently, Fort Hunter Liggett, Calif., was a planning blank slate. With very few buildings and minimal existing infrastructure, the post's master plan was a mere adjunct to Fort Ord's document.

Fort Hunter Liggett, an Installation Management Command installation with a Reserve mission, supports training for all services on its extensive ranges and training areas. Until 2005, it had been considered for closure. Since then, the installation has gained importance as a Korea- and Afghanistan-like training ground. Support facilities and the attendant staffing were urgently needed. The first position identified as a requirement for moving forward was chief of Master Planning.

Earlier planning efforts were sufficient for the times, but when the training mission ramped up, inordinate pressure was placed on the few existing facilities and amenities. The earlier documents had proposed some training-related construction, but these facilities were limited in size and function and never came to fruition.

To provide basic offices and classrooms for arriving tenant commands, several temporary facilities were constructed. As is typical in a planning vacuum, this new construction was placed wherever it was deemed convenient with little regard

to its relation to other structures, functionality or available utilities.

A comprehensive master plan was clearly needed.

Most work at the installation is funded by the Reserves. This situation, along with quickly shrinking budgets, made funding a full master plan a difficult sell. Fort Hunter Liggett's operating budget goes to fixing aging infrastructure, so the approach was to identify essential document elements as a starting point for funding and hope for the best in the future.

Fortunately, this effort has the ear and understanding of the installation commander. Unfunded requirements were ready to execute, and when enough year-end funding became available to cover the initial work, the master planning process was off and running.

The master planning project, sponsored by Headquarters, U.S. Army Corps of Engineers, is focused on training installation personnel in master planning. Participants in the workshops write the planning vision, develop design principles, analyze the site, prepare plan alternatives and detail a preferred alternative. The effort is hands-on and highly engaging.

The first workshops were such a success that finding money for the remaining pieces was less challenging. Participants saw the value that planning brought, and when budget is discussed, funding planning is often one of the first issues addressed.

Planning, by its nature, engages people from various backgrounds and disciplines. When people know their input is valued, ownership follows. The Fort Hunter Liggett model is no different; the plan that is currently



Development of Fort Hunter Liggett's Black Hills area is shown in this rendering. Graphic by The Urban Collaborative, LLC

being developed belongs to those who participated in the workshops, not just the Master Planning Division. And woe to those who attempt something contrary to the plan.

While not yet completed, the plan already provides construction guidance for future development. Several training support facilities have been placed within a previously undeveloped area using the planning document as a guide. In the long term, the framework plan and form-based code adopted in the plan will provide continuing direction for effectively and efficiently developing the remaining real estate so that it is compact and more easily accessible.

Compactness increases capacity and decreases costs, rare commodities on most installations. That expanded capacity assists in better managing and controlling future development. At Fort Hunter Liggett, the planning team identified room for 2.2 million square feet of development within the cantonment area.

The Army is placing increased emphasis on energy efficiency, and master planning plays a key role in assisting installations to meet energy goals. Fort Hunter Liggett's compact development will allow for easy walks to a variety of destinations and reduce utility connections to facilities that are no longer widely dispersed. Buildings will be oriented to maximize or minimize heat from the sun or shade from nearby trees and landscaping. Emerging



Fort Hunter Liggett personnel discuss the post's future at a planning workshop. Photo by Mark Gillem



Hawaii's privatization initiatives come full circle

by Ann M. Choo Wharton

From Helemano Military Reservation, Hawaii, on the plains above Oahu's famed North Shore, to Fort Shafter, headquarters for the U.S. Army Pacific Command, in the heart of Honolulu, Island Palm Communities has provided thousands of new and renovated homes, dozens of tot lots and parks, and dozens of community centers and recreational amenities for more than 7,000 military Families who call Hawaii home.

To date, 3,294 new homes have been constructed, and 1,055 homes have been renovated. And, more are on the way. A lot more.

It has been six years since the Army entered into a partnership with developer Actus Lend Lease to form one of the largest Military Housing Privatization Initiatives: Island Palm Communities.

Reflecting on the condition of Army Family housing in 2004 and the challenges

experienced by the partnership during the transition to privatization, it is gratifying to see how much this public-private venture has accomplished.

The shared vision to do what is right for Soldiers and their Families has brought together leadership from the Army, Actus Lend Lease and the local Residential Communities Initiative team to successfully deliver on their promise to Soldiers.

"When I drive through a community and see Families strolling through neighborhoods and friends gathering at a community center or under a gazebo in one of our parks, that's when our achievements really hit home," said Col. Douglas Mulbury, commander, U.S. Army Garrison Hawaii. "We set out to provide Families with a community they would be proud to be part of, a place where they can find a network of friends and services to meet their needs, and a place they want to call home, even if just for a few years.

"I look around, and there is no doubt we are well on our way to accomplishing what we set out to do," he added.

Mulbury, who assumed command last summer, has provided valuable leadership to help ensure the momentum generated by the partnership is sustained. Just more than half the \$2.5 billion initial development

Acronyms and Abbreviations

IPC	Island Palm Communities
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scope is complete, which means there is still a sizeable amount of work to be done.

"We have hundreds of trades on our construction sites each day helping us deliver on our promise to Families," said Mark Frey, IPC deputy project director. "In 2011, we'll build 411 new homes and renovate 324 historic homes. At year's end, nearly 70 percent of our planned 5,388 new homes and 55 percent of 2,515 historic renovations will be complete."

In addition to homes, the sixth of eight planned community centers will be completed in early 2011.

Located at Wheeler Army Airfield, the Wheeler Community Center will be the second facility to feature a swimming pool. It will also feature a tot lot, a fitness center, a movie theater and a large multipurpose room with a complete kitchen facility.

As with all the community centers, property management staff will provide a full range of property and community services to the 600-plus families living in the Wheeler community.

IPC will wrap-up construction and renovation in 2015. At end-state, it will have 7,894 homes.

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Possibly one of the most sustainable neighborhoods built on an Army installation, Fort Shafter's Simpson Wisser neighborhood is part of the U.S. Green Building Council's Leadership in Energy and Environmental Design for Neighborhood Development pilot, which will help establish the first national green ratings for neighborhood development. Photo by Mark Brown, IPC

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energy- and water-saving technologies that use rooftops, car parks, exterior walls and water catchment systems will be used.

Planners at Fort Hunter Liggett have learned that empowering installation staff members makes them part of the planning

team. This collaborative approach is essential in a process as complicated as master planning. Together, installation staff can create plans that meet today's needs and leave room for tomorrow's unknown missions.

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At Fort Hood, Corps rehabilitates joint-use runway

by Ron Harris

In 2009, representatives from the City of Killeen, Texas, the Federal Aviation Administration and Fort Hood, Texas, met to discuss plans to repair or replace the joint-use runway at Fort Hood's Robert Gray Army Airfield. The joint-use runway is one of only a few that are shared and operated by civilian and military entities.

Due to increased use by both civilian and military components, the runway had begun to show wear and was in need of repair and rehabilitation. Fortunately, the damage was not in the foundation or subdrata but was limited to the wearing course.

Officials were told that this type of runway rehabilitation had been done only once before in the United States, so there was not much experience on which to draw.

The highest priority was placed on having an active runway during daily business hours. To continue daily training and flight operations, a plan was designed to perform all work between midnight and 6 a.m. This requirement was backed by a \$1,000 a minute fine for delayed opening of the runway each day.

Jacobs Engineering designed the project and incorporated Corps of Engineers' airfield requirements for the asphalt mix design and paving processes. The Corps' Omaha District Transportation Center of Expertise provided the specific airfield requirements for design and construction parameters.

Prior to commencing work, Fort Hood Corps representatives hosted a paving workshop to discuss all features of the work, from aggregate quality and design criteria to performance requirements during paving operations.

Once work began, construction paving and daily materials testing and inspections were performed by personnel from both Jacobs and PaveTex Engineering and Testing. All quality assurance inspections of paving operations, mix design and daily

test results review were performed by personnel from the Corps' Central Texas Area Office, at the request of the Fort Hood Directorate of Public Works and the airfield operations manager.

The scope of work for the 9,200-linear-foot runway included removing the top two inches of existing surface course and replacing with a high-stability wearing course designed to sustain the anticipated military and civilian traffic. In addition, the project included all necessary temporary and final runway painting and grooving to allow for rapid water removal.

A critical consideration during the planning phase was to ensure that all foreign debris was removed prior to opening the runway. This requirement proved to be a real challenge due to the excess debris created by milling and hauling operations.

The additional effort required to maintain a debris-free environment and the punitive penalties related to maintaining daily operations extended the planned three-week paving project to about seven weeks.

Despite the challenges, Big Creek Construction from Lometa, Texas, completed the task and handed over to the customers a high-quality pavement. The project was turned over with no deficiencies.

This high-profile American Recovery and Reinvestment Act project was a



Workers measure depth after milling operations during rehabilitation of the joint-use runway at Fort Hood. Photos by Patrick Spilman, Central Texas Area Office




Runway paving is done at night, so that flight operations can continue during the day.

complete success and serves as an excellent example of what can happen when civilian and military components work together toward a common goal. During project construction, several contractors and engineering firms called the offices of the involved organizations seeking information and ideas for similar joint-use runway projects.

The project is as a model for those desiring to keep airfield operations open while achieving a quality finished project.

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Using PEX piping in renovation projects

by Louis B. Bartels and Nadia Abou-El-Seoud

Army installations are continually faced with the restoration of aging metallic piping systems. Considering the rising price of copper and the difficulty of refitting a building with a new copper system, using a PEX — cross-linked polyethylene — piping system may offer numerous benefits.

Although PEX is most common in residential applications, its use in larger applications where pipe diameters are less than two inches is being investigated. PEX piping boasts lower installation and material costs compared to copper. In addition, the ease of installation and potential longer service life of PEX provide further benefits.

During fiscal year 2010, under the Army's Installation Technology Transition Program, a PEX demonstration project was conducted at Fort Campbell, Ky. The Construction Engineering Research Laboratory and the fort's Directorate of Public Works compared and analyzed PEX and copper domestic piping.

The project involved two nearly identical vintage 1954 hammerhead-style barracks. One barrack was refitted with a traditional rigid metallic copper plumbing system, and the other was fitted with a PEX plumbing system. The goal was to analyze the potential benefits of using PEX in building renovations. The demonstration proved PEX to be advantageous in cost, labor and materials when compared to the rigid metallic piping most commonly used in building renovations.

Overall savings

Daily data was collected for each building documenting labor hours by laborer type, equipment required, detailed

Piping System	Labor Cost	Equipment Cost	Material Cost	Grand Total Direct Cost
Copper	\$34,719.75	\$4,828.46	\$8,865.26	\$48,413.47
PEX	\$30,082.25	\$3,686.24	\$5,645.20	\$39,413.69

Comparison of PEX and copper pipe refits at two similar Fort Campbell barracks shows a cost savings of nearly \$9,000 from using PEX piping. Chart courtesy of the Office of the Assistant Chief of Staff for Installation Management

material quantities and associated costs. The daily log demonstrated that the PEX refit had a direct cost savings of nearly \$9,000 over the copper refit.

Labor – Labor data was recorded by building, date, labor type and rate. Because the installation of copper piping requires more time due to soldering and the inability to bend or flex around objects, it is much more labor intensive. The PEX project required 78 fewer plumber labor hours than the copper project, equating to a labor savings of \$4,637.

Equipment – Equipment data was logged by description, quantity, unit of measure, unit cost, and building or plumbing system. There is not a lot of specialized equipment needed for copper or PEX piping. However, an equipment savings of \$1,142 was found in PEX's favor.

Materials – Materials were documented by description, quantity, unit cost, and building or plumbing system. PEX piping of less than three-fourths inch diameter had a substantial material cost savings over the copper. This lower cost is probably because PEX is readily available in smaller sizes for residential applications. The larger diameter PEX pipe, especially the two-inch pipe, was not significantly cheaper than copper due to the scarcity of those sizes. The direct cost savings of PEX materials was \$3,220.06 over the copper plumbing materials.

Limitations

Although there are noticeable cost advantages with PEX, some limitations should be considered. PEX is available only in sizes up to two inches in diameter. The barracks used in the PEX implementation

project had existing piping up to three inches in diameter prior to the renovation. To maintain a controlled comparison between copper and PEX, piping larger than two inches in diameter was not included in this study.

Acronyms and Abbreviations

DPW	Directorate of Public Works
ITTP	Installation Technology Transition Program
PEX	cross-linked polyethylene

During the project, it was also noted that the larger diameter sizes of PEX piping and fittings were difficult to acquire. Larger sizes had to be purchased from a variety of manufacturers, which caused delivery delays.



PEX piping is installed in conjunction with copper piping at Fort Campbell. Photo by Louis Bartels

Fortunately, PEX and copper can easily be used together. If larger diameter piping is required, copper can be used as a supplement to a PEX renovation project.

Using PEX

The Fort Campbell DPW plumbing shop has been using PEX pipe and fittings for spot repairs since 2009. Plumbing shop personnel report that using PEX on conventional repairs saves an estimated one-third to one-fourth on labor hours as compared to a repair done with copper. Factors such as location of the damaged pipe and type of materials the shop has on hand determine if PEX is used as a spot repair mechanism for a specific work order.

Using a PEX plumbing system in a renovation proved to be beneficial during the Fort Campbell refit project. Its limitations may have an effect on the project scope, but PEX may be a sound choice for piping refit in renovations.

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Potential effects of climate change at Army installations

by Matthew Hiett, Robert Lozar and James Westervelt

The Department of Defense is concerned that climate change could affect military operations and installation missions. To help determine when, where or if important changes may occur, the U.S. Army Corps of Engineers' Engineer Research and Development Center has begun to survey likely effects on continental U.S. Army installations.

The results of the USACE survey focus on projected changes in temperature, precipitation, ecosystem shift, erosion potential, and impacts on managing invasive species and threatened and endangered species.

The goal is to inform Army land managers and planning personnel about the potential changes in land-use management and planning that may occur at their installations due to climate change. Results of the erosion portion are summarized below.

The study concluded that Army land managers will likely face both climate and ecosystem shifts along with exacerbated problems in managing threatened, endangered and invasive species. As a result of these potential changes, the Army and DoD may be required to develop new land management techniques, procedures, standards and regulations to deal with this shift.

Erosion potential

Global climate change will likely lead to fluctuations in both annual precipitation and intensity. Studies of precipitation patterns from the 20th century consistently reaffirm reports from the Intergovernmental Panel on Climate Change, the leading international body for the assessment of climate change, of increasingly variable precipitation with a bias toward more extreme precipitation events.

The bulk of research suggests that, as the global climate changes in this century, precipitation regimes will become increasingly extreme, leading to longer periods of drought accompanied by an increase in the percentage of precipitation in the form of intense rainfall events.

The erosion portion of the USACE study focuses on three primary driving factors: slope, soil erodibility and projected precipitation intensity due to climate change. Slope and soil data represent current conditions at installations, and precipitation intensity change represents the projected impact of global climate change on CONUS rainfall patterns.

The map shows the sum of the three input factors and represents the projected risk of erosion across the country at the end of the 21st century, i.e., 2080-99.

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
CONUS	continental United States
DoD	Department of Defense
ERDC	Engineer Research and Development Center
USACE	U.S. Army Corps of Engineers

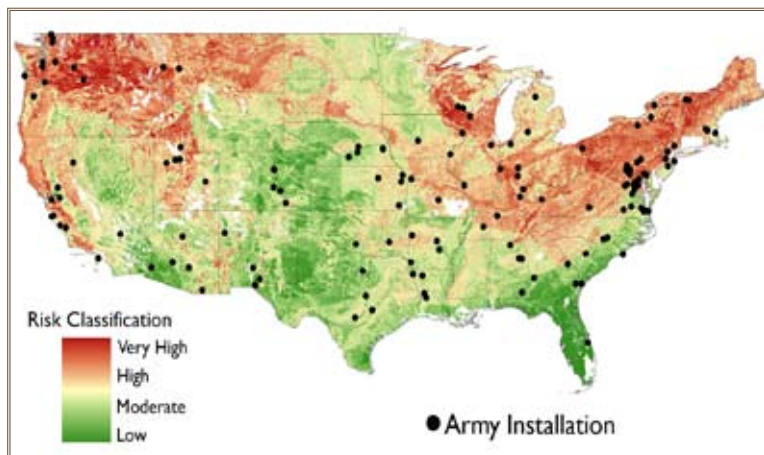
Installations at risk

For CONUS installations, there are two noticeable clusters of very high risk Army installations — the Northeast and the Northwest. Of those Army installations deemed “key” due to their considerable size and importance to the mission, 10 are located in areas of “very high” or “high” risk for erosion.

The erosion risk analysis provides a rank-order of Army installations that affords a better understanding of one problem intensified by climate change by the end of this century. The most useful way to apply this erosion analysis is to use the relative risks among installations to better target specific sites for detailed study that will provide more concrete answers regarding future erosion risk.

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This map shows the projected combined effects of three factors used to predict erosion potential at CONUS installations. Graphics courtesy of ERDC-CERL

Key Installations with High or Very High Risk of Erosion

Aberdeen Proving Grounds Military Reservation, Md.	Very High	Erosion Potential
Fort Knox, Ky.		
Yakima Firing Center, Wash.		
Camp Atterbury Military Reservation, Ind.	High	Erosion Potential
Camp Riley Military Reservation, Ore.		
Fort Campbell, Ky.		
Fort Dix Military Reservation, N.J.		
Fort Drum, N.Y.		
Fort Leonard Wood Military Reservation, Mo.		
Fort Polk Military Reservation (Pelham Range), La.		



Inside the barracks requirements black box

by Zeli R. King

Programming for barracks begins with accurate requirements. Determining accurate requirements begins with installations. Those are simple statements, but they encompass a complex process.

History

With the 1994 Government Management Reform Act, the Army created a systematic program to validate barracks requirements or construct new barracks to meet requirements. The Barracks Modernization Program focused on construction and modernization of existing facilities to eliminate common area latrines and crowded sleeping quarters.

A bigger step was taken in 2005 when Office of the Assistant Chief of Staff for Installation Management leadership asked the director of the Army staff for funding to repair life, health and safety deficiencies in permanent party barracks. OACSIM requested a comprehensive barracks plan, not a temporary fix. A plan, developed under the Recruiting and Retaining an All Volunteer Force banner, identified an acceptable living standard, determined how the other services were addressing the issue, developed and estimated the cost of

potential solutions, identified a timeline for executing solutions and addressed the unaccompanied personnel housing privatization study solutions.

OACSIM convened a team of experts from the Army staff and secretariat, the surgeon general's Office of Preventive Medicine and the Office of the Under Secretary of Defense for Acquisitions, Technology and Logistics, to develop a holistic barracks program strategy.

Strategy

In January 2005, the secretary of the Army approved the Holistic Barracks Strategy, which remains the focal point for the barracks program. The approval ensures adequate living conditions for single Soldiers by adopting short-, mid- and long-term solutions:

- Provide a common living standard.
- Validate and repair life, health and safety deficiencies.
- Move single staff sergeants Armywide off-post in the United States.
- Focus funding on annual barracks sustainment.

Acronyms and Abbreviations	
ASIP	Army Stationing and Installation Plan
BRAC	Base Realignment and Closure
HQRPLANS	Headquarters Real Property Planning and Analysis System
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management
POM	Program Objective Memorandum
UPH	unaccompanied personnel housing

- Learn from the Navy's barracks privatization efforts.
- Continue the Barracks Modernization Program.
- Execute the Centralized Barracks Management Program.

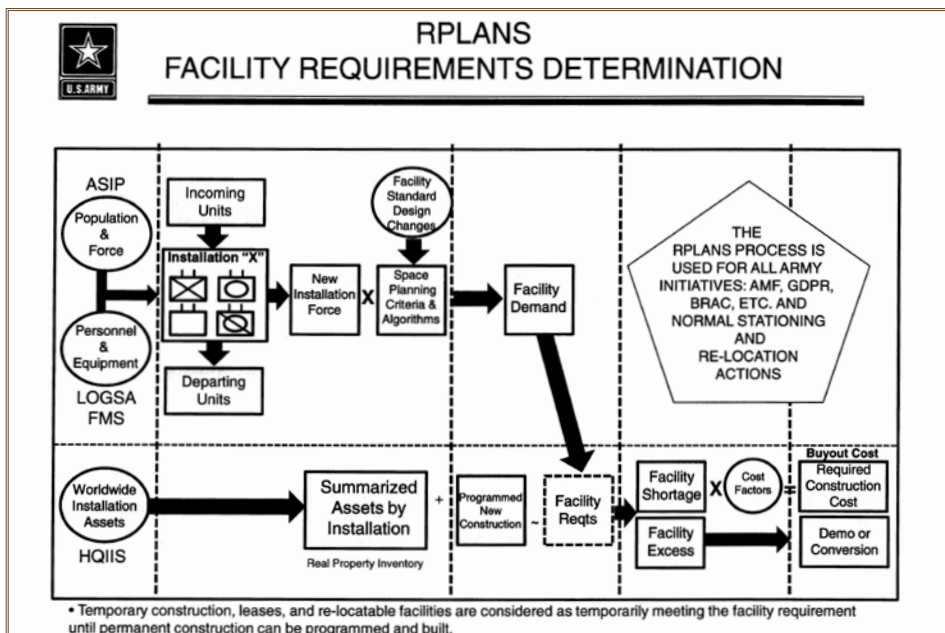
The Army's emphasis on UPH as a quality-of-life issue that affects readiness and retention is the driving force for a continual barracks investment strategy. Since 1994, the Barracks Modernization Program investment strategy has been delayed by Army Transformation, Base Realignment and Closure and Grow the Army initiatives. However, the Army continues its commitment to and investment in providing Soldiers with the same quality of housing that could be found off post.

Methodology, requirements

To ensure a successful investment strategy and obtain adequate funding, OACSIM must provide the Army leadership with validated requirements.

Initially, the Army programmed barracks for 100 percent of single Soldiers in the ranks of private through sergeant and 50 percent of staff sergeants while subtracting the actual number of Soldiers in those ranks adequately housed off post based on 1997 Basic Allowance for Housing data. This methodology was commonly accepted by the Installations Program Evaluation Group before Program Objective Memorandum 2007-12.

Through the Holistic Barracks Strategy, staff sergeants were authorized to reside off post. That alteration, along with



Graphic by Carl Robinson, OACSIM



Technology opportunities for installations

by Phil R. Columbus and Kelly M. Dilks

In the first quarter of fiscal year 2011, the Army Technology Standards Group met in San Antonio with the new chief of the Installation Management Command's Public Works Division, Gregg Chislett. During this meeting, Chislett learned of the opportunities for installation involvement in testing and evaluating technologies for a more sustainable infrastructure.

As a result, Brig. Gen. James Boozer, director of Operations for the Office of the Assistant Chief of Staff for Installation Management, and Chislett invite the installation community to participate at an enhanced level in the Installation Technology Transition Program and the TSG's technology evaluations.

The ITTP is a multi-million dollar program funded each year by OACSIM to demonstrate technologies on Army installations. Sustainment management systems, a thermo-composite plastic bridge and add-mixtures for curing concrete at

low temperatures are just a few of the topics in previous *Public Works Digest* articles that resulted from ITTP funding.

The TSG also evaluates technologies to determine their feasibility for Army installation use. Some of these evaluations result in an Army technology standard. Others do not meet the technology standards criteria yet have great potential for supporting sustainability.

Some examples of recent evaluations are daylighting, photoluminescent exit signs, cool roofs and synthetic turf. These evaluations are posted on the Army TSG website within Army Knowledge Online.

To participate in either testing a technology at your installation or having the TSG evaluate a technology, visit the Army TSG website within AKO. You must request access to the site; all Army federal employees are approved automatically. With access, you can see all past and current ITTP projects, request a technology evaluation or look

Acronyms and Abbreviations	
AKO	Army Knowledge Online
ITTP	Installation Technology Transition Program
OACSIM	Office of the Assistant Chief of Staff for Installation Management
TSG	Technology Standards Group

at evaluations done on behalf of another installation.

If you do not have access to AKO, e-mail philip.r.columbus@us.army.mil or kelly.m.dilks@us.army.mil. Provide your name, location, issue or technology of interest and whether your installation is interested in participating in a demonstration of the technology.

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massive restationing decisions, made the 1997 survey obsolete and prompted changes to this methodology.

The requirements were changed to encompass 95 percent of single Soldiers in the ranks of private through sergeant as reported by the Headquarters Real Property Planning and Analysis System. HQRPLANS was used as a sole source for barracks requirements until POM 2008-13, when the Grow the Army, BRAC and Army Transformation initiatives caused rapid and continuous changes to the Army structure, making it difficult for HQRPLANS to keep pace and produce accurate programming data.

Today, barracks requirements are calculated using a combination of the Army Stationing and Installation Plan, the single data source of Army population projection, HQRPLANS and facilities data management systems. OACSIM also works closely with Installation

Management Command master planners to achieve uniformity of requirements determination across the Army.

What you can do

The installations play a big part in requirements determination. Their input into the Integrated Facilities Systems, the Planning Resource for Infrastructure Development and Evaluation, the General Fund Enterprise Business System and the Installation Status Report feeds the Headquarters Installation Information System data repository. The installations also update and validate ASIP and HQRPLANS data for joint basing where the other service's data is not included.

The data must be auditable in order to validate the requirements. If you perceive a shortfall at your installation but nothing is being done to address it, you can make the requirement visible to Headquarters, Department of the Army, by validating or correcting data in the systems, verifying

that conversions or diversions are not affecting the availability of facilities and coordinating with regions and Headquarters, IMCOM, to verify deficits.

Accuracy is important

Senior Army Leadership supports a holistic approach for both programming and execution of the permanent party barracks program, and this comprehensive program is the basis for determining requirements to house the force today and in the future.

Installations play a key role in ensuring adequate facilities are available to single Soldiers. As critical members of the Army team, all are required to provide accurate and correct information so the Army can program responsibly.

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Detailed planning leads to success in postwide open building automation systems

by David Schwenk and Joseph Bush

A report prepared for the U.S. Army Installation Management Command offers guidance, including installation design guide recommendations, for Army garrisons to develop a strategy for implementing an enterprise-level, “open” postwide building automation system. The technical report *IMCOM LonWorks Building Automation Implementation Strategy* is available at http://www.cecer.army.mil/techreports/ERDC-CERL_TR-07-16/ERDC-CERL_TR-07-16.pdf.

Historically, building control systems such as those used for heating, ventilating and air-conditioning present many different challenges, all of which can add up to inefficient energy use. Underlying some of these problems is the fact that the controls installed in buildings are usually vendor-specific and therefore, proprietary. Even in this age of direct digital control technology, installations still install BASs on a building-by-building basis, resulting in systems incompatible with any centralized control.

In 2004, two Unified Facilities Guide Specifications were released to enable the use of multi-vendor, open BASs to be integrated with a single, postwide utility monitoring and control system. The UFGSs for BASs are based on LonWorks technology, and the American National Standards Institute and Consumer

Electronics Association Standard 709.1 communications protocol:

- DDC guide specification – UFGS 23 09 23: *LonWorks Direct Digital Control for HVAC and Other Building Systems*;
- UMCS guide specification – UFGS 25 10 10: *LonWorks Utility Monitoring and Control System*, where this UFGS specifies the centralized front-end including operator workstations.

While the UFGSs are designed to address many open system pitfalls, implementation challenges extend beyond the designer’s usual realm of responsibility. In addition, planning for interoperable systems must be specific for an installation because requirements vary from site to site. However, some standard steps for developing an implementation strategy can help guide the installation’s planning.

Getting started

Garrisons should begin the planning process by creating a work group whose members include, as a minimum, representatives from the Directorate of Public Works including the energy manager, engineering staff and maintenance shops; the Network Enterprise Center, formerly the Directorate of Information Management; and the Corps of Engineers’ district and area offices. Obtaining buy-in from stakeholders and close coordination with the NEC are both critical to the open BAS network’s success.

The work group’s key functions include:

- identifying a mechanism and approach though which the installation can obtain system integration services where multiple vendors’ DDC systems are integrated with the UMCS front-end;
- coordinating and working with the NEC on information assurance and security requirements, in particular, the certification of the UMCS through the Department of Defense Information Assurance



Gregory Bean (standing), Fort Bragg’s director of Public Works, and Coby Jones, UMCS manager, review the status of Fort Bragg’s building automation system at the UMCS workstation. U.S. Army photo

- Certification and Accreditation Process, which is best accomplished as an addendum to the NEC’s existing DIACAP;
- making sure points schedule drawings are developed for and used on all DDC projects; and
- performing DDC system quality verification and acceptance activities, especially for the first few projects to help ensure that DDC contractors understand the project requirements.

Other guidance

Information in the technical report captures years of building automation systems experience by the U.S. Army Engineer Research and Development Center’s Construction Engineering Research Laboratory, Huntsville Engineering Support Center and the Corps’ Savannah District. In addition, the report documents valuable lessons learned through experience in helping installations work through successful open BAS implementation, such as at Fort Hood, Texas, and Fort Bragg, N.C. Notably, both forts received the *LonMark International Multi-Vendor Project of the Year* award for their successes — Fort Hood in 2007 and Fort Bragg in 2010.

Included with the planning guidance are nine appendices to augment information in the report:

- Example control systems assessment ➤

Acronyms and Abbreviations	
BAS	building automation system
DDC	direct digital control
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process
DOIM	Directorate of Information Management
DPW	Directorate of Public Works
HVAC	heating, ventilating and air conditioning
IMCOM	Installation Management Command
NEC	Network Enterprise Center
SOW	statement of work
UFGS	Unified Facilities Guide Specification
UMCS	utility monitoring and control system



Microchips to offer easy field testing for perchlorate, other pollutants

by Don Cropek and Imee Arcibal

As you get ready for work in the morning, energetic rock music blasts from the CD player to get you going. Then, after a hard day at work, you swap that rock disc for a soothing classical CD to help you relax. On the weekends, some smooth jazz sets the tone with a laid-back vibe.

In the future, testing for toxins in water supplies may be as simple as popping a new disc into a CD player. The underlying science is complex and elegant, but as with all successful technologies, that will be transparent when new microchip-based sensors are used to detect contaminants.

The U.S. Army Engineer Research and Development Center has developed a small, fluidized “laboratory-on-a-chip” that selects for and detects perchlorate in environmental water samples. The chip quickly analyzes water, requiring less than 60 seconds per sample, and can also be used in place to continuously screen water supplies for contamination. It is designed to be field-portable in contrast to current test methods, which require the water in question to be collected and shipped to an off-site laboratory for time-consuming analysis.

The U.S. Environmental Protection

Acronyms and Abbreviations

CERL	Construction Engineering Research Laboratory
ERDC	Engineer Research and Development Center
ppb	parts per billion

(continued from previous page)

- statement of work;
- DOIM/NEC frequently asked questions;
- Sample memorandum of understanding between DPW and DOIM/NEC;
- Sample installation design guide;
- Sample SOW for UMCS administrator, technical support personnel and system integrator;
- Sample SOW for UMCS DDC integration;

Agency issued an interim drinking water health advisory in January 2009 that established a safe limit of 15 parts per billion for perchlorate in drinking water. This contaminant affects the human thyroid by preventing iodine uptake, interfering with normal hormonal and developmental processes. Perchlorate can pollute water supplies in several ways, including fallout from pyrotechnics such as fireworks and road flares, some natural mineral formations and agricultural fertilizers. At Army installation training ranges, other possible sources are the smoke bombs used to simulate ground burst and hand grenades, and signal flares.

The sensor chip works by simultaneously introducing the sample and a buffer that can selectively bind perchlorate while other abundant compounds such as chlorides, nitrates and sulfates are not affected. When perchlorate reaches the detection zone of the chip, a measurable conductivity peak proportional to the concentration can be seen. In its current state of development, the chip can detect 5.6 plus or minus 1.7 ppb in drinking water, well below EPA’s regulatory level of 15 ppb.

The perchlorate chip represents the first of several sensors that ERDC is developing as modules for a robust, field-deployable sensor platform called SafePort. The other chips will contain buffers selective for

- DDC integration process;
- Example implementation plan; and
- UFGS 23 09 23 compliance checklist.

Additional information is available at <https://eko.usace.army.mil/fa/bas/>.

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David Schwenk and Joseph Bush are mechanical engineers and senior project managers, ERDC-CERL, Champaign, Ill.



The SafePort housing structure contains the components that integrate the contaminant-specific microchip (black) with the external environment to sample and analyze water in the field. Photo by Travis King

toxins like nitrates, arsenate and heavy metals, and explosives residue such as 1,3,5-trinitroperhydro-1,3,5-triazine, better known as RDX, and 2,4,6-trinitrotoluene, or TNT.

To enable field use, SafePort is cell-phone-sized for hand-held operation by a Soldier on the move and can provide instant feedback on any water sample encountered. The platform consists of a housing structure integrated with sample introduction, filtration and fluidic control that will be run by on-board electronics capable of yielding a simple result for contaminants in a water sample.

In the future, the SafePort platform could be installed on process streams or in monitoring wells, allowing installations to inexpensively monitor environmental conditions in real time.

The entire SafePort package is under development at ERDC’s Construction Engineering Research Laboratory. A usable device for perchlorate is expected to be ready for testing in fiscal year 2012. At that time, CERL will be looking for field sites for testing and for real-world samples to be contributed from installations.

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Career development – Embracing sustainability and planning for integrated, comprehensive installation decision-making

by Lt. Gen. Robert L. Van Antwerp

As we look ahead at 2011 and beyond, those of us in the engineer and scientist career field share the awesome responsibility for finding innovative solutions to an increasingly more complex array of challenges facing our Army and our nation. We are being asked to take a “systems approach” to project development considering many new and interrelated factors, such as sustainability, energy reliability and environmental stewardship, while continuing to meet immediate mission requirements and preserve long-term installation and water system capabilities.

Since so many of our products and services have a cumulative effect on the surrounding environment, the culture of single-focused design and development projects is becoming a thing of the past, forcing us to relook our projects and programs from a different perspective.

For our career field to respond to these complex challenges, we need to apply disciplined thought in reassessing the way we provide solutions to the built environment. This integrated approach involves both the way we deliver our services to our customers and the way we as professionals approach our day-to-day projects. Responding to these complex challenges involves three major aspects: engaged leadership, team integration and technical competency.

Leaders of the engineer and scientist career field must be engaged in championing the values of comprehensive problem solving. Our engaged leaders must insist that our teams solve problems holistically and that design, planning and other technical professionals are brought early into the process.

Further, as leaders and technical experts in our functional fields, we need to make sure we do not have blind spots in our perceptions of the problems that limit the ability of our teams to make holistic and



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

comprehensive solutions. The solutions of the past 40 to 50 years might not be the recipe for the complex challenges we face.

Team integration is the second aspect of meeting our future challenges. By embracing an integrated process team approach to problem solving that leverages a broad range of technical competencies to include architects, landscape architects, environmental specialists, planners, operations and maintenance personnel, and research and development professionals. We must continue to focus the development of our team members on processes that embrace a holistic, comprehensive problem solving approach. Furthermore, we must continue to enhance our skills in collaborative problem solving methods and in using visualization techniques to bring clarity to complex issues. Since this comprehensive approach involves intensive participation by stakeholders and visualization practices, the competencies that planners and architects develop are particularly valuable to the integrated process team.

The last aspect to meeting our future challenges is to ensure technical competencies are maintained. This means we continue to invest in our precious resource — our people — as individuals and teams. Lifetime learning is essential to master the competencies required to meet both the current and future needs of our

Acronyms and Abbreviations

USACE	U.S. Army Corps of Engineers
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installations that are home to the Soldiers, Civilians and Family members that we so proudly serve.

I highly encourage continued skills development for our installation planning professionals. For example, The U.S. Army Corps of Engineers Installation Support Community of Practice has established a Master Planning Institute through the USACE Learning Center that provides the only accredited planning curriculum in the federal government. Those enrolled in these courses learn in a team setting with their peers in a hands-on, experiential learning environment.

Another key component of technical competency is ensuring we have the right skill sets in the right place. We need to consider hiring planners, architects and landscape architects for planning positions since they are trained in comprehensive problem solving. Further, we need to consider more interdisciplinary positions where considerations are made for not only traditional engineering, but also architecture, landscape architecture and urban planning expertise. We need staff skilled in comprehensive planning, holistic problem solving, stakeholder facilitation and visualization.

As members of the engineer and scientists career field, we all are committed to promoting a practice that provides the most competent engineering design solutions for those we serve. For our career field to advance from Good to Great, we have to embrace a holistic approach to planning and design.

This step takes leaders willing to champion the comprehensive approach. Hence, we need to get the right people onto our integrated teams and into key planning positions to champion holistic, comprehensive solutions. We also need to invest in our own



Importance of professional planning credentials

by Andrea Wohlfeld Kuhn

Army planners are encouraged to pursue American Institute of Certified Planners designation from the American Planning Association. Professional credentials are a reflection of expertise and commitment to the profession and provide recognition both to the individual and the organization.

To obtain certification and use the AICP designation, APA members must meet certain education and experience requirements and pass a written examination. The higher designation of Fellow in AICP, or FAICP, recognizes the achievements of individuals who are considered model planners and who have made significant contributions to planning and society.


In addition to the eligibility requirements, a candidate must be a member of APA to sit for the exam. The cost is \$485, and the eligibility requirements are spelled out in the chart.

The exam is given twice a year, in May and November. Degrees and professional work experience in related professions such as engineering, landscape architecture, architecture, environmental planning, history, geography and others may qualify one to take the exam.

Online training and exam preparation is available through state APA chapters and

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professional competency to broaden our understanding of comprehensive planning and development. This is the recipe for success that will help us meet today's sustainability and energy challenges and give us the capabilities for successfully addressing the challenges and opportunities of the future.

Lt. Gen. Robert L. Van Antwerp is chief of engineers, commanding general of the U.S. Army Corps of Engineers and the functional chief of Career Program 18, Engineers and Scientists – Resources and Construction. 



*Andrea Wohlfeld Kuhn
Photo by Mary Beth Thompson*

private companies. More information can be found at <http://planning.org/aicp>.

New: Advanced specialty certification

Two new advanced exams are now available for AICP-credentialed planners who seek recognition for their specialized knowledge, experience and leadership in the transportation and environmental planning fields. The Certified Transportation Planner and Certified Environmental Planner exams are given once a year at a cost of \$690 each.

To qualify, applicants must be AICP members in good standing and have at least eight years of experience in the area of planning specialization for which they will be tested.

This year, applications must be made by March 30, and testing will occur during a two-week window from May 9-23. Additional information is available at www.planning.org/asc.

Level of education	Years of professional planning experience required
Graduate degree in planning from a program accredited by the Planning Accreditation Board	2
Bachelor's degree in planning from a program accredited by the PAB	3
Graduate degree in planning from a program not accredited by the PAB	3
Any other post-graduate, graduate or undergraduate degree	4
No college degree	8

Acronyms and Abbreviations	
AICP	American Institute of Certified Planners
APA	American Planning Association
CM	Certification Maintenance
PAB	Planning Accreditation Board

Credentialing maintenance requirements

Effective Jan. 1, 2008, AICP members must engage in continuing education in order to maintain their certifications. The intent of certification maintenance is to enhance the credibility of the planning profession and increase the value of AICP credentialing. The requirement ensures that members have current knowledge, skills and training in best practices.

AICP members must earn a total of 32 CM credits during a two year period. One hour of training equals one CM credit. A minimum of 1 1/2 credits must be on the topic of ethics, and another 1 1/2 credits must be on current planning law.

More information can be found at <http://planning.org/aicp>.

These required CM credits are available through the Master Planning Institute Proponent Sponsored Engineer Corps Training suite of classes. *(Editor's note: See article on page 41.)*

Certification enables planners to demonstrate their knowledge and dedication to the profession and may very well be the cornerstone of their careers.

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Andrea Wohlfeld Kuhn, AICP, LEED Green Associate, is a senior planner, Headquarters, U.S. Army Corps of Engineers.





Master planning classes go worldwide in 2010

by Andrea Wohlfeld Kuhn

The Army's master planning courses are held throughout the United States each year and are offered to audiences worldwide on request. In 2010, classes were held in Guam, South Korea and Italy.

Advanced Master Planning in Guam

At the request of the Navy, the instructors took Advanced Master Planning, Proponent Sponsored Engineer Corps Training course 952, to Guam in March. As an island, Guam's development and expansion capabilities are naturally limited. Careful planning — with environmental awareness of water, energy and transportation constraints — is a must and is the key to development or redevelopment.

Similar to other class offerings, the course was taught using a multi-media approach. Lectures, small group exercises and site visits give students an understanding of existing conditions and development potential.

The students developed a master plan for the Barrigada area, which is slated for redevelopment with administrative, maintenance, medical, industrial and community facilities. Working in small groups, they developed several alternatives for its redevelopment.

Using a compact development approach and awareness of topographical and environmental constraints, the students sited the required facilities and maximized land use. Their proposals featured a walkable, campus-type development based on sustainable planning and design principles and capitalizing on synergies created by consolidating functions and uses. Improved transportation access and incorporation of environmental and security requirements contributed to a number of solid alternatives.

Students presented their proposals to the commanding officer on the final day. He was impressed with the quality of work, attention to detail and proposed solutions.

Visualization, Advanced Master Planning in South Korea

In September, PROSPECT course 948, Master Planning Visualization Techniques, and Advanced Master Planning were held in Daegu. The visualization students learned the basics of Google Sketch Up and Adobe Photoshop.

Students in the advanced class observed planning patterns on a tour of downtown Daegu, where limited land availability and large population growth make compact development a necessity. The students applied compact development and sustainability principles to create solutions for Camps Henry and Walker. The proposals combined the two camps into one, creating greater efficiencies and a more sustainable environment.

Learning from the master in Italy

In October, Advanced Master Planning was held at U.S. Army Garrison Vicenza, Italy. Students had the best of both worlds: they toured the existing Villaggio della Pace Army Family Housing Area to develop innovative solutions for the future, and they learned from the great master Andrea Palladio, a 16th century architect whose classic designs play a prominent role in the look and feel of Vicenza. Palladio has had a major influence on architecture worldwide. Many U.S. federal buildings are built in the Palladian style, which emphasizes symmetry and draws from the formal classical architecture of ancient Greek and Roman temples.

After hearing lectures, doing small group exercises and visiting local sites, students were assigned to redevelop the Villaggio della Pace. Existing site development is similar to a typical U.S. suburban community — auto-dependent with single-family and townhouse units, a small shoppette and limited recreational amenities.

The students engaged in an intensive charrette exercise and developed several alternatives that met their goal of creating

Acronyms and Abbreviations

PROSPECT	Proponent Sponsored Engineer Corps Training
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Advance Master Planning course students in Guam work on a plan for the Barrigada area of the Navy base. Photo by Jill Schreiber

a more walkable, sustainable, livable community. Their designs were based on the planning patterns and architectural features they observed in Vicenza and information from class lectures and group exercises.

By creating more compact development and consolidating compatible uses, they were able to add educational facilities, multi-purpose gathering spaces to foster social sustainability and recreational opportunities, and create a better integration of facilities and uses. They also improved the linkage to the main post, improving transportation flow and access.

The concept of social sustainability has become increasingly important as a means to counteract the Army's high suicide rate and the negative aspects associated with frequent deployments. If planners can create social interaction opportunities, Soldiers and their Families are able to interact more easily and readily with others, helping them to develop support systems, and diminish isolation and the negative impacts linked to a lack of social sustainability.

The students presented their proposals to the garrison commander on the last day. His response was very positive. He ➤



Master Planning Institute announces classes for 2011

by Andrea Wohlfeld Kuhn

The U.S. Army Corps of Engineers is a unique educational provider in terms of the scope and breadth of classes offered and the accompanying professional accreditations for its classes. Over the next year, Proponent Sponsored Engineer Corps Training classes in the field of master planning will be expanded to offer additional training opportunities. In keeping with the intent of this suite of classes, these offerings will be called the “Master Planning Institute.”

Classes are open to all interested parties, including contractors; private citizens; and federal, state, city or county employees. These accredited classes provide American Institute of Certified Planners’ certification maintenance units, American Institute of Architects’ learning units, National Society of Professional Engineers’ professional development hours and continuing education units. For American Institute of Certified Planners’ members, these classes provide the required certification maintenance units for hard-to-find ethics and law classes.

Classes are dynamic. They are taught using a variety of media that include lectures, hands-on training, small group exercises, field trips and other learning opportunities.

The 2011 Master Planning Institute classes include:

Course 392
Historic Structures I
March 14-18, Seattle

This course provides an awareness

(continued from previous page)

encouraged the students to continue to draw from European planning concepts of compact, sustainable, walkable neighborhood development as they carry on with revisions to the master plan.

Courses at your locale

PROSPECT master planning courses can be tailored for your installation. For

of the unique characteristics, legal requirements, procedures, technical knowledge and skills necessary to administer, maintain and repair federal historic properties. Pertinent laws, regulations and guidance are covered.

Course 952
Advanced Real Property Master Planning

May 16-20, Portland, Ore.

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

Course 326
Master Planning Applied Skills
July 25-29, Huntsville

This class provides an overview and techniques to develop real property requirements and allowances, and assess stationing actions. Students learn how to use Army planning tools to conduct planning studies and requirements analyses, and to determine the impact to the installation’s real property master plan.

Course 101
Real Property Master Planning I
July 25-29, Huntsville
Nov. 14-18, New Orleans

This course provides an introduction to master planning concepts and principles.

more information, contact the POCs below.

POCs are Jerry Zekert, 202-761-7525, jerry.c.zekert@usace.army.mil; and Andrea Wohlfeld Kuhn, 202-761-1859, andrea.w.kuhn@usace.army.mil.

Andrea Wohlfeld Kuhn, AICP, LEED Green Associate, is a senior planner, Headquarters, U.S. Army Corps of Engineers.



Master planning students visit the new urbanism community Orenco Station in Portland, Ore. Photo by Jill Schreiber

It provides an overview of the planning process with an emphasis on general planning principles that are applicable to all organizations and levels of government.

Course 102
Real Property Master Planning II
Dec. 5-9, San Antonio

This course is the companion, follow-on course to Real Property Master Planning I. It expands on the basic planning concepts and relates them to Army-specific examples and issues. Both courses offer a combination of lectures, small group exercises and site-specific learning opportunities.

Note that the former Course 75 has been expanded into two separate courses. Master Planning I provides an introduction to basic planning topics, and Master Planning II covers application of these concepts to Army-specific planning.

To register or view course descriptions, go to <http://pdsc.usace.army.mil>, or contact Janine Wright at 256-895-7431 or Janine.p.wright@usace.army.mil.

POCs are Jerry Zekert, 202-761-7525, jerry.c.zekert@usace.army.mil, and Andrea Wohlfeld Kuhn, 202-761-1859, andrea.w.kuhn@usace.army.mil.

Andrea Wohlfeld Kuhn, AICP, LEED Green Associate, is a senior planner, Headquarters, U.S. Army Corps of Engineers.



April in Boston: Army Planning Symposium

by Andrea Wohlfeld Kuhn

Are you a planner or someone in a related discipline who wants up-to-date information on Army planning issues? Or, perhaps you've been involved in a planning initiative or developed innovative solutions to planning challenges. If so, "plan" on attending this year's Army Planning Symposium in Boston April 5-6. You'll gain firsthand knowledge of current planning issues and trends, have the opportunity to share best practices and expand your repertoire.

The U.S. Army Corps of Engineers will host the symposium at the Boston Marriott Copley Place. This is an excellent opportunity for the Army's Master Planning Community of Practice to exchange information on successful Army practices and gain knowledge of current planning trends. In addition, the Air Force, the Navy, the Coast Guard and the National Park Service will conduct their respective symposia at the same time, creating networking opportunities for an exchange of federal planning information.

There is no registration fee for the Army symposium. Topics will include:

- Office of the Assistant Chief of Staff for Installation Management and Installation Management Command overviews;
- an update on Army Regulation 210-20, *Real Property Master Planning for Army Installations*;
- form-based coding;

- energy and sustainability issues; and
- best planning practices.

Since the agenda is still open, nominations for topics and presentations are welcome. Contact the POCs below if you wish to make a presentation.

Attendees are strongly encouraged to register for the Federal Planning Division's National Training Conference April 6-8, which immediately follows the Army symposium. This year's theme is "Federal Lands – Great Places" and focuses on federal property as the nation's greatest resource. Tracks will include sessions for the new federal planner, emerging initiatives, facilities and infrastructure planning, open space planning and professional development.

Lodging at the conference hotel is limited. Attendees should register and secure lodging early. Last year, about 400-500 federal planners attended the National Training Conference, and another large turnout is expected this year.

Conference details and lodging information can be found at http://www.federalplanning.org/annual_workshop.htm/.

Those who seek an even broader planning perspective should also attend the American Planning Association's National Conference at Boston's Hynes Convention Center April 9-12. The Headquarters, USACE, Master Planning

Acronyms and Abbreviations

USACE | U.S. Army Corps of Engineers



Attendees at the 2010 Army Planning Symposium discuss their hands-on planning exercise. Photo by Jill Schreiber

Team will facilitate a workshop, "Form-Based Codes: Regulating Sustainable Development," there April 9 from 8 a.m. to noon. Attendees will learn about the mechanics of form-based codes and have the opportunity to create sample codes.

Information and registration for this conference is available at <http://planning.org/conference/index.htm>.

To register for the Army Planning Symposium, contact one of the POCs below.

POCs are Jerry Zekert, 202-761-7525, jerry.c.zekert@usace.army.mil; and Andrea Wohlfeld Kuhn, 202-761-1859, andrea.w.kuhn@usace.army.mil.

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

Directorate of Public Works class changes

by Gustavo (Gus) De Jesus

For Directorate of Public Works classes, there are some changes to what is listed in the 2011 Purple Book, which publishes the Proponent Sponsored Engineer Corps Training known as PROSPECT courses.

Course 903, DPW Operations and Maintenance, is scheduled for Feb. 14-18 and July 11-15 in San Antonio.

Course 981, DPW Budget/Job Cost

Accounting, is no longer offered.

Course 988, DPW Basic Orientation Course, is scheduled for April 18-22 and May 16-20 in San Antonio.

Course 989, DPW Management Orientation Course "CAPSTONE", is scheduled for June 6-10 in San Antonio.

To see full course descriptions, fees and other information, go to <http://pds>.

usace.army.mil or e-mail DLL-CEHNC-Registrar@usace.army.mil.

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Gustavo (Gus) De Jesus is the chief, Sustainment, Restoration and Modernization Branch, Public Works Division, Headquarters, Installation Management Command, and the proponent for IMCOM DPW Courses.



Kathryn Haught: Champion for master planning

by Jerry Zekert

Kathryn Haught is the Army's new Master Planning program manager for the Office of the Assistant Chief of Staff for Installation Management.

Haught has broad experience with master planning and Military Construction management. She has worked at the installation level, at Installation Management Command region and headquarters offices, and at OACSIM, making her a champion who understands the installation's challenges with managing a successful planning program.

After graduating from Virginia Tech in 1987 with a bachelor's degree in industrial engineering and operations research, Haught began her Army career with the planning team in the Directorate of Public

Works at Fort Bragg, N.C. As a member of Fort Bragg's top-notch master planning team, she developed implementation strategies, programmed recommendations, managed design and construction, and oversaw extensive World War II-era building demolition.

In February 2005, Haught departed Fort Bragg, for Fort McPherson, Ga., to become the master planner for the Installation Management Agency Southeast Region. During her time there, she worked primarily with the installation master planning offices on the 2005 Base Realignment and Closure statute.

In May 2006, Haught took a position with OACSIM BRAC Division where she served as the Fort Belvoir, Va., BRAC program manager until her current assignment.

Haught's role is to be the Army's proponent for master planning and the champion on the Army staff for great master planning. She is currently leading the update to Army Regulation 210-20.

Since her assignment, Haught has visited and worked closely with planning teams at both Headquarters, U.S. Army Corps of Engineers, in Washington, D.C., and Headquarters, IMCOM, in San Antonio. She has spoken on the importance of planning during planning classes and at the garrison commanders' Pre-Command Course.

The Army's master planning team has informally been named the Planning Triad. This triad is led by OACSIM and includes IMCOM, which implements the program, and USACE, which provides technical advice and support. A triangle is the most stable of shapes, and with Haught joining the team, the triad is complete and recommitted to embracing the best sustainable installation planning practices within the Army and the Department of Defense.

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

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

Acronyms and Abbreviations

BRAC	Base Realignment and Closure
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management
USACE	U.S. Army Corps of Engineers

Krajewski, Almquist retire

by Mary Beth Thompson

John Krajewski departed the Public Works Division of Headquarters, Installation Management Command, at the end of December. Krajewski, a long-time Army engineer, was an IMCOM contract employee for the past six years. He handled the *Directorate of Public Works Awards* program and worked diligently on Career Program 18 issues on behalf of IMCOM.



*John Krajewski
Photos by Mary Beth Thompson*

"This will be my second retirement but still not sure if it will be the last," Krajewski said.

Greg Chislett, chief of the Public Works Division, and Gus De Jesus, chief of Sustainment, Restoration and Modernization, will hold the flag for IMCOM CP-18 issues, Krajewski said.

Pete Almquist, an Army engineer for more than 40 years, retired from his post with U.S. Army Corps of Engineers' Installation Support Community of Practice in early January.



Pete Almquist

Almquist handled the Installation Support budget and was familiar to many in his roles with USACE liaisons to IMCOM, project managers forward and the "checkbook."


Acronyms and Abbreviations

CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
IMCOM	Installation Management Command
USACE	U.S. Army Corps of Engineers

More than 75 people attended his retirement luncheon Jan. 19. Almquist, known for his sense of humor, was the subject of many quips and anecdotes. With tongue in cheek, he managed to get his own back during his remarks.

"Let me make it very clear," Almquist said deadpan, "I'm not going to miss the people, but I sure am going to miss the work."

The crowd loved it.

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

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