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The top two images show the proposed mixed-use mission support facility at U.S. Army Garrison Miami, Florida, that combines logistics and administrative uses into one connected building supporting footprint reduction, resiliency, energy efficiency, low impact development, and mission effectiveness goals. The proposed barracks (bottom image) follow the apartment model first developed at Fort Leonard Wood with one building sized for no more than 10 residents. This makes the building exempt from anti-terrorism/force protection requirements and much more efficient in terms of total cost and area required.
See article on Page 15 *(Images courtesy of The Urban Collaborative, LLC).*

This Issue:
Master Planning, Housing, and Barracks

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ADP's: Door stops, shelf decorations or reminders of our future?

by Sally Pfenning

Recently, I sat in a meeting where I had an Army leader tell me that he didn't believe in Area Development Plans, because history dictates that these expensive documents become large "paperweights," "shelf decorations," or "doorstops" and are completely useless. I'm sure most of us in this business have heard this in reference to Area Development Plans or Master Plans in general.

This particular discussion came over the review of our Area Development Plan pre-final draft, finding that it was not in agreement with the back of the envelope solution to the problem at hand, which the team was seeking to simply validate and refine. In this case, the Area Development Plan had been contracted for the sole purpose of validating a program that was already funded to guide multiple project scopes of work. I laid my head on the table in exhaustion, and asked, "Then WHY the heck did you contract for an Area Development Plan when all you wanted was the development of multiple project details?"

His primary concern, at this point, was that the proposed preferred 25- to 50-year plan would give a false sense of expectations concerning what we planned to do during the next five years. I sure would hope that any ADP would give far more information than additional projects for the next five years, perhaps, sequencing of projects, connection of streets, sidewalks and circulation, so improvements could be made in each project design. We then entered into discussions about deleting all of the visionary long range components, because we don't want to "promise" too much.

Sally G. Pfenning

An Area Development Plan is not a promise, it is hope. Vision is not a funding strategy, it is a reminder of what matters so we can take advantage of opportunities to make a difference, in the moments they arise. An Area Development Plan doesn't describe where we actually are going, rather it serves as a continual reminder of where we should go.

A few years ago, I was involved with a bold team that dared to completely reorganize a major installation through the use of Area Development Plan visioning. In many cases, they showed buildings that had just been constructed, being demolished, and showed different land uses on top of an area that was slated to construct brand new homes, for soldiers and their families. A team with a lesser vision, would not have even thought about it, let alone work it through many Garrison Commanders to gain an understanding and buy in by multiple Installation Senior Commanders, that this is really what is required to fix 100 plus years of random growth that had led to incompatible uses. It was clear that with no change in direction, the quality of life for those living and working on the installation would deteriorate significantly.

No one on that team was worried about what this vision would cost, because to even consider that would have been to destroy support for that plan. Folks across the installation bought into the vision, without any idea of how to resource it.

To make a long story short, that plan was the basis for multi-stakeholder changes to the future of the installation. Changes in force structure opened a window of opportunity that the Area Development Plan allowed everyone involved to see clearly. The new homes may not be needed in the near future, allowing the installation to realign its upcoming Military Construction projects into the vacated footprint, approximately $300 million in projects, at a savings/avoidance of utility infrastructure upgrades of about $80 million. The footprint vacated by Military Construction opened up opportunities to improve the entrance and access control area. The Area Development Plan allowed the installation to reap savings for the Government, while re-aligning its footprint to that which many said was a pipe dream. None of that would have or could have happened without a bold and unconstrained vision, as was laid out in the Area Development Plan.

Do not contract for an Area Development Plan to answer the question, "What should I do now to solve the current installation problems?" For that, all you need is a Short Range Component, or some targeted design, as no one can really see anything beyond five years when working for our Army. Contract for an Area Development Plan if you want to set a vision for the future, to understand that as our installation grows, and changes, how it needs to be organized to best serve its inhabitants.

As a leader, one should review the Vision and associated plans often so the impressions remain in the forefront of the mind, so one can most easily recognize the opportunities when they arise, to move one or many steps in the direction of an improved future. Update the document when the unforeseen has happened to ensure that it remains relevant. The Area Development Plan organizes the effort for us, allowing our thoughts and work to be passed from leader to leader, tweaked and improved upon, to truly remain a "living document" and not an expensive door stop.

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The state of master planning in today's military

by Edmond Gauvreau

As we start a new year I wish to summarize my thoughts about the past year, current state of affairs, and the future direction of master planning, both through the U.S. Army Corps of Engineers and across the Department of Defense. These remarks reflect my thoughts and not necessarily those of the Corps of Engineers or the Army, but are meant to initiate in-depth discussion on the future form and function of Army installations.

During 2017, the Corps of Engineers saw many professional and personal accomplishments across the agency. The Federal Planning Division of the American Planning Association selected eight Corps of Engineers planning projects and programs for awards at its 2017 meeting in New York City. These awards confirm that the Corps of Engineers through its Planning Support Centers and personnel continue to pursue excellence in all aspects of installation master planning. During that same meeting, long-time Headquarters Corps of Engineers Team Leader Jerry Zekert received the Rik Wiant Award for sustained excellence – this was especially poignant as Rik was one of Jerry's past supervisors and mentors.

USACE executed more than $200 million in planning projects and programs for the Army as well as other DOD components around the world. Highlights include providing planning support for Army Central, Iwakuni Air Base in Japan, Fort Gordon, Georgia, in support of the Army Cyber Center of Excellence, and implementation of the Net Zero Planning tool across several installations.

We bade farewell to Andrea Kuhn as she retired at the end of 2016 after a long and storied career. In October, we welcomed Sean Martin as our newest addition to the Headquarters Corps of Engineers team, coming from U.S. Army Engineering and Support Center Huntsville, but also having extensive experience with the Office of the Chief Army Reserve.

As previously reported in this publication, I was honored this past year by being elected to the American Institute of Architects' College of Fellows, and receive the Urbahn Medal from the Society of American Military Engineers – both the direct result of leading this astute body of professionals and encouraging the pursuit of excellence in all aspects of the profession. I hope to continue living up to your expectations to lift our community to higher standards and achievements.

Moving on to the present state of the community – we continue to work on improving both capability and expertise within our Planning Support Centers. The Unified Facilities Criteria on the specific requirements on Area Development Plans is in final review and is expected to be issued early this calendar year. It will clarify what work is required to compile plans to guide present and future improvements at installations regardless of changing priorities, missions and available resources.

We continue to work with the U.S. Engineer Research and Development Center's Construction Engineering and Research Laboratory on cutting edge tools to improve the collecting and quality of planning data to improve our available products for installations.

Two concerns I have for this year: 1) assuring consistent quality of planning products and services from all Corps of Engineers planning support centers at fair and reasonable costs; and 2) the differences on implementation of DOD and Services' installation planning standards. We will continue validation assessments for a third of the Planning Support Centers this year, as well as conduct an All-Hands meeting of the centers during the April 2018 Federal Planning Division meeting in New Orleans.

I will continue to work with OSD, the Assistant Chief of Staff for Installation Management and other agencies to encourage full compliance with the fiscal 2013 and 2014 National Defense Authorization Act's intent for sustainable installation master planning for all the Services.

In an era of continuing tight budgets for military construction combined with an unstable and changing security environment world-wide, the need for installation master plans that demonstrate flexibility, resilience and sustainability is even more critical than ever. OSD has indicated that

Edmond Gauvreau

military construction projects submitted without DOD-compliant master plans will be rejected or deferred, emphasizing an increased importance in master plans based on direct observation, on-the-ground investigations, data-driven to show available capacity and potential, and tying specific projects and programs to realize the aspirations of the installation master plan.

I see more positive developments in the coming year where the planning community will be front and center to effect change. OSD is standing up a task force this year on Real Property Reform, focused on the processes for Sustainment, Restoration and Modernization projects – planning will be an important component of this study.

With increased emphasis on Readiness and Resilience, comprehensive master planning accomplished by trained and experienced personnel, using the latest technologies and tools, and following best practices, is even more critical to the overall health and well-being of defense department installations world-wide.

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Successfully planning for Army installations of the future

by Dennis K. Bohannon

CRYSTAL CITY, Virginia – The Acting Principal Deputy to the Assistant Secretary of the Army J. Randall Robinson spoke Aug. 3 to the Army Engineer Association about installations of the future and successfully planning for them, saying the outcome is paramount to the warfighting readiness posture of our Army.

He made the remarks during the group's Engineer Regimental Information and Training Seminar here to industry executives from a broad spectrum of engineering and energy service firms affiliated with the Army Engineer Association that support military installations, combat engineering, geospatial engineering and a wide variety of other specialties.

Robinson said installations are a crucial component of Army readiness, noting that each installation has a unique ecosystem - an integrated system of activities aimed at one outcome – a ready Army.

> *'When the Army designs for flexibility, such as multi-purpose buildings that can be converted and repurposed with changing requirements, we lower future restoration and modernization costs.'*
>
> *– J. Randall Robinson*

"I have been advocating for installations through different roles over many years now. I've seen periods of austerity and prosperity, an uncontrollable pattern that will likely continue. I believe we need a different, more deliberative approach for Army installations. Specifically, we need to stretch our planning horizon and look out to the deep future and set conditions today that will weather the budget elasticities to come. The Army must undertake a deliberative process to consider what installations should do and how to smartly invest in changes today... for needs or requirements in the future," Robinson said.

"While Army installation communities play a key role in attracting, training, and retaining the force, we have not developed a comprehensive means to plan for installation modernization." We must address this gap.

"In accordance with priorities, the Army has taken risk in installations to fund training and unit readiness; thus, resourcing installations has not been at the forefront of the Army's focused investment strategy," he said. "Looking forward, we plan to resource our Base Operation Support services at 94.5 percent of critical need."

Robinson pointed out that currently 22 percent of Army facilities are in poor or failing condition, "We have been behind in restoration and modernization as well as Military Construction recapitalization. Our goal is to invest using a deliberate strategy that maximizes Installation support of readiness."

"We need a deliberative strategy that maximizes the positive impact that available resources have on readiness. We are instituting a number of analyses and assessments, to prioritize and identify specific facilities, on selected installations that have the greatest impact on unit readiness – mobilization facilities, housing and community facilities, operations and training facilities, maintenance and production facilities. … Note, I've make multiple references to readiness. It's all about warfighting readiness," he said.

"Additionally, we are examining whether new, more flexible building designs can be used to reduce total life-cycle costs and to preclude additional, expensive modifications. When the Army designs for flexibility, such as multi-purpose buildings that can be converted and repurposed with changing requirements, we lower future restoration and modernization costs.

"The installation community is also examining whether we need to make more radical changes to how we characterize and make resource investment decisions for our installations. The Army is exploring a 'futures' process modeled on institutional methods that leverages the Training and Doctrine Command's, future 'operating

J. Randall Robinson

environment,' as well as activities being used by cities and urban designers to adapt to an evolving environment," Robinson said.

Just as the Army has an established process to examine the future operating environment and the weapons, formations, and training we need to prevail in that environment, Robinson said a similar process is needed for installations – one that is integrated in the Army's established process and strategic plan. This is critical, he added, as installations are included in the "battlespace" of current and future fights.

With an established process, the Army will have a framework to look through three lenses: a battlefield framework centered on a multi-domain battlefield; ever-evolving threats; and new opportunities born of technology.

"(We) are committed to support and help provide the best readiness platforms for the Army, and the best communities for our Soldiers, Families, and Civilians. Creation of premier Army installations and communities begins with a solid process for looking into the future and bringing it into the present," Robinson said.

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Defining resiliency: A planning approach to mission readiness

by Jerry Zekert and Mark Gillem

Resiliency in planning is not a new subject. William Penn's 17th century plan for Philadelphia focused in part on resiliency. He insisted on a site for Philadelphia that was "navigable, high, dry, and healthy." He wanted uniform streets with houses built in a line for ease of access and he wanted a "green country town, which will never be burnt."

Today, Philadelphia is one of America's great cities and is once again on the ascent in part due to Penn's resilient, simple, and elegant plan that can accommodate new uses and residents.

The Department of Defense has been considering resiliency in light of changing political, environmental, and fiscal realities. The U.S. Army Corps of Engineers, for instance, developed a *Resilience Initiative Roadmap* with three priority areas: 1) evolving resiliency practices; 2) supporting community resilience; and 3) focusing on priority areas. One of the priority areas is developing resiliency considerations for military installations, and that is where military planners fit into the discussion.

As retired Lt. Gen. Thomas Bostick, former U.S. Army Corps of Engineers commanding general, has noted, "With lessons learned from disasters such as Katrina and Sandy, and the necessity for military readiness, we know the Corps of Engineers has a lot to share in the resilience field."

Those lessons include four key resilience principles: prepare, absorb, recover, and adapt.

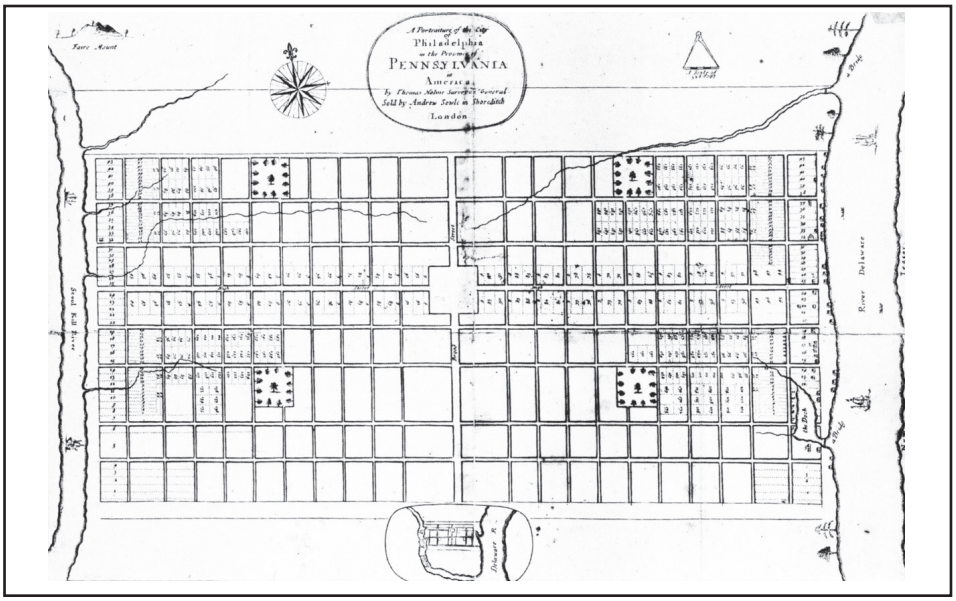
For military master planning, how broadly do we approach resiliency? If we think of it as encompassing everything (from climate change to unemployment to poor education), we may be off the mark. These are the **sustained threats** that many resiliency plans talk about at a high level. **Acute threats** are more immediate and should be the clear focus of our planning efforts as they will directly impact mission readiness in a real and measurable way. After all resiliency and readiness are tied together. These acute threats could be natural (floods, earthquakes, tornados, tsunamis, wildfires, etc.) or manmade (revolts, terror attacks, etc.). These are threats master planners can address. If planners approach resiliency with a focus on the acute threats that plans should address, they can organize work processes and products to address them.

One approach is to look at resiliency from a mission readiness perspective. Planners should identify the systems that, if compromised by acute threats, will impact readiness. There are generally three systems: 1) utilities (energy, water, wastewater, communications. etc.); 2) transportation (roads, ports, airfields, gates), and 3) facilities (critical, noncritical and supporting buildings). Acute threats impact each systems and vary by installation and region. Fort Hood, Texas, does not need to worry about sea level rise, which with wave action can be an acute threat, but the installation does need to worry about floods. Both threats can undermine all three systems in similar ways such as power outages, compromised road networks or blocked emergency services. Planners should identify what acute threats may impact readiness and map out how those threats impact each of the three interrelated systems. Solutions can be identified to increase each system's resiliency.

The process involves identifying the threat, assessing system vulnerabilities, identifying mitigation measures, and developing actionable solutions that could be inserted into a capital investment strategy like an Area Development Execution Plan – a repository of all needed projects to build a mission-ready plan. These solutions should help installations prepare for the threat; absorb the "hit" with as little impact to mission readiness as possible; recover quickly from the impact so missions can continue; and adapt the installation's physical structure to minimize impacts from future acute threats.

Resiliency is an approach much more than a plan. How do master planners deliver resilient installations that are durable across multiple threats? What processes should be in place to bring stakeholders together to identify threats and mitigations? Where is the nexus with sustainability so the worst case happens we can adapt to new more resilient models? How do we leverage current tools and techniques that are already supporting mission readiness? What criteria can planners implement to make installations more resilient when faced with acute threats to mission readiness?

Successful master plans should address these questions and help answer a key question from an installation's leadership: "So now what, what do you want me to do about it?" William Penn knew what to do; he planned a resilient city with simple and clear principles that have withstood the test of time. It is our turn to do the same for our installations.



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Deadline approaches for updating Real Property Master Plans

by Kathryn Haught

We are nine months away from the final deadline for updates of the Real Property Master Plans per policy outlined in Unified Facilities Criteria (UFC) 2-100-01.

Installation master planners need to remember that all installations are required to have master plans in compliance with UFC 2-100-01 per Office of the Secretary of Defense guidance and that "major military installations," as defined by the Defense Structure Report, are mandated by Congress to have master plans that addresses environmental planning, sustainable design and development, sustainable range planning, real property master planning, and transportation planning.

The Office of the Secretary of Defense intends for the Services to use the Real Property Master Plan for programming and ensure smart development as the Department of Defense mission evolves. The master plan's vision and goals are meant to provide a stable basis for planning and development as it represents the Garrison's opportunity to fulfill Army's overall strategy while providing quality of life and work for Soldiers, Families, and Civilians.

While constrained Military Construction funds limit opportunities for reshaping our installations in the immediate future, the Real Property Master Plans should reflect a future installation buildout that integrates the goals of UFC 2-100-01. Army wishes to be ready to execute such a vision as funds become available.

While the master plan's primary purpose is to support installation real property and real estate development and investment, UFC 2-100-01 also seeks to ensure that the plans provide valuable information to Headquarters, Department of the Army and the Office of the Secretary of Defense. We are concerned with possible impact from potential development. The analysis required to complete master plans per UFC strategies ensures that when we use the master plans to guide programming, we are following the most efficient alternatives for meeting real property mission requirements.

The Office of the Secretary of Defense remains committed to ensuring sustainability and smart planning on our installations, especially in regard to energy and water planning. The Installation Energy and Water Plan is a new requirement to be synchronized with the Real Property Master Plan. We are working on policy to ensure the two efforts work together. Army continues to move forward with innovative solutions for energy, water, and waste.

In support of federal goals for sustainability and resource conservation, the Office of the Secretary of Defense Installation, Energy and Environment issued a memorandum on March 31, 2017, directing the Services to create installation energy plans that are synchronized with the Real Property Master Plans. Master Planners will integrate results of these energy and utility plans within the master plan. Area Development Plans and network plans should reflect the long term real property development that supports these energy plans.

The Facility Investment Strategy remains in place, which emphasizes sustainment of existing resources, identification and disposal of excess, conversion, restoration, and modernization when appropriate, and construction of critical shortfalls only when the master planning process determines there is no better alternative.

The Reduce the Footprint initiative is active and will guide senior leader decisions regarding facility investment. Since we currently still have excess capacity at some locations, master planners are expected to identify critical assets and plan for disposal of non-critical excess facilities. This is an opportunity to reduce outlying properties and provide for more dense development at "city centers". Recognizing that Army requirements may require expansion again, installations should identify a growth boundary and prepare for future growth.

In support of master planning and the associated initiatives, Headquarters, Department of the Army will continue to use the Real Property Planning and Analysis System and the Installation Status Report as key sources for programming. Headquarters, Department of the Army will program according to the data contained in these databases. The constraints and opportunities in the master plan should reflect this information.

Regarding Army Regulation (AR) for master planning (currently AR 210-20 which will be superceded by AR 420-1, Chapter 10), the Office of the Assistant Chief of Staff for Installation Management is working with the Army Publishing Directorate to synchronize the entire regulation AR 420-1 and release for formal review. In the meantime, planners are reminded that UFC 2-100-01 provides guidance for completing the master plan.

Contact me at the Office of the Assistant Chief of Staff for Installation Management Operations Directorate if there are questions regarding compliance.

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Fort Knox offers Real Property Master Plan Executive Summary tips

by Ashley Ryan

Fort Knox, Kentucky, completed its Real Property Master Plan in January 2017 with the printing of the Executive Summary. An optional component to the master plan, it would have been easy to skip over, but the team was compelled to complete the process because the absence of the Executive Summary was counter to the entire planning process.

The development of the installation's Real Property Master Plan relied heavily on stakeholder input. Fort Knox had representation from several organizations at every planning exercise, but those organizations had nothing to show for their participation. Without the Executive Summary, it was difficult to garner stakeholder ownership and convey to new leadership the master plan's legitimacy. Composed of eight separate documents and more than 1,000 pages, the sheer size of the plan relegated it to the Master Planning office, binders, and file cabinets. The Executive Summary allowed us to take the plan out of the office and put it in everyone's hands.

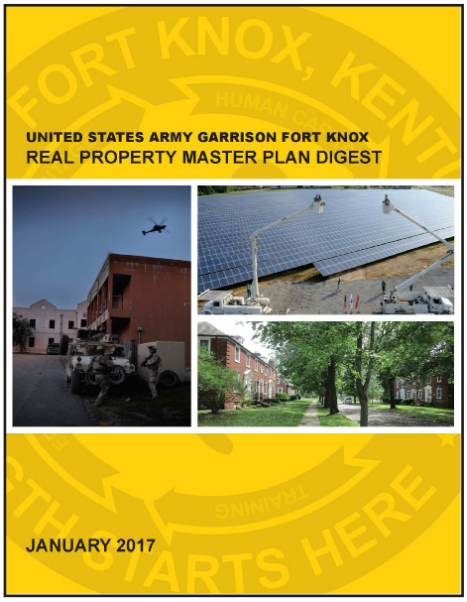
We completed our Executive Summary in-house and broke down the process into five steps:

1. **Take a deliberate approach to completing the Real Property Master Plan.** While it is the most critical and time consuming step, the plan cannot be summarized until it is complete, but steps taken during its development will help when it is time to summarize it. Throughout the planning process, we emphasized that all our documents needed to have a uniform appearance and format. This established a cohesive graphic standard for our fonts, page layouts and color choices that was easy to carry into our Executive Summary. It also ensured that we received the same kind of data in the same format with every component of the master plan. When it came time to pull the plans from our components straight into the Executive Summary, we didn't have to spend time making sure they all looked the same. By deliberately keeping the components similar, it was easy to blend them together into an Executive Summary.

2. **Research other Executive Summaries.** By attending various training offered by the Department of Defense Master Planning Institute and referring to the Engineering Knowledge Online website, we were able to review other installation Executive Summaries and determine what elements we wanted to include, and what we could leave out. We chose to emphasize our planning principles, developable area, framework plan, illustrative plans, ongoing plan implementation, and stakeholder involvement. This focus left out information like our regulating plan, form-based code and site constraints, which are important to planners but not easily understood by our general audience. By reviewing existing examples, we were able to select the elements that most powerfully communicated our message and aim to match them.

3. **Obtain and learn publishing software.** Publishing software was essential to the completion of the Executive Summary. See what is readily available, and take time to learn the software. Depending on what publishing software is available, you may find that someone on your staff is already familiar with these programs.

4. **Set a deadline and focus on completion.** We completed our last Area Development Plan in February of 2016, letting almost a year pass before we were able to complete our Executive Summary. We became motivated when we learned the Installation Management Command Commanding General was scheduled to visit the installation and as we were planning to brief him on our completed master plan, we decided we wanted him to have a copy of the Executive Summary. We built our deadline around the timing of his visit, which kept us focused on completing the task. Although the master plan is full of great ideas that we wanted to showcase, setting a deadline demanded the product remain a simple summary document, enabling us to make the Executive Summary a priority.



5. **Make hard copy prints.** Once the digital file is assembled, the next step is to send it to the printer. This requires reviewing examples of other booklets and then determining the weight, type of paper, and binding that best suited our document as we wanted something durable enough to travel well, but not so thick that it can't be flipped through.

Our Real Property Master Plan Executive Summary has become a staple at the Real Property Planning Boards, Installation Planning Boards and VIP visits. It has led the Master Planning and Real Property team to explore what other documentation can be designed around the work already completed by the master plan. It is the ultimate showcase of the hard work put into developing the Real Property Master Plan.

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Robust planning supports evolving installation priorities

by Rumanda Young and Mark Gillem

New leadership, new threats, and even new budgets frequently result in new initiatives for Department of Defense planners. Once hot topics like sustainability and consolidation give way to new concepts like resiliency, footprint reduction, and infrastructure resets. These are not whims but legitimate priorities driven by larger strategic interests. Planners (and their plans) need to be flexible enough to respond to this evolving guidance while always meeting mission requirements. Fortunately, with a robust planning framework in place, planners can drill down to the details required by higher authorities with ease regardless of the topic of the day.

Robust planning can position installations to successfully address the latest direction. It is important to note that the concepts below are best addressed at the district scale using appropriate Area Development Plans as the foundation and then follow-on plans as applicable, which may include Sustainability Component Plans, Area Development Execution Plans, Network Plans, or Customer Concept Documents.

Energy and Water Security

This is a maturing concept that plans should address at the building scale and at the district scale. Research shows that more compact development patterns significantly reduce energy consumption – in some cases by a factor of 2.5. These reductions are a key step toward energy security. Also, we know that deep energy retrofits can drop energy consumption in an existing building level by up to 70 percent. Simpler retrofits also can achieve impressive results. Even a focus on continuous retro-commissioning of systems can reduce energy consumption by 15 percent. Any building enhancements should be considered within the context of an overall plan using appropriate modeling techniques to forecast cost effective targets for new construction and renovation projects.

By following the DOD's process of creating Installation Energy Plans, which currently focus on energy and water, planners forecasted a 59 percent energy reduction in the capacity phase using a variety of contextually appropriate strategies at U.S. Army Garrison Hawaii, a 100 percent reduction at Fort Hunter Liggett, California, and a 54 percent reduction at Fort Hood, Texas. Using a similar process for water resulted in equally impressive forecasts.

Low Impact Development

This also is a fairly mature concept. As installations seek ways to address greater stormwater runoff volumes due to more frequent storm events, mitigating stormwater on site is more relevant. Integrated bioswales, low-maintenance green roofs, rainwater harvesting, permeable paving, and recreation spaces designed to accommodate and store runoff at peak flows are all viable strategies that should be considered in the planning process. Using these strategies at U.S. Army Garrison Hawaii resulted in in a 4 percent reduction in stormwater and a 36 percent reduction at Fort Hood.

Footprint Reduction

It is often easier to grow than shrink. Losing weight is hard and losing square footage on an installation is even harder since most buildings have been claimed by someone. But effective planning can find targeted areas for appropriate reduction through efficiencies, consolidations, and demolitions. For example, as part of the area developing planning process, Installation Management Command planners conduct appropriate facility assessments to identify opportunities for consolidation and footprint reduction. These opportunities can be integrated into the phasing plans and follow-on Area Development Execution Plans. Consolidation opportunities are generally greatest in warehousing and administrative spaces.

For example, at Marine Corps Air Station Iwakuni, Japan, planners found that through more efficient vertical storage systems, existing ambient storage warehouse space could meet future additional requirements without building new. Similarly, by moving to more collaborative office environments that balance open linear systems with limited private offices and ample quiet zones for small team or individualized work, planners at Hurlburt Field, Florida, found that administrative space in selected facilities could be reduced by 20 percent. These types of findings were identified through the development of Customer Concept Documents that followed Area Development Plans.

Infrastructure Resets

Like footprint reduction, infrastructure reset is a concept that focuses on reducing infrastructure to the most efficient level. For planners, this melds footprint reduction at the building level with infrastructure reduction at the network level. Opportunities to right-size and reset transportation infrastructure are abundant when we rethink parking requirements, road widths, and fire access lane requirements. For example, many installations have roads that are simply too wide for the traffic volumes. Using road diet concepts, paving can be reduced without significantly impacting throughout. At Marine Corps Air Station Iwakuni, the plans call for eliminating unneeded lanes on many streets and replacing that paving with green bioswales to reduce stormwater runoff and the heat island effect (which generates a demand for more air conditioning). Similarly, poor planning at many installations has led to a redundant road network around many new buildings due to the fact that actual roads are set at an appropriate standoff distance but that makes them too far for fire access lanes so a secondary fire access road network is placed around the building. If those access lanes double up with the sidewalks system (as is common on most college campuses) at least one ring of paving can be eliminated.

Resiliency

Resiliency in planning is not a new subject. Another article in this edition of the *Public Works Digest* addresses the concept in more detail. Simply put, robust planning is resilient planning. And resiliency leads to improved mission readiness. Good planning considers the acute threats to mission execution and mitigates those threats through tested strategies. One simple example, again at Iwakuni, is that new replacement housing will be designed to meet more stringent earthquake codes and elevated by at least three risers (18") from the street level. This height was set based on projected storm surges and will ensure homes are not flooded or unusable in the event of a flood. Another example at Iwakuni is the potential use of

(See Robust Planning, on page 10)

Area Development Planning takes root at USAG Stuttgart

by Dianne Wilson, Kevin Cooper, Shenita McConis and Doug Shaw

In 2017, U.S. Army Garrison Stuttgart Kaserne, with consultants HDR Engineering, Inc, completed Area Development Plans, or ADP's, for four of its six geographically distinct Garrison districts in Germany: Patch Barracks, Kelley Barracks, Panzer Kaserne, and Stuttgart Army Air Airfield. The Real Property Vision Plan, first component of the Real Property Master Plan, completed in 2016, identifies each distinct district in the Framework Plan, its primary focus, its supporting elements, and its appropriate services.

To accommodate an aggressive schedule, all four ADP charrettes were accomplished in the first half of the year, and the report submittals were expected to be finalized before the end of this year. ADP's comprise the third component of the RPMP, the Long Range Component, of the four mandatory components of the Real Property Master Plan process as described in the Army Regulation 420-1, Chapter 10. This comprehensive approach has proven beneficial as a decision made on one installation has impacts on others. For example, following the outlined primary focus, the Directorate of Public Works currently located on Kelley Barracks is programmed to move to Panzer Kaserne, the Community Support Hub, which will afford AFRICOM much needed space to expand.

Rendering of the Pedestrian J-Mall, which will replace Oak Strasse on Kelley Barracks, part of U.S. Army Garrison Stuttgart, Germany, creating pedestrian activity and promoting connectivity. (U.S. Army graphic)

ADP's facilitate the effective and efficient use of real property resources and land, and provide important planning information for future projects. Master planning at military installations takes place amid continuous changes in existing and forecast conditions. In the case of U.S. Army Garrison Stuttgart, the changes include evolving mission requirements, technological advancements, and changing manpower support mission demands. The small, landlocked physical footprint amplify the impact of these changing demands. For example, Kelley Barracks has less than six hectares of land identified as developable and no land that can be developed without demolition of existing facilities or taking community open space. A compounding challenge is that two of the districts, Kelley and Patch, support multiple Combatant Commands with expanding manning requirements that translate into the need for more facility space and services.

The planning team used a four-day charrette format for developing the U.S. Army Garrison

(See USAG Stuttgart, on page 12)

(Robust Planning, continued from page 9)

planned linear parks for beddown areas in the event of a temporary need for mission success.

Hardening

During the Cold War, hardening was generally limited to critical infrastructure on the assumed front lines. Revetments on airfields were the norm. Unified Facilities Criteria 3-340-01 is now the guide for hardening of key structures needed to withstand conventional weapons effects. Planners should identify not only aboveground structures and aircraft shelters that could benefit from hardening but also key infrastructure nodes where hardening may apply (i.e., power substations, water supply points, wastewater treatment centers, communication hubs and nodes, etc.). There is considerable overlap between hardening and designing for antiterrorism/force protection so planners need to work closely with the applicable subject matter experts to ensure their installation can survive an attack and execute its mission in the most challenging circumstances.

Contingency/Disaster Recovery

When faced with natural or man-made disasters installations need to be able to react and respond quickly to restore critical operations that may have been either completely or partially interrupted A contingency plan or disaster recovery plan is a detailed and structured approach that will allow an installation to continue operations or quickly resume mission-critical functions. This type of planning establishes priorities and recovery time objectives for the installation. One example of such planning is the Contingency Plan for Marine Corps Forces Reserve Headquarters, located in the hurricane prone area of New Orleans. The plan includes fall back/relocation steps as well as identifying key personnel needed to continue operations at a scaled back level.

This is an incomplete listing of issues that plans need to address. The good news is that if planners follow the process and prepare the planning products outlined in Unified Facilities Criteria 2-100-01 (Installation Master Planning), they will position their installations for mission success regardless of the topic of the day emanating from higher headquarters.

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Master planners encounter unique challenges in Europe

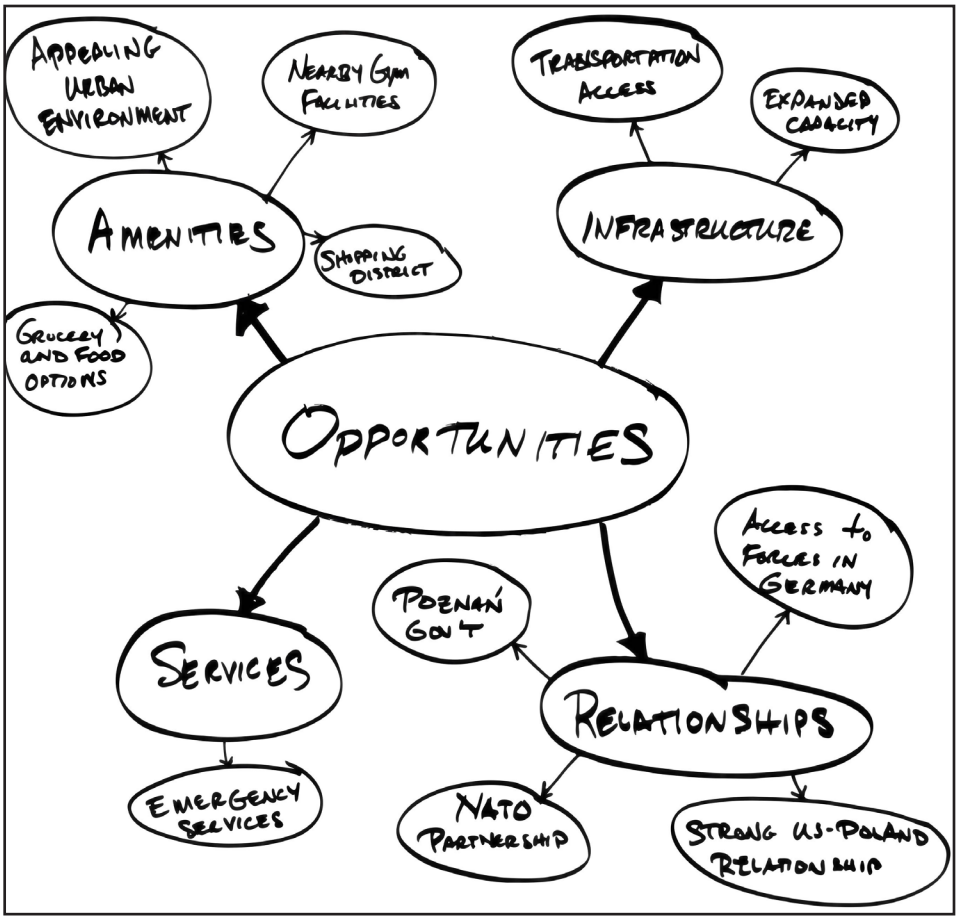
by Nathan J. KentHarber

Much of the military master planning in Europe is through the European Deterrence Initiative. Following Russia's illegal invasion into Ukraine in 2014, the United States authorized the European Deterrence Initiative with nearly $5.2 billion in funding for all military services from 2015 to 2017. The program continues to grow with the 2018 budget request at $4.8 billion, $1.4 billion more than 2017.

Some of that funding goes to maintaining Operation Atlantic Resolve, which demonstrates the U.S. ability to fulfill treaty commitments to NATO. Nearly 7,000 U.S. service members deploy under Operation Atlantic Resolve. While there is no increase to permanent basing of personnel in Europe, the rotational requirement has generated military construction for strategic prepositioning of assets, as well as facility and infrastructure improvements. To support the Army's planned military construction, U.S. Army Europe has partnered with the U.S. Army Corps of Engineers-Europe District to develop master plans for each of the rotational sites throughout Eastern Europe.

The most recent planning effort was an Area Development Plan workshop completed for Bukowska Base Poznań in November. The base will become a Division Command Center forword for Poland. Located in the heart of the city, a metropolitan area of more than 1.4 million people, it is a cultural center and administrative capital of the Great Poland Voivodeship province. Landlocked in a dense urban environment, within a historic district of the city and completely developed area, this location presented unique constraints and challenges in which to develop an Area Development Plan for an Army installation, which is typically located in rural or urban fringe locations with abundant land and few existing facilities.

Through a joint visioning session, using the strengths, weaknesses, opportunities, and threats analysis, "right & blights", and visual



Military and civilian planners and stakeholders work through a Strengths, Weaknesses, Opportunities and Threats analysis as they develop a vision for the Bukowaska Base Poznan which will become tha Division Command Center forward for Poland. (U.S. Army graphic)

preference process, with the Polish military, Polish government officials, U.S. Army Europe staff, and 4th Infantry Division Soldiers, a vision for the installation was developed: "Provide a secure Mission Command Hub in support of combined Polish, U.S., and NATO operations at Bukowska Base Poznańthat effectively uses available facilities and space and preserves the historic character of the setting while maintaining flexibility for future mission needs."

While the constraints mentioned above are typically viewed as weaknesses or threats to a military base, they actually became some of the Installation's greatest strengths, dovetailing nicely into many of the planning principles prescribed in Unified Facilities Criteria 2-100-01, Installation Master Planning. These included compact development (walkability), vertical mixed-use, multi-story construction, energy conservation, facility utilization and building reuse, land preservation, historic preservation, healthy community planning, defensible planning ("eyes on the street"), capacity planning, and network planning. The remaining principles were addressed in the future development plan and identified as future projects in the capital investment strategy.

The military master planning process in an Outside Continental United States, or OCONUS, environment also has the

(See Unique Challenges, on page 13)

(USAG Stuttgart, continued from page 10)

Stuttgart ADP's. The very first activity was to have the planning team and charrette participants walk the planning district together. The one- to two-hour "site survey" allowed everyone to stop at select points to observe, discuss, and photograph installations features and layouts that were useful in planning activities throughout the week. The survey established common points of reference that translated directly into the following two activities: a "Rights and Blights" identification exercise and a Strengths, Weakness, Opportunities, and Threats exercise. Both exercises identified features that work well, seen as positive and should be expanded upon or emulated elsewhere, and those installation features seen less favorably and are targets of opportunity for improvement or potential redevelopment.

These analysis activities led directly into the charrette's central activity – creating district development alternatives. Working in team, charrette participants developed different methods of achieving future end states. Due to major funding constraints, the approach to alternatives was to focus on improvements and enhancements through Sustainment, Restoration and Modernization projects and limit the programming of new projects.

Teams were limited to two new Military Construction projects to achieve their end state. They then presented their work and selected a preferred course of action. The planning team developed Illustrative and Regulating Plans, and ultimately it developed a full submittal, documenting the decisions made during the charrette. The final ADP provides the government the direction and recommended phasing for programming actions.

As part of this endeavor, an Real Property Master Plan Digest, the plan's optional fifth component, was developed for side by side comparison of the short-, mid-, and long-range projects of each of the four primary districts. This allows Master Planners to align scarce funds with the most critical projects to achieve the goals and objectives across the districts.

With the Long Range Component completed, the Garrison will use it to execute current need, program future projects, and shape emerging requirements. The ADP's are an openly communicated, flexible tool used in coordination with the community. Mission Partners and the Master Planners will work as a team to analyze the needs, wants, and developing conditions on an individual basis, determining together how to work with the plan or make the plan work.

Additionally, the Master Planners and U.S. Army Garrison Stuttgart leadership should review the ADPs regularly and update as necessary to validate relevance in coordination with the Mission Partner Facility Managers, and unit leadership. This incorporates current resource constraints and opportunities, changing missions, and evolving environmental, social, and political conditions.

The USAG Stuttgart Area Development Plans provide flexible and adaptable recommendations, priorities, and graphics to frame installation development decision making. It is important that the Garrison and Mission Partner leadership not only use the ADP's on a consistent basis when making planning and development decisions, but that the plans are updated to ensure they remain closely aligned with Garrison goals.

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(Unique Challenges, continued from page 11)

beneficial outcome of fostering international cooperation between the host nation and U.S. personnel. This is especially important at Bukowska Base where the U.S. presence is on a rotational and contingency basis. The Polish government controls and maintains the real property, with U.S. Army as a tenant. This differs from other OCONUS locations, like Germany and Korea, where the land and buildings are managed and maintain by Installation Management Command, making the visioning process all the more important for meeting the future U.S. mission at one of these locations.

Furthermore, the master plan becomes a negation tool for the U.S. and Poland when determining the cost share for the joint facility and infrastructure improvements identified during the planning process. Once approved, it then takes on a fiscal authority often not seen in the U.S. It becomes a basis to pitch for U.S. construction dollars as well as Polish Zlotys and NATO Euros.

In the end, the Bukowska Base Poznań master plan identified more than 46 projects, which successfully lays out the infrastructure programs for the U.S. and Poland during the next 20 years. Determining how this program will be divided between the governments will be agreed to during the master plan approval process.

Following the approval of the Bukowska Base Area Development Plan, the next phase for Poznań will be further developing of these programs through the planning charrette process, which will result in executable DD Form 1391 programming documents.

There are more Area Development Plans on the horizon for Poland and other parts of Europe, each with unique and interesting challenges and opportunities. Certainly there will be planning lessons learned from each of these bases, especially Poznań, that could be applied to military installations in the United States. (particularly where urban encroachment is occurring).

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Themes and Deadlines

2018-19 Themes and Deadlines Schedule

April-May-June 2018:
Environment and Sustainability
Deadline: March 2, 2018

July-August-September 2018:
Operations and Maintenance
Deadline: June 1, 2018

October-November-December 2018:
Energy, Water and Waste
Deadline: Aug. 31, 2018

January-February–March 2019:
Master Planning, Barracks and Housing
Deadline: Nov. 30, 2018

The installation of the future: Learning from one of the past

by Linda Barnett, John Burgess and Mark Gillem

U.S. Army Garrison Miami opened for operations in 1997 primarily to support U.S. Southern Command in Doral, Florida – just west of downtown Miami. The planning idea was clear – provide a 55-acre mission campus for SOUTHCOM's administrative and primary support functions only (e.g. warehousing, fitness center, and a small food court with minimal retail). The local community would provide for most other functions normally associated with a garrison from housing to grocery shopping. This resulted in one example of a "base of the future" where the military site handled the direct mission needs and everything else went "off-base."

The argument was compelling. Why should the military replicate services that could be found outside the fence? The capital and on-going maintenance costs for these functions could be "off-book" and allow the garrison to focus on direct mission support.

While interesting in theory, in practice the creation of what is essentially a military office park has not been well-received by the command's leadership. From a mission resiliency perspective, with no housing on the installation, the ongoing operation of the mission in an acute threat scenario (think hurricanes or floods) relied on the hope that staff could always get to the garrison. But in a worst-case hurricane scenario, access to the garrison across flooded-out roads from far-flung subdivisions would be impossible.

Additionally, the simple cost of housing in the Miami metro creates significant challenges for most military personnel. When the initial rent, for example, includes the first and last month plus a security deposit, this could easily total more than $7,000. Not many Soldiers have that kind of money readily available. While the housing allowance ultimately covers housing costs, given the tight housing market in Miami, the total monthly housing bill to the taxpayer is extraordinarily high.

To address these issues, the planning team looked to installations of the past where planners placed mission facilities within walking distance of homes, shops, and recreation areas – picture historic Fort Sill in Oklahoma, Joint Base Lewis-McChord in Washington, or Fort Leavenworth, Kansas. To create the plan, stakeholders from the installation and local community participated in a multi-day Area Development Planning charrette that was followed by the creation of detailed Customer Concept Documents and DD Form 1391s for three facilities – a new support facility, single family townhomes, and unaccompanied personnel housing.

Family housing at USAG Miami follows the South Florida contemporary vernacular for single family homes (top) and townhomes (bottom). (Image courtesy of The Urban Collaborative, LLC.)

The support facility is a short-term need so the team sited it in the most convenient spot adjacent to the existing support facility. The team used planning strategies outlined in Unified Facilities Criteria 2-100-01 (Installation Master Planning) and sited the housing neighborhoods in walkable layouts that could be phased over time to meet the Housing Market Analysis requirement of 142 family homes and 221 unaccompanied rooms and later to support any potential capacity needs.

The team also prepared a detailed Business Case to analyze three different funding strategies:

MILCON: In the Military Construction model, the installation would use Congressionally appropriated funds to pay for the construction, operations, management, and maintenance of the development. This is the traditional model that is rarely used today for housing, due to the heavy upfront taxpayer investment required. However, in this case, this is currently the most attractive course of action given that it is a known process.

RCI: The Residential Communities Initiative has been widely used on military bases but the authority to use this model has not been approved for U.S. Army Garrison Miami. If the authority could be approved, then this model would leverage the Basic Allowance for Housing to access the private capital market to fund construction and maintenance without Congressionally appropriated funds. However, to work, the current housing allowance would need to increase by 64 percent, which makes this course of action unrealistic.

EUL: In an Enhanced Use Lease (EUL) scenario, by using the income stream from the assigned personnel's existing housing allowance and additional income from private development

(See Learning from the past, on page 15)

Mixing compatible uses for mission effectiveness, flexibility

by Linda Barnett, Matt Fortunato and Mark Gillem

The top two images on the cover of this edition of *Public Works Digest* are for a mixed-use consolidated mission support building at U.S. Army Garrison Miami, Doral, Florida. Mission buildings come in many shapes and sizes and seemingly endless Category Codes but some of the most common mission uses filling these buildings fall into two primary typologies: high ceiling/open bay logistics buildings or normal ceiling/small bay administrative or training buildings.

When looking back at the military's historic stock of mission buildings, it is revealing to see that these two building typologies remain viable nearly a century later. The narrow wing office and classroom buildings at Fort Sill in Oklah0ma, Joint Base Pearl Harbor-Hickam in Hawaii, and Joint Base Lewis-McChord in Washington have been repurposed many times but still work today. Similarly, the historic warehouses and maintenance facilities at these same installations have endured many reconfigurations and mission changes. Their flexibility is largely due to simple plans with efficient structural bays and easy access to natural light either through narrow wings or top lighting.

This lesson informed the plan for the new consolidated support building at USAG Miami. The plan was developed under contract to the U.S. Army Corps of Engineers Mobile District as part of a Customer Concept Document that included programming, site analysis, floor plans, elevations, sections, systems narratives, cost estimates, Leadership in Energy and Environmental Design framing, energy modeling, stormwater forecasting, and development of the full DD Form 1391. The design conformed to the installation's Regulating Plan and Planning Standards.

The 54,000-square foot project is split into two main components that represent the different core functions of the building – the logistics space and the administrative wing for the installation's Logistics Readiness Center. The new building is connected to an existing mixed-use mission building that houses garrison administrative functions, a logistics warehouse, and a fitness center.

The new logistics space consists of high bay storage and marshalling areas that allow for consolidation of existing warehouse assets currently located outside the fenceline. In fact, the building will allow the installation to move out of 47,500 square feet of warehouse leases that have significant cost, access, and security concerns. Internal differentiation will be provided by cages to separate and secure various bulk goods from a variety of organizations. The plan's structural system is integrated to maximize storage area efficiencies.

The three-story administrative wings wrap around the warehouse space in the shape of an "L". The administrative wings support two separate organizations, each with their own entry, and are designed with a narrow footprint to aid in passive cooling and heating and to act as a visual buffer, screening the less attractive industrial and storage functions. All users have direct visual access to a window – in many cases from two sides due to compatible building heights of the various uses. The narrow wings of the administrative building not only create opportunities for natural light and passive ventilation, but also allow for maximum flexibility if the building occupants change in the future. Minimal private offices as well as open floor layouts support the flexible use of space. The thick walls, deep set windows, and large overhangs allow energy demand reduction by minimizing the amount of unwanted solar heat gain in the summer months. Large and flexible rooms shared between several organizations, such as conference rooms, bathrooms, and breakrooms, increase the efficient use of space and limit wasted capacity of many smaller, less used rooms within individual sections.

Energy modeling for the building identified a 46 percent reduction in projected annual energy consumption and roof-mounted photovoltaic panels could generate the remaining energy needed so that the building can generate as much energy as it uses over the course of a year – making it net zero for energy. For stormwater, bioretention and passive irrigation systems capture all the projected stormwater runoff on the small site.

By combining compatible uses in one building and going vertical for administrative uses, the land area required dropped considerably. This also reduced the need for separate stand-off zones, multiple utility laterals, and separate parking areas. Perhaps more importantly, the compact nature of the plan supports more efficient productivity – building occupants can now walk across the hall rather than drive across town to conduct shared missions. As needs change, the building's built-in adaptability will allow for easy reconfiguration. After all, the storage area could become a maintenance facility or the admin functions may convert to training missions.

This is just one example of a programmed building that, through good design, can support energy efficiency, low impact development, footprint reduction, infrastructure reset, and resiliency. The possibilities are endless and the flexibility supports mission effectiveness now and long in to the future."

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(Learning from the past, continued from page 14)

on a portion of the identified site, all housing and community support functions could be built and maintained without Congressionally appropriated funds. The project would provide very attractive returns to the development partner. To do this, however, a separate approval would be needed and the timing may not support an EUL.

In the end, this project demonstrates how planning strategies employed on installations of the past can inform a new view of bases of the future – ones largely built using a variety of funding streams but organized in a way that creates a strong and resilient military community.

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Integrating historic preservation, mission through master planning

by Joseph Murphey and Lyndsey Deaton

As installations mature and mission requirements advance, leaders face seemingly competing priorities: comply with historic preservation laws or meet current and future mission requirements? The dilemma of preserving the past or supporting the future is examined through two diverse case studies of Army medical buildings that illustrate how planners can support historic preservation rather than compete with current mission needs and contribute to a sustainable and resilient installation.

Tripler Army Medical Center is located near the top the Moanalua ridge overlooking Honolulu, Hawaii. Designed in the Moderne architectural style, the Army completed the massive hospital in July 1948 at a cost of $41 million. The public can see the Tripler complex for miles around; it is legendary for its signature coral pink color–an important feature of its original construction that continues to convey its legacy. The rolling landscape of the Moanalua ridge, combined with the distinctive architecture of the hospital complex, has become an iconic symbol of the military presence on the island.

Located farther down Moanalua ridge from the enormous main hospital, Building 40 is a much smaller coral pink structure in the same architectural style, which served as the first psychiatric center in the Army through the late 1970s. After a major renovation to the main hospital in 1985, Tripler became one of the largest and most modern facilities in the military. However, Building 40 remained an architectural time capsule of narrow corridors and small patient cells that was ill-equipped to meet the evolving mission needs, which had changed from a psychiatric facility to a drug testing laboratory.

Today, Tripler continues to work toward the goal of becoming the premier health care system in the Pacific Basin. Tripler's partnerships with all branches of the military and the Department of Veterans Affairs continue to make the hospital the prominent provider of health care for America's fighting men and women across the Pacific. Both the distinct architecture and the landscape

Building 40 at Tripler Army Medical Center, Oahu, Hawaii, is important to the overall story of military medicine for its architectural sysle and associations with military psychiatry, but needed a major conversion to remain a useful part of the medical center. (Photo by Joseph Murphey)

convey the story of military medicine but as medicine advances, so too do the architectural needs of the facilities. How did planners decide what to preserve and what to develop on an installation constrained by urban encroachment?

They did this through stakeholder input and information from the Installation Cultural Resources Management Plan. Through an on-site workshop consisting of hands-on sessions that focused on site analysis, vision and goals creation, and five alternative plans, interdisciplinary stakeholders laid the critical groundwork for the Area Development Plan for the Tripler Army Medical Center District.

They prioritized historic features and landscapes by criteria developed specifically for the installation based on the important people, places, and events that occurred at Tripler. Then, they compared the list with mission requirements and projections for future growth. Their focus ensures that the remaining collective of historic features and landscapes can tell Tripler's unique story.

Leaders identified Building 40 as important to the overall story of military medicine for its architectural style and associations with military psychiatry - yet the outdated utility infrastructure and building program limited the adaptability of the architecture. Working with the local State Historic Preservation Office, we retained the entire exterior facades and select architectural features such as the stairs, period clocks, and some wall surfaces and doors. Ultimately, planners converted Building 40 from a psychiatric center into a modern drug-testing laboratory through preservation of the exterior façade with major interior renovation.

Flying across the Pacific and the North American continent to the east coast, Fort McNair is a consolidated installation with several layers of important historic events, people, and places just outside of Washington, District of Columbia. The installation began as an arsenal and grew to envelop a penitentiary where the Lincoln assassination conspirators were tried and hanged.

A two-building Second Empire style general hospital was built on the post in the 1880s that proved instrumental in the history of medicine. Major Walter Reed found the area's marshland excellent for his research on malaria, which he conducted in Building 58 of the hospital. Reed's pioneering work identified mosquitoes as the vector for the transmission of Yellow Fever. Building 58 is significant for its architectural style and its association with Reed and his impact of eradicating Yellow Fever.

Yet, at the turn of the 20th century McKim Meade and White, urban planners and architects, developed a comprehensive installation master plan that called for the

(See Historic Preservation, on page 17)

(Historic Preservation, continued from page 16)

installation to be wiped clean of many of these historic places in order to accommodate new concepts such as the City Beautiful Movement, which emphasized monumental architecture and large, planned open spaces. At the time, many viewed the crowded and non-uniform relics of our past as "weighing down" progress and contrary to the image of a military reflecting America's emerging power at the dawn of the 20th century.

Due to mission needs that required the continuous use of the hospital complex, the McKim Meade and White plan was never executed in its entirety. Building 58 (the building where the Lincoln conspirators were tried) and several other historic structures survived the "historical clean up." Planners repurposed Building 58 into a dispensary, which eventually evolved into a health center. By 2015, the historic building no longer met many code requirements and could no longer function unless mission needs were met.

Working with the D.C. State Historic Preservation Office, the Commission on Fine Arts, and the National Capital Planning Commission, stakeholders were able to identify which historic building features to retain and which to remove. Modern egress code required a stair tower. Architects situated the tower at the rear of the building where visibility did not impact the most visible facades. A plaza with interpretive materials explaining the association with the work of Major Reed connects the two former hospital buildings.

By making use of the existing building infrastructure, Fort McNair has sustainably advanced to meet current mission needs. It made fiscal sense to the installation leadership to make use of historic structures and be responsible stewards of history. Through adaptive reuse, Fort McNair has continued to serve Soldiers and families while allowing its infrastructure to tell the story of military medicine.

Every year, more buildings and landscapes will become eligible for consideration for placement on the National Register of Historic Places. Historic preservation and the mission is not an either/or dilemma. Both can be accomplished through the installation master planning process.

Planning teams should identify historic elements and prioritize these elements when they are essential to convey the importance of a structure and its ability to tell its story. In this way, our installations will sustain and support our current and future mission requirements with a context of our share histories.

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The "before" and "after" of Building 58 at Fort McNair, Virginia, just outside of Washington, District of Columbia – shown as it was in 1925, and as it appears now. The building was the site of much of the pioneering work done by Major Walter Reed in eradicating Yellow Fever. The building has been revamped while maintaining many of its historic features. (Historical photo courtesy of the U.S. Army Corps of Engineers Fort Worth District and Joseph Murphey)

The Regulating Plan: Unsung hero of the Master Plan

by Rachael Richter

There are many ways to implement the Master Plan. One essential component of the master plan that is invaluable to guide implementation is the regulating plan. While not very clearly understood, a regulating plan along with the illustrative plan are the keys to a long-lasting master plan.

It is very easy to get wrapped up in holistic design of the illustrative plans, which defines a scenario for maximum area development during a long-term period of time. While these illustrative plans are great in defining the long-term capacity for an area; near-term actions involving rapidly changing projects and requirements can result in complex planning actions requiring detailed siting issues and endless revisions. The complementary regulating plan is the specific overarching permitted planning standards for each building parcel/siting in the area.

The Regulating Plan describes both the broad range of possible land uses and defines building form (e.g. height and frontage for each parcel). It gives an installation the flexibility to make that concept illustrative plan come to life. A primary goal of Unified Facilities Criteria 2-100-01 was to make master planning more agile and flexible. The regulating plan is the key tool to make that happen.

The regulating plan is more than just a land use plan. As a form-based code, it is inspired by zoning ordinances used by local communities. Zoning defines what can go where and how it should look – setbacks from roads, minimum and maximum heights, desired parking areas, building scale, etc. Carefully considering the allowable uses, preferably with a mix of complementary uses, gives planners flexibility in implementing the master plan. The regulating plan strives to balance form and function.

The Master Planning Unified Facilities Criteria brings a renewed focus on the physical design of the installations. A physical design that responds to principles of compact development and preservation of land, while respecting the planning principles of resilient installations today and tomorrow. The criteria describes the planning methodology that assures compliance with Federal guidelines as well DOD and Service policies.

The same analogy follows the real property master plan. From the planning vision, goals, and objectives, a real property master plan is created. It is framed around solid comprehensive area development plans that holistically portray an installation's long-term development plan. The regulating plan is the detailed implementation standards that must be followed to meet the principles of the real property master plan. It provides plan provides the "teeth" for the master plan. It is the policy that implements the master plan. Not visual, but very effective when well-crafted.

Headquarters Installation Management Command uses the regulating plan to evaluate projects for compliance with the master plan, and the Office of the Assistant Chief of Staff for Installation Management also uses it to evaluate projects as part of its funding review.

Take the South Post District at Fort Wainwright, Alaska. The district is the heart of Fort Wainwright, housing the day-to-day Soldier and community activities. The plan envisions complementary mission uses collocated with community and Soldier support uses. By focusing these uses in a compact center, more space is freed up for close-in training, relieving pressure on the ranges.

The illustrated plan shows it graphically, but the real teeth comes with the regulating plan. Creating a row of motor pools consolidates mission uses closer in, reducing transit time and preserving space for training uses on the edges of the district, near the ranges. These motor pools were notionally identified in the capacity plan but were not required at the time of development. Just one year later, a requirement has been identified. The first place the master planners turned to for siting was the regulating plan. As shown, the "zone" of industrial and motor pool uses is well defined in the regulating plan and implements the vision of the South Post District.

Fort Wainwright also pioneered the use of the regulating plan in governing how cell phone towers are sited on the installation. The Directorate of Public Works was getting numerous requests from communications companies to site towers across the installation and there was little existing guidance on how to handle these requests. So, the regulating plan was used to denote which "zones" were appropriate for commercial communication towers. This provided a rational and clear basis for handling requests. During the development of the regulating plan, the master planners worked to balance the need for communication while preserving the aesthetic environment and voiding visual clutter.

At Fort Bragg, North Carolina, the regulating plan is used as a clear and succinct briefing tool for leadership on the status and goals of the master plan. To bring the incoming Garrison Commander up-to-speed on the status of the master plan, the installation master planners produced an installation-wide regulating plan, for all districts completed to date. This plan is a powerful visual for the Garrison Commander, communicating the in-depth planning that Directors of Public Works and the stakeholders have done and continue to do.

It is imperative that as projects evolve into programming (i.e., DD form 1391 documentation, and planning charrettes), that the regulating plan is referenced and explicitly described as essential siting criteria. If designers understand the planning criteria early, they can offer design solutions that comply. Having the site approved having the site approved in accordance with the master plan means that the siting complies with the form base code. It means the building use, building setback and parking rules are compliant as well as the appropriate planning standards for landscaping and transportation standards.

Without the emphasis on the regulating plan, a master plan can quickly become outdated, requiring costly and time-consuming updates. Maintaining the regulating plan allows the Directorate of Public Works team to stay focused on the long-range vision and work projects day-by-day.

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3P's provide challenges for planning in National Capital Region

by Ian Frank and Kevin Cooper

In updating the Real Property Master Plan for Joint Base Myer-Henderson Hall, or JBM-HH, its mission uniqueness and physical location played an integral part in its coordination and outcome. The installation encompasses Fort Myer in Arlington, Virginia, and Fort McNair in Washington, District of Columbia. The update provided master planners an opportunity to look at the site specific 3P's – purpose, product and process.

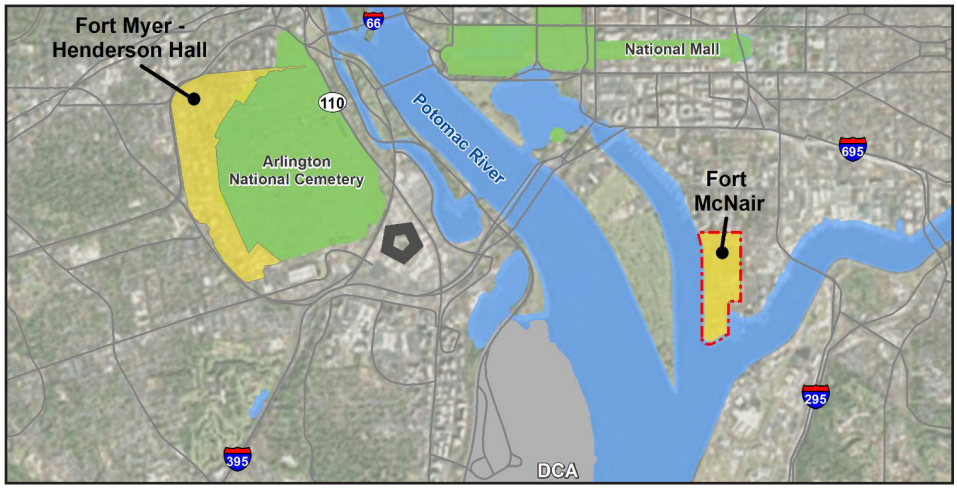
Purpose:

Although the product and process will vary significantly from those of other installations, the Real Property Master Plan update purpose is a constant — delivering a 20-year, sustainable, mission ready plan based on our site-specific Vision Plan via a stakeholder collaborative process. The installation's Real Property Master Plan update will incorporate new paradigms geared to effectively respond to and mitigate the morph in our economic, geo-political, climatological, and demographic environment to better ensure sustainability as an enduring, strong mission ready force. As a Garrison within the Nation Capital Region, there are additional collaborations with District of Columbia- area governing agencies such as National Capital Planning Commission. D.C. Historic Preservation Office, and other governing agencies, mandating additional layers of consideration and approval authority coordination. Any one of these factors, along with retrofitting any new program within a traditionally status quo enterprise, poses a challenging task and process.

Product and Process:

Site context, i.e., site specificity, is what makes JBM-HH unique from others, and this is reflected in the Real Property Master Plan. Our top uniqueness factor considerations include our location with the region, our prominent historic sites and legacy, our shoreline marine setting, and adjacency to Arlington National Cemetery, as well as being the site of nationally prominent tenants such as National Defense University and Military District of Washington, along with several iconic ceremonial missions. Having as complete an understanding of these unique tenancies as early as possible better equips us to respond to their needs.

Early engagement with stakeholders was key to the update process success with dialogue among the various agencies continuing throughout the update process. Three of the five Master Planning components (i.e., the Vision Plan, Installation Planning Standards, and two Area Development Plans) have been completed in stakeholder collaborative settings, aimed at planning our 20-year sustainable "roadmap" for the installation's future development.



The following categories summarize the uniqueness factors, which were essential parameters used in crafting planning strategies:

- Contextual Uniqueness Factors: Representing time, space, and place. Time factors included heightened terrorist activity and current related risks in the region; current shrinking budgets; site lines, relative to current boundaries of our historic districts and their contributing buildings and sites; and 2005 Base Realignment and Closure Act consolidation of our installation. Space Factors included shrinking boundaries and garrison size; historic sight lines and height restriction constraints. And Place Factors included location within the National Capital Region; iconic historic garrison on the National Register; shoreline location on a point at the confluence of two rivers and a channel; location in the Nation's Capital; adjacency to Arlington National Cemetery; development limitations due to adjacent Anti-Terrorism Force Protection structures related to urbanization expansion; unusual topographic condition of hills and valleys at Fort Myer-Henderson Hall; and, flood prone topography and marine seawall security issues at Fort McNair, exacerbated by adjacent expanding development.

Product Impact: Short-, mid-, and long-term impacts were identified along with constraints in horizontal and vertical expansion and corresponding sustainable mitigations and alternatives.

Process Impact: Vision and Area Development Plan charrettes were the interactive collaborative vehicles for stakeholders and planning teams to identify constraints and opportunities via on-site surveys with subsequent vetting; collaborative charrette teams exercises that categorized and prioritized findings; various National Capital Region agency attendance and Garrison tenant representatives' input were the primary content sources used in the draft, vetting and final Vision Plan and Area Development Plans.

- Approval Authorities and Collaboration Uniqueness Factors: National Capital Region agencies and the various tenancy representatives ensured that the Real Property Master Plan update was stakeholder collaborative so the installations' systems connected with comprehensive National Capital Region planning initiatives, including the major South Washington Urban Development project adjacent to Fort McNair.

Product Impact: Connectivity with external urbanization and neighborhood area development planning; mitigations and planning required to respond to those external developments, including increased risks due to significant growth of adjacent population and vehicular traffic due to the District of Columbia South Washington development in housing, retail, and recreation, and sports

(See Challenges for Planning, on page 20)

Stakeholder engagement necessary for effective ADP's

by Madeleine Fincham and Rachael Richter

A major struggle we hear about from master planners is stakeholder engagement. How do we get the message out about how important it is for stakeholders to participate in the planning process, particularly the Area Development Plans, or ADP's? And not just participate but be actively and enthusiastically part of the process? How do we get stakeholders to pause from their busy days to truly engage?

Three installations have had remarkable success in engaging their stakeholders – Fort Bragg, North Carolina; Fort Stewart, Georgia; and Fort Campbell, Kentucky. Each takes a slightly different approach based on its stakeholders and what works internally to grab their attention.

Prior to the ADP

Each installation uses operation orders, or OPORDs, to task stakeholders, although in many cases there are competing messages and OPORDs. Both Fort Bragg and Fort Stewart have developed a clear messaging strategy – through their OPORDs, emails, and interactions. They have specific and clear language in their OPORDs – why does it matter, where is it, how long is it, and who needs to be there?

Also, the OPORD, the master planners often send out Outlook calendar appointments. Simple and appealing flyers are physically placed around the affected planning district to garner attention from a wider range of stakeholders beside those tasked by the OPORD.

Amanda Gill, who works in the Fort Campbell, Kentucky, Directorate of Public Works Environmental Archaeology section, provides a history of "Gravel Gertie" and its importance as a historic focal point within the installation's Clarksville Base District. (U.S. Army Photo)

Fort Bragg and Fort Stewart have found that direct communication also is very effective. Their

(See ADP Stakeholder, on page 22)

(Challenges for Planning, continued from page 19

stadium; connectivity to District of Columbia Comprehensive Plan related to flood mitigation initiatives and natural shoreline developments.

Process Impact: Representation by National Capital Region agencies in planning charrettes ensured their input and response to above developments. Attendance by those participants as well as tenant representation and input as formidable participants in the process will facilitate their concurrence and approvals.

- Mission Related Uniqueness Factors: Major tenants such as the National Defense University, The U.S. Army Band, and 30 other tenants and partners have missions that include National Capital Region defense, ceremonial performances, and post graduate education.

Product Impact: Early recognition of constrained growth and continuation of dominant presence and influence at the Garrison that would need to be reflected equitably in the Real Property Master Plan.

Process Impact: Importance of that representation as primary stakeholders; ensure that all understand the Unified Facilities Criteria to principals to keep all on the "same page".

- Notional Uniqueness Factors: Represent zoning parameters to determine limitations and opportunities for future developments; placeholders represent the form based principles of zoning that enable capacity planning, all in conformance with the Vision Plan.

Product Impact: Represent notional building, regulating plans that indicate capacity planning within the parameters of the Area Development Plan, and Installation Planning Standards, as well as reinforcing connectivity and synergies with National Capital Region comprehensive master plans.

Process Impact: Continued National Capital Region and tenant representation and coordination with JBM-HH.

By adhering to the resilient long-term vision, by continuing to practice responsible stewardship of the valuable unique assets, missions, and human capital, and through vigorous stakeholder collaborations, JBM-HH can continue to ensure sustainability as a good neighbor and as a mission ready effective U.S. Army installation.

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Engaging the public, understanding the site create useful plans

by Mark Gillem

Imagine working from master plans that are more than four decades old. Identifying current or future projects would not be very fruitful. Relying on maps and plans from those aged documents would be counterproductive. And extracting relevant principles or strategies from the text would provide incomplete and most likely out-of-date guidance at best.

Fortunately, the U.S. Army Corps of Engineers Portland District has embarked on a program to update master plans for Corps-managed recreation and natural and cultural resource areas. Some of these plans date back to the 1970s. Like their military program counterparts, civil works planners know the value of planning and are investing in creating plans that can help them meet their stakeholders' varied needs. The best processes are integrating the master plans and programmatic environmental assessments through comprehensive efforts to make managing these resources more effective and efficient.

There are three key elements of the processes used to update master plans for civil works projects. Those responsible for master planning at military installations may notice significant overlap. Regional master plans typically replace individual project master plans. As such, a regional master plan is similar to the installation development plan at a military installation and specific plans for each area found within the region are like area development plans for districts within an installation. By thinking both regionally and locally, the master plan can be effective across multiple scales. It is also essential that planners at military installations near Corps of Engineers-managed lands understand the Corps of Engineers planning process so they can engage appropriately.

Public Engagement

When planning regionally, stakeholder engagement is vital. For most Corps of Engineers regional master plan projects, planners should always engage three types of stakeholders. First, government-to-government engagement is critical when Native American tribes are involved. This typically requires a formal and respectful outreach process to determine the tribes' level of interest and preferred methods of engagement. Second, interagency engagement is essential since Corps of Engineers lands often border multiple jurisdictions. This may require coordination with the U.S. Forest Service, the Department of Defense, Bureau of Land Management, the National Park Service, as well as applicable state, county, and local governments. In many cases, the Corps of Engineers may authorize other agencies to access its property for day-to-day management and such plans need to be captured. Third, members of the general public need an opportunity to weigh in as individuals or as representatives of affinity groups (e.g. recreational associations, environmental interest groups, and resource use groups).

The administration building is within the Bonneville Dam Historic District and is one of many historic and cultural resources that the master planning process addresses.
(Photo courtesy of The Urban Collaborative, LLC)

Stakeholder engagement requires a process sometimes referred to as triangulation. Trying to find a clear direction using just one or two data points frequently results in failure. With three or more data points, however, a direction is more easily identified. Planners should combine interviews, focus groups, formal presentations, websites, social media, archival research and field investigations to gather the needed information. Actual plans (drawings made to scale that show the desired relationships over time between land uses, transportation networks, historic sites, habitat zones, recreation sites and operational areas) are best made through a collaborative process where appropriate stakeholders spend time together on charrette working through alternatives and developing a preferred alternative for the areas.

Each stakeholder group may participate in different ways. For instance, tribes may be involved through formal meetings, other government agencies may participate in detailed planning charrettes, and the general public may be involved in scoping and review workshops. Each project has its own stakeholder context and a robust yet realistic engagement plan is vital to shaping a successful project.

Site Analysis

In terms of regional planning, Corps of Engineers parcels typically cover large habitat and recreational areas. Portland District, for instance, encompasses several reservoirs impounded by dams in close proximity to one another. The Mid-Columbia region, for example, includes Bonneville (last Master Plan update in 1997), The Dalles (last Master Plan update in 1975); John Day (last Master Plan update in 1976) and Willow Creek (last Master Plan update in 1976). The Rogue River basin includes Applegate (last Master Plan update in 1978), Elk Creek (last Master Plan update in 2012) and Lost Creek Lake / William L. Jess (last Master Plan update in 1974). The site analysis process should cover all land classification areas, looking broadly across the region and narrowly at individual units, to identify relevant projects needed to meet mission and regulatory needs.

(See Engaging the Public, on page 22)

(ADP Stakeholder, continued from page 20)

Garrison Commanders make announcements at Real Property Planning Board meetings and during routine meetings with senior leaders around the garrison, communicating the importance of the planning effort. In addition, the master planners call the key stakeholders to get their commitment to attend the ADP workshop so their voices can be heard.

During the ADP

Once you get the stakeholders to the workshop, there are many ways to keep them engaged and use their time wisely.

Fort Campbell has experimented with several different ways to maintain interest and engagement. Stakeholders perform a "field walk" to discuss the current conditions of the affected planning district. The master planning team tasks key stakeholders with leading walking or driving tours of their facilities and complexes to speak to the background, assets, needs, and future district projects.

For example, the Clarksville Base District ADP considered significant historic and environmental constraints while ensuring the Preferred Alternative could execute mission and operations efficiently with room to grow. This necessitated the input from various stakeholders including: Directorate of Public Works Environmental Archaeology providing a photographic overview of the District's history, archaeological and environmental survey areas, and historical structures that should remain; and Soldiers of the 160th Special Operations Aviation Regiment, 52nd Explosive Ordnance Disposal, and the NCO Academy briefing stakeholders of the requirements, assets, and future projects within their complexes and facilities.

Fort Stewart also takes a similar approach as Fort Campbell by identifying subject matter experts. These experts actively participate throughout the workshop, and are particularly helpful during the site tour and development of alternatives, to add depth to the stakeholder's discussions.

These installations have found innovative new ways to structure the workshop agenda to make better use of stakeholders' time. Many typical ADP's require stakeholders to be present for essentially 35 hours of their work week, a major strain on resources. By collecting regular feedback from their stakeholders, these installations have experimented with shorter, more effective ADP workshops. The goal is to bring the right stakeholders to the table, collect their insights and knowledge, and then allow the consultant team to build on that knowledge. Through this collaboration, Forts Bragg, Campbell, and Stewart now successfully host ADP workshops that bring more than 50 stakeholders to the table throughout a much shorter workshop week.

After the ADP

Fort Stewart keeps the spirit of in-person collaboration alive during the review of the ADP report. For the Hunter Army Airfield ADP, Fort Stewart's master planner invited all stakeholders who attended the ADP workshop to meet again and review the plan together. They printed large scale versions of the preferred alternative plan and hung them on the wall of the meeting room, encouraging stakeholders to inspect closely and physically mark up with suggestions. These maps were almost 8 feet tall and spanned most of the room – creating an immersive review experience!

Fort Bragg recently tried a similar approach by holding an in-person stakeholder review meeting with good results. The in-person review meeting kept the momentum and interest going among stakeholders. While it requires a little bit more time investment from stakeholders, it provides for continued collaboration and allows comments to be de-conflicted and thoroughly discussed.

Fostering this collaboration also continues to pay dividends well into the future. These stakeholders will be more likely to participate in future planning activities after seeing how their contributions are recognized and valued.

We also have found that sending out workshop summary to stakeholders shortly after the ADP workshop ends supports continued engagement. This summary can be created quickly using photos of the workshop drawings. Providing this summary allows stakeholders to communicate up their chains of commands and keeps them involved while the full plan is prepared.

These are just a few examples of stakeholder engagement. A common theme among Fort Bragg, Fort Campbell, and Fort Stewart is the willingness of their master planners to experiment to find the approach that works best for their stakeholders. They each actively listened to the concerns of their stakeholders and then adjusted course.

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(Engaging the Public, continued from page 21)

Planning

For civil works projects, the operational management plan is the playbook for the operations project manager and the natural resource manager. The ideal operational management plan covers policies and procedures while outlining projects needed to meet the goals and objectives detailed in the master plan. These goals may include identifying best management practices as well as opportunities for appropriate outdoor recreation and environmental stewardship. The operational management plan should flow from a comprehensive master plan. Without the latter, the former can only be partial and premature.

To create an effective master plan for any Corps of Engineers civil works site, planners must use an appropriate public engagement process, conduct a comprehensive site analysis, and do actual planning. The result is a useful, living master plan.

Editor's Note: *For more specific process guidance, please see USACE Engineering Pamphlet 1130-2-550.*

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Explosives safety adds dynamic element to Crane's master planning

by Lauren Shipman

Master planners for the Army Organic Industrial Base, consisting of ammunition manufacturing arsenals and storage depots, must account for land use constraints not typically encountered in installation planning. Many times explosives safety considerations have a larger impact on future site development than environmental, utility, topographic and other classic constraints.

In southern Indiana, Crane Army Ammunition Activity (CAAA) is improving explosives safety site planning strategies to ensure continued mission readiness.

Crane Army, a tenant aboard Naval Support Activity Crane, occupies 4.8 million square feet of facilities and approximately 80 percent of the installation's nearly 100 square miles. To account for the Army's missions and priorities on a Navy base, CAAA is creating Area Development Plans for its operational areas of the installation in collaboration with Navy stakeholders. These plans are being incorporated into the host's Installation Development Plan for use in base-wide master planning.

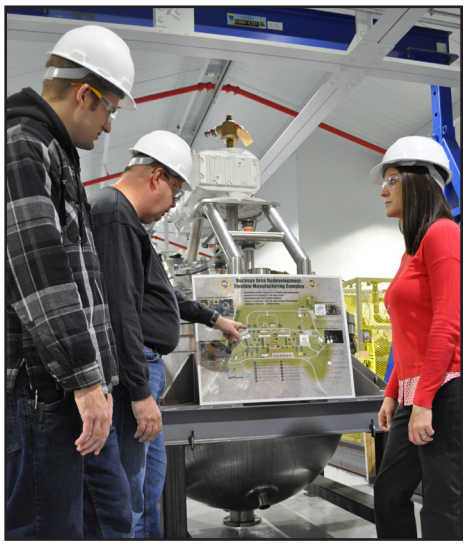
With missions including storing, demilitarizing and manufacturing conventional ammunition, missiles and related components, explosive safety is a significant driver in all CAAA master planning decisions. Crane Army's facilities staff work continuously with manufacturing engineers, building users and safety personnel to ensure explosives safety regulations are being met while also optimizing the flexibility of Army missions.

Placing new infrastructure within explosive operating areas as well as officially site approving grandfathered World War II-era ammunition facilities in compliance with explosives safety regulations requires careful planning. Each ammunition production or storage facility has an associated imaginary explosive arc that determines the minimum safe distance other structures, roads and utility systems must be located from the ammunition facility. These explosive arcs, also called explosive safety quantity-distances, are determined by the type and net explosive weight of the munitions used within each facility. Maintaining these distances between facilities ensures non-mission essential personnel are not unnecessarily exposed to explosive hazards and prevents propagation to other ammunition facilities in the event of an explosives incident.

These explosive arcs from each ammunition production and storage facility become thousands of land use constraints for Crane master planners. To mitigate effects to Army readiness, Crane has employed a situational safety site planning strategy to account for multiple operational circumstances. This strategy allows CAAA to obtain explosives safety site approvals for likely future scenarios within their operational areas of the installation.

In a manufacturing complex with multiple production facilities, Crane planners recently developed a site plan that allows maximum net explosives weights in an individual facility to ebb and flow depending on the mission requirements in nearby production facilities. When one production facility has a high net explosive weight workload requirement, CAAA can reduce the net explosive weight in nearby facilities to meet mission requirements. In another master plan, a complex of facilities is planned to be sited as a continuous operational line connected by tunnels with an alternate option for each of the facilities to operate independently. The flexible approach to site planning gives CAAA the capability to efficiently change operations within production facilities as mission dictates.

Automated Explosive Safety Siting software recently developed by the Department of Defense Explosives Safety Board has become a valuable tool in master planning efforts. The Geographic Information System software allows Crane planners to quickly run various operational scenarios in a program that overlays explosive arcs and any associated criteria violations onto aerial imagery. The software also automates quantity-distance calculations, maps and reports that were previously required to be completed manually when developing explosive safety site approval request packages. Automated software will allow Crane to expeditiously and officially site approve existing ammunition facilities that have been previously grandfathered with explosive safety boards.



Crane Army facility and production engineers review an area development plan during the renovation of a flexible ammunition melt-pour manufacturing facility.
(U. S. Army photo by Hayley Smith)

Continued progress on master planning with these explosives safety strategies will allow CAAA to remain flexible for efficient execution of a wide variety of workload to support warfighter readiness as Crane looks to the future of ammunition manufacturing.

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Master planning helps ensure healthy Army communities

by Clarice Waters, Alison Cuccia, Laura Mitvalsky and Ramona Taylor

Our community environment influences all aspects of our lives, including our health. Studies have shown that people who live in walkable and bikeable communities are more likely to be physically active. Similarly, people who live in food deserts are more likely to have poor diets, whereas those who have access to healthy foods are likely to have better diets. Soldiers who participated in a pilot education program focusing on sleep, activity, and nutrition affirmed this concept, noting that the environment was a barrier toward healthy behaviors.

At Area Development Plan (ADP) workshops, installation stakeholders and master planners discuss long-term environmental and structural changes to installation districts. Stakeholders often weave in master planning principles that promote healthy activities through priorities such as developing walkable areas, connecting streets and paths, creating trail systems or linking to existing trail networks, and providing meeting spaces and outdoor area opportunities for social interaction. By promoting healthy activities, installation planners make the healthy choice the easy choice for community members, which ideally results in improved health and quality of life. Highlighted below are a few recent examples of how installations have incorporated healthy community planning strategies in their ADPs.

Fort Leavenworth South Main Post ADP

At Fort Leavenworth, Kansas, the South Main Post district is considered the installation's "Town Center" as it includes mixed-use buildings for industrial, recreational, and community support functions (e.g., Post

(See Healthy Army, on page 25

Pedestrian-scaled elements as depicted in the graphic will enhance the Fort Wainwright, Alaska, South Post District Community Network, features that will encourage walkability and reinforce the District's compact development. (U.S. Army graphic)

(Healthy Army, continued from page 24)

Exchange, Commissary, a bank, gas station, a gym, and school). This district's plan focuses on healthy community planning by proposing to complete a bike and pedestrian network with shaded trails/walkways and safe/well-lit routes by repurposing abandoned rail beds. Routes will join existing sidewalk/trail segments in a complete and continuous network providing access between the housing and community destination areas.

Fort Bragg Smoke Bomb Hill ADP

The Smoke Bomb Hill District of Fort Bragg, North Carolina, is comprised primarily of unit operational facilities and motor pools. This district incorporated healthy community planning into their master plan by (1) promoting and maintaining a walkable, multi-modal transportation network designed to improve connectivity and circulation; (2) providing a campus environment that maximizes functional adjacencies, creating space to improve unit integrity and foster a more pedestrian friendly environment; and (3) maximizing green space to ensure land is available for physical training and social interaction spaces.

The proposed Special Warfare campus will feature facilities that rely on efficient pedestrian interconnectivity to encourage walkability. A wide pedestrian path and a clear, safe crosswalk will enhance connectivity between facilities.

Fort Wainwright South Post ADP, South Post District Community Network

Fort Wainwright, Alaska, is mostly comprised of training, barracks and support areas, unit facilities, and motor pools. During the ADP workshop, participants recognized that the District's close proximity of living, working, and community support areas needed to be enhanced through pedestrian-scaled elements. The plan proposes to (1) consolidate a mix of functions (i.e., retail, fitness, housing, admin, entertainment), (2) widen sidewalks along major physical training routes and high-pedestrian activity centers and improvements around the District's Memorial Park and community support center, and (3) convert a couple of streets to pedestrian-only so that Soldiers residing in the bordering barracks have better access to the park. These features encourage walkability for a mix of user groups and reinforce the District's compact development.

Healthy Army Communities

Recognizing the need to focus on environmental changes that could further promote and sustain healthy behaviors, Installation Management Command is leading a commitment called Healthy Army Communities. The initiative focuses on leveraging existing processes in public health and master planning to change installation environments in order to make the healthy choice the easy choice. This includes the dedication to reshape Army communities to become healthier places to live, learn, eat, work, play, and shop.

In August, the Army Public Health Center partnered with Installation Management Command Master Planners, facilitating the integration of healthy communities' objectives into the existing master planning process to further support readiness and resiliency. Emphasizing public health throughout the entire planning process, including the Vision Plans, Installation Planning Standards, and ADPs, demonstrates the Army's devotion to health.

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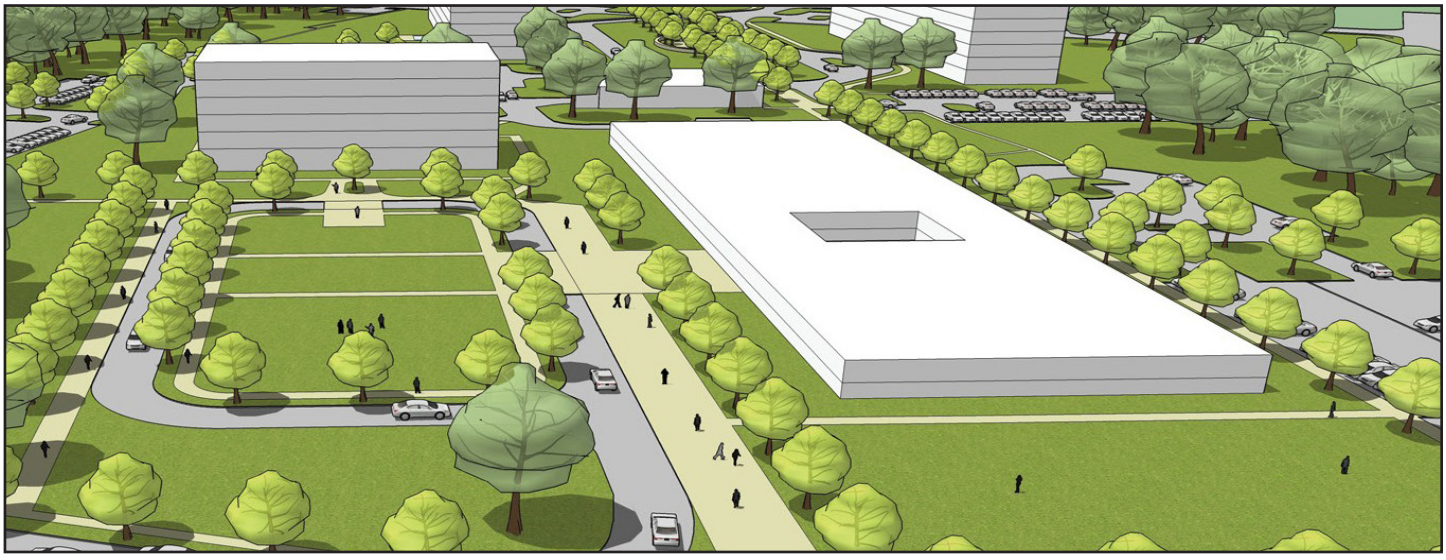

The graphic depicts the proposed Healthy Army Communities integration Area Development Plan for the Smoke Bomb Hill District of Fort Bragg, North Carolina. (U.S. Army graphic)

Healthy Army Communities planning at Fort Benning, Fort Huachuca

by Clarice Waters, Laura Mitvalsky and Maureen Goodrich

With the evolving demographics and missions on military installations, infrastructure has been slow to adapt with these new demands. Evidence suggests that environments that support active living promote resiliency and military readiness. How do we change our installations to improve the overall health of our communities?

The U.S. Army Public Health Center and the Installation Management Command G-4 Master Planners are collaborating to synchronize Healthy Army Communities efforts. In August, Army Public Health Center representatives attended two Area Development Plan, or ADP, charrettes as case studies to inform Healthy Army Communities leadership on best practices for incorporating the Healthy Army Communities initiative into the master planning process.

While healthy community planning is one of the 10 master planning principles discussed during the ADPs, the discussion throughout the charrette is organic with the planning team seeking to understand and meet the requirements of the area stakeholders who range from military mission leaders and garrison support functions to military, civilian and family members. Thus, active living design concepts and healthy community planning principles may not always be prioritized.

The goals of the case studies were (1) determine how well stakeholders received the message and goals of initiative as part of the ADP charrette, (2) assess the feasibility of integrating the completion of a built environment assessment tool, and (3) examine if and how healthy community planning principles were emphasized and integrated into the final ADP.

The Army Public Health Center participated in ADP charrettes for the Main Post District of Fort Benning, Georgia, and for the Buffalo Soldier District at Fort Huachuca, Arizona. Each charrette began with a short briefing about the healthy communities' commitment and how establishing these goals up front can emphasize the impact stakeholders have in creating healthy environments. This, along with introducing the Military Promoting Active Communities, or m-PAC, tool, underlined the center's goal of improving the overall health of the community through the existing master planning process.

The m-PAC is designed to systematically assess built environment components that support active living, specifically features and conditions of street networks, pedestrian and bicycle networks, public transportation options, adjacency to fitness, dining and green spaces, and environmental supports (e.g., landscaping, park/trail benches, water fountains). The tool examines an installations' current infrastructure, to include physical land and scale and facilities features available to the installation's community, and the future plans and policies of installation development that may be found in the Real Property Master Plan.

These discussions should lead to a final ADP with prominently featured healthy planning principles.

Ideally, ADP stakeholders would complete the m-PAC during the charrette, using the master planning processes already in place. Emphasizing Healthy Army Communities and implementing the m-PAC during the ADP charrette help stimulate discussion and motivates new ideas and actionable features tied to a healthy community development. These discussions should lead to a final ADP with prominently featured healthy planning principles.

Due to the ambitious and rigorous schedules for the ADPs, it was difficult to integrate the m-PAC completion exercise in small groups. Instead, the Army Public Health Center staff facilitated m-PAC completion with only the master planner. During the field analysis exercises, participants were given a one-page "healthy community elements" sheet that highlighted the important constructs of the m-PAC. Stakeholders looked for and considered each element during the district field tour, documenting whether the elements existed and if so, to what degree. Due to the size of the Fort Benning Main Post District, charrette participants conducted the field analysis together as a large group by bus. Conversely, during the Fort Huachuca site tour, small groups covered different areas of the district and a "healthy community" representative assessed the healthy infrastructure present in the area.

Participants used the field analysis to create "healthy community" maps of the district, which helped guide the discussion toward identifying, proposing and prioritizing healthy community planning components into the various plan alternatives and ultimately, the preferred plan. While the m-PAC was not integrated into the charrette as planned, installation leaders and stakeholders were still eager to discuss opportunities to create more green space, improve infrastructure to allow alternative forms of transportation (bicycles, walking), create areas for a central community hub, and brainstormed creative solutions to incorporate a farmers market, community gardens, and healthier food options for tenants within the district.

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Avoiding long-term costs through effective master planning

by Lt. Col. Bill Smith, Janie Brady and Mark Gillem

Some people consider planning efforts an expense – just another report to fill the shelves. If that is in fact the case, then the planning process and the plan itself are deeply flawed. Good planning should pay for itself in long-term cost avoidances, enhanced productivity, and mission sustainability. This has been the case at Buckley Air Force Base outside Denver. In a planning effort led by the U.S. Army Corps of Engineers using the planning process outlined in Unified Facilities Criteria (UFC) 2-100-01 (Installation Master Planning), Buckley's planning team uncovered opportunities to avoid unnecessary costs, such as:

Relocated Future Taxiway

The stakeholder-driven plan led to a relocation of a programmed new parallel taxiway that will avoid roughly $1 million in an Environmental Impact Statement and several years. The project also resulted in an additional cost avoidance of up to $30 million due to simplified construction procedures based on the new taxiway location and opens up to 185 acres for new development.

Combat Arms Training Facility

Resiting a programmed Combat Arms Training facility resulted in a cost avoidance of $3 million due to unneeded utility extensions. It also will save personnel significant time in driving to the facility. The project also was moved up on the command priority list due to this new, more affordable siting.

Telluride Gate

Through the planning process, stakeholders determined that a programmed new gate was not required, resulting in a $600,000 cost avoidance.

Medical Parking Lot

Based on the planning effort, stakeholders withdrew a $300,000 parking lot project. They decided they could share parking with existing users and walk a bit more based on what they learned in the planning process.

Environmental Assessment

The process resulted in the documentation necessary to do an installation-wide Programmatic Environmental Assessment at one time versus doing this on a project-by-project basis, which has been the approach in the past. This will result in a cost avoidance of at least $500,000 for seven programmed buildings that will now not need individual Environmental Assessments. As time passes, the cost avoidance will grow substantially.

Regional Synergies

While not quantitative in nature, the inclusion of stakeholders from regional transportation and planning agencies, like the Colorado Department of Transportation, the Regional Transportation District, and the City of Aurora, resulted in operational synergies now being used to synchronize region-wide efforts with the installation's needs. There is now an established trusting and cooperative atmosphere between the military and these agencies, which may save time and money later.

Readiness and Environmental Protection Initiative (REPI)

The installation is currently pursuing a 1,000 plus acre buffering project to protect multiple mission sets. Prior to developing the UFC 2-100-1 compliant Master Plan, Buckley had a $27 million land acquisition Military Construction project in its sights. The fidelity of the installation's Master Plan data assured the commander that endorsing the REPI project was in the best interest of mission sustainment at Buckley, even though the installation footprint end state will be reduced by about 100 acres. Instead of a $27 million cost, nine community partners have contributed more than half of the REPI project dollars, avoiding at least $13 million in initial costs while creating open space and trail connectivity throughout the community. The long-term maintenance costs of fencing, as well as developing and maintaining roads reaches far beyond the initial $13 million in cost avoidance. The property can now be better used for recreation and multi-modal connectivity for the community, while sustaining and enhancing mission readiness. The installation could not have pursued the REPI project without the stakeholder development and data fidelity created through the master planning process and products.

Stakeholders from across the Denver metropolitan region participated in Buckley Air Force Base's planning process and took ownership over the final plan. (Image courtesy The Urban Collaborative, LLC.)

Building In-House Capacity

By engaging stakeholders in the planning process, they could participate in planning efficient solutions. The process used at Buckley included actual planning and training in the UFC planning process and is transferable to other installations. The training itself creates a momentum for better planning. In one example, the process used at Buckley empowered in-house, government planners from the region to create their own plans at Cheyenne Mountain, Colorado. A government-run, in-house planning effort at Cheyenne Mountain produced a new UFC-compliant Vision Plan and two Area Development Plans, which avoided up to $300,000 in contracted costs.

In the end, good planning pays dividends in the short and long term. But plans cannot be mere lists of known projects. They need to think beyond today toward what could be and then make a business case for more effective solutions.

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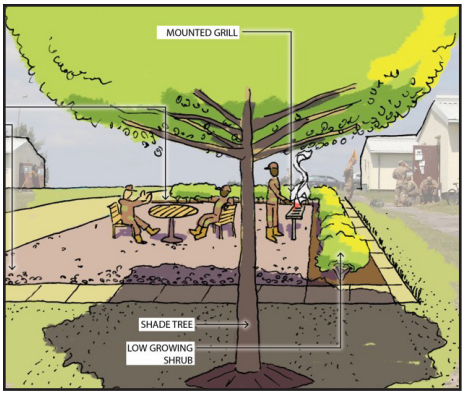
ADP's address Soldiers' physical, mental readiness fitness

by Ramona Taylor

This year's Headquarters Installation Management Command's Area Development Plan, or ADP, showcase addresses Soldiers' physical and mental readiness and well-being through real property solutions. A ready and resilient Soldier is a Soldier who has access to infrastructure and amenities that not only promote physical but also mental fitness. The following ADPs are a sampling of the outstanding work that dedicated and knowledgeable installation master planners and stakeholders have accomplished recently to develop solutions addressing Soldier physical and mental readiness and fitness.

Fort Bragg Smoke Bomb Hill District

Maximizing training areas is the cornerstone of readiness, and the land on which training is performed is a crucial asset at Smoke Bomb Hill at Fort Bragg, North Carolina. Accommodating large unit training and joint exercises requires reserving adequate square footage for training areas; therefore, Fort Bragg has focused on training area preservation and providing room for future training expansion. Opportunities for close-in training using quad green space for formations and general physical training have been explored as part of the Smoke Bomb Hill District ADP. In addition, physical training trails such as the 20th Engineer Brigade Trail are to be improved throughout the District and connect to existing trails to work as a complete network. While there are existing physical training areas in addition to the existing trail network, such as the Frederick Performance Enhancement Center and the Iron Mike Fitness Center, there still is a shortfall in space for Soldiers to engage in physical training. Due to a lack of space, major thoroughfares have become physical training routes, creating a dangerous situation for Soldiers crossing roads and exacerbating traffic issues. Opportunities to create new indoor and outdoor physical training spaces are considered a priority.



This "after graphic" illustrates what is envisioned for the U.S. Army Garrison Bavaria, Germany, Tower South Gathering Space. (U.S. Army graphic)

Fort Jackson Victory District

Fort Jackson, South Carolina, represents the point of transition from civilian to Army life for a large portion of the Army's trainees. One of the goals of the Victory District is to provide a safe and secure physical training, trainee movement, and pedestrian network. Significant volumes of foot traffic is a unique characteristic of the Victory District and one that requires careful planning to accommodate. The Trainee Movement Plan developed for the District supports Soldier readiness by optimizing training routes and by accommodating Trainee movement and physical training through a logical, connected, and safe pedestrian network. The network provides safe and efficient pedestrian movement for Trainees, minimizes conflicts between vehicles and pedestrians, and preserves efficient access to training areas. The elements of the network are also aligned with surrounding architecture and landscaping, and support the activity nodes they connect. As troops navigate through the District, safety is of primary concern, with well-lit and highly visible crosswalks wherever the route intersects a street.

USAG Bavaria Tower Barracks South

One of Tower Barracks South District goals is to meet the needs of Soldiers in Germany by providing basic services and amenities to enhance workflow, socialization, fitness, and mental well-being. Optimizing the training environment through improvements to common areas would support the needs of Soldiers. While the mission takes precedence, the district's image has developed a utilitarian appearance. Currently, outdoor areas between billeting offer little to no refuge from sunlight and there are no seating areas for relaxation. Supplemental latrines are poorly located and aesthetically unpleasant. Small seating areas with semi-private landscaping could encourage social interaction and facilitate socialization after work hours or during breaks. These low-cost improvements could provide broad benefits for Soldiers and have positive impact to morale.

Improving training areas as well as creating new outdoor physical training locations will help enhance physical readiness of Soldiers who train at the Smoke Bomb Hill District, Fort Bragg, North Carolina. (U.S. Army photo)

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ADP workshop helps Natick Soldier Systems Center set goals

by Ramona Taylor, Maureen Goodrich and Jason Gove

If Soldiers wear it, eat it, sleep under it, or have it airdropped to them in theater, it can be traced back to the U.S. Army Natick Soldier Systems Center. The center's history spans back to 1954 where supporting Soldiers has continued uninterrupted for more than six decades. As the national and international leader in warfighter science and technology development, Natick supports the Soldier – maximizing survivability, sustainability, mobility, combat effectiveness and field quality of life.

To accomplish this mix of research and development, U.S. Army Garrison Natick must provide its scientists, engineers and Soldiers unparalleled facilities that can withstand the daily rigors of use.

The Natick Soldier Systems Center is the Army's one-stop Soldier-support organization. It researches, designs, and tests materials and technologies for all branches of the U.S. military and focuses on making the world a better place for all members of the Armed Services. Located in Middlesex County, Massachusetts, with a total population of approximately 2,000 people, Natick is a relatively small installation organized into a single master planning district to more effectively conduct long-range planning.

During an August Area Development Plan workshop, stakeholders identified four master planning goals with multiple objectives, a few of which are highlighted below:

Promote a Safe, Secure Installation

Partially bound by water with approximately 30 percent of its northern perimeter adjacent to a primarily residential neighborhood, there is no room for expansion at Natick. One of the objectives within this goal is to prevent encroachment issues such as unauthorized entry to the installation, noise, incompatible land uses, and other actions that may impact the center's mission. Another objective focuses on improvements to the Access Control Point and vehicle inspection area, which improves installation security and traffic flow overall. A final objective addresses driver and pedestrian safety, road and parking area restriping and reconfiguration, and improvements to pedestrian circulation.

Maintain a Sustainable Installation

Sustainable planning can range from infill and compact development to energy conservation. The center's parking is dispersed in various areas adjacent to buildings, an inefficient use of valuable land and causes vehicle travel throughout the installation. Given the size of the installation, it is more efficient and convenient for the workforce to park in one central area and walk. Consolidating parking also would free up space for future infill development. Natick also is focused on addressing energy management. The proposed cogeneration plant in the master plan supports sustainability by generating heat and power for the installation, while upgrading outdoor lighting to current standards improves energy efficiency.

Create Adaptable Infrastructure

Spaces designed for a single, fixed purpose limit their usability. Overly customized buildings planned for specific uses and equipment limit future adaptability. Mission changes, technology upgrades, and fluctuation in the number of personnel impact how a space can be used or configured. The center seeks to reuse its existing infrastructure to make it more flexible and reconfigure interior spaces to become more functional to accommodate a variety of users and uses.

Attract, Retain the Best Workforce, Partnerships

Natick Soldier Systems Center seeks to attract and retain a highly skilled civilian workforce. This is challenging in a metropolitan market that offers numerous employment opportunities for job-seekers. Recruiting top talent when the competition offers modern, state-of-the-art facilities and attractive benefits is challenging. Natick addresses this challenge by capitalizing upon its close proximity to the Boston metropolitan area, which offers a high quality of life, as well as its partnerships and collaboration with more than 30 world-class academic institutions in the region.

Natick also fosters outreach and prepares potential future employees by working with the State of Massachusetts, a number of educational networks and foundations focused on Science Technology Engineering and Math initiatives, and with federal partners. NSSC is hard at work to improve community services and amenities, including recreational facilities and fitness trail, additional food options, and modernizing its 1950s infrastructure.

Natick is a small installation with a big mission – supporting warfighters with the most innovative and advanced materials and technologies in the world. Through its emphasis on adaptable, sustainable and safe facilities and infrastructure and the importance it places on attracting top talent, Natick positions itself through its real property master planning goals and objectives to continue to provide steadfast support.

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Non-permanent housing options can meet long-term needs

by Dale Hartmann

Imagine you're a commander and you've just been given a set amount of Military Construction money allocated to build a barracks. Do you want a "temporary" facility or a "permanent," one? All things being equal, I imagine most commanders would ask for a "permanent" facility. However, from where I sit in the U.S. Army Corps of Engineers Center of Standardization for Nonpermanent Facilities, or CSNF, "temporary" and "permanent" actually have very specific meanings, and all things are often not equal.

When it comes to "temporary" housing, particularly in the military, tents and trailers are usually the first things that come to mind. They do not have to be. The CSNF has a wide range of options for both housing and other facilities but one of our biggest challenges has been convincing people that something "temporary" can meet their long term needs.

When we are dealing with customers, "temporary" and "permanent" are not just descriptors, they are specific codified guidelines and criteria that delineate each. These criteria have to do with what is or is not required in a building and with the building's expected lifespan.

Underneath the blanket term of "non-permanent" facilities are sub-categories of construction levels. There's "initial," which is up to six months and is often some type of fabric construct. "Temporary" would be anything from six months up to two years and there's "semi-permanent," which can have a building lifespan of up to 25 years with proper maintenance.

For example, Corps of Engineers Mobile District is currently using one of our designs for the Navy that is meant to last 25 years. We have barracks designs being used by the Coast Guard at Port Everglades that have approximately a two-year lifespan. It all depends on specific needs.

These delineations can be particularly useful in overseas contingency operations where permanent facilities are not allowed to be built in locations that are not "enduring." But, even when you have the option of choosing between "permanent" and "temporary" barracks, the "non-permanent" option may provide you more bang for the buck.

3D printed models of various housing designs are produced by the U.S. Army Corps of Engineers Center of Standardization for Non-Permanent Facilities. The Center has designs available for everything from individual housing units to large scale barracks complete with overhead coverage that can protect against direct and indirect fire. (Photo by Shannon Hodges)

As a hypothetical example, we could build a "non-permanent" facility with protection from direct and indirect fire for much less than the cost of a "permanent" one. We also are able to house more personnel in a "non-permanent" facility as they do not have the same space requirements as a facility designated "permanent" and/or you might be able to provide more amenities for less money. Additionally maintenance costs will generally be much lower.

That is not to say there will not be tradeoffs. For example, one of the reasons you generally have lower maintenance costs is that "non-permanent" facilities are not required to have an overhead sprinkler system, but generally a "non-permanent" facility will meet your needs as well as a "permanent" one.

There also is a misconception that if the funding for a barracks comes from Military Construction money then you must build a "permanent" facility. This isn't actually the case. We could build a "semi-permanent" facility that would have a 25-year lifespan and meet all of a unit's requirements for less than the cost of a "permanent" one.

Another misconception is that "non-permanent" means trailers or metal but we can do concrete frames, drop ceilings and many other amenities in a non-permanent structure that would look very much like what a barracks should.

One of the best things about the Center of Standardization for Nonpermanent Facilities is that we make it our business to know all of the criteria mentioned above, and we have off-the-shelf designs ready to go. This can lower customer cost as well as construction time. And this is not just for barracks. We have more than 40 off-the-shelf designs that cover everything from chapels to medical and recreation centers to command posts. We also have pre-designed interiors and site layouts based on set requirements (such as a 100-man camp).

An important final note is that although the CNSF falls under USACE's Middle East District, we can provide designs to any government entity and we can tailor the designs to almost any use from basic shelter on a training range to long term housing after a natural disaster and we have the capability to model all of these on a state of the art 3d printer.

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West Point Cadet barracks receive updated furniture, too

by Mark Thompson

Someday when all the cadets at the U.S. Military Academy at West Point, New York, sit down at their desk to do homework or finally climb into bed after a long day of classes and training to become the Army's next generation of leaders, they will do so on furniture that got there thanks in large part to the efforts of the Furniture Program at the U.S. Army Engineering and Support Center, Huntsville.

Huntsville Center is working with West Point Garrison, the Corps of Cadets and the U.S. Army Corps of Engineers' New York District to provide updated barracks and administrative furnishings in support of a variety of new construction projects and the ongoing Cadet Barracks Update Program at West Point.

In 2016, Huntsville Center's Furniture Program coordinated the completion of the first of seven scheduled renovations on the historic West Point campus at the MacArthur Long Barracks in September. Outfitting furniture for 258 rooms for 516 cadets in the 191,000-square-foot facility while construction inside the building continued required careful communication and commitment to the U.S. Army Corps of Engineers' "one door to the Corps" philosophy.

The Cadets Barracks Uprgrade Program at West Point, which began in 2012, is estimated at $658 million. The renovations include all nine historic barracks; Scott, MacArthur Short, MacArthur Long, Pershing, Eisenhower, Grant, Bradley, Lee and Sherman Barracks.

The renovations are to meet current Army standards and to correct deficiencies such as overcrowding, and deteriorated building systems.

Close coordination is both key and ongoing to accommodate needs, meet timelines and help keep students on schedule.

"New York District is executing USMA's CBUP and is heavily involved with the Furniture Program in making sure the requirements are thoroughly defined, dual occupancy constraints are understood by all and that the schedule allocates sufficient time for furniture install. All of these aspects help ensure that we meet schedule, successfully install and provide the right solution for the cadets' use," said Unaccompanied Housing Program Manager Stephanie Hardin.

Davis Barracks is a $190 million, Leadership in Energy and Environmental Design Silver certified building that houses 650 cadets in the center of campus.

The Furniture Program procured and managed the installation of $1.6 million of metal casegoods for the cadets' sleeping rooms, administrative office and training furniture.

Current construction and renovation continues even while furniture is being installed, and cadets need a place to study and live, Hardin said. For the majority of the contracts, construction/renovation and furniture installs will take place simultaneously.

"Dual occupancy is when furniture installation is executed while various construction trades and/or activities are ongoing," she said, "Dual occupancy makes the install twice as difficult, but is often required to meet the timeline for occupancy, so the cadets can stay on their academic schedule."

Even though the barracks will go through a complete gutting and will be taken down to the studs, Hardin and her team won't wait for the dust to completely settle before starting the process for procurement. This process takes roughly nine months from requirement identification to install and is executed simultaneously with the renovation progression.

Along with barracks furnishings, Huntsville Center's Sara Cook serves as the project manager tasked with meeting the administrative furniture needs. While the unaccompanied barracks program has standardized specifications for most of the furniture acquired and placed in the barracks buildings, administrative furnishings present opportunity and challenge to meet the particular requirements of the customer.

"For the ADMIN furniture needed, our technical interior design experts have the opportunity to develop furniture requirements based on our customer's specific functional and aesthetic needs. How do the students function in that space? Once the functional and aesthetical needs have been developed, our ADMIN design team takes the furniture requirements and develops the technical specifications," Cook said.

Huntsville Center's Furnishings Program is a full service organization capable of providing project management, interior design, procurement, installation and quality assurance for all federal agencies' furniture needs. The program procures barracks and administrative furnishings for federal agencies worldwide.

Newly installed furniture is ready for use inside Davis Barracks at West Point earlier this year. Huntsville Center's Furniture Program is coordinating the purchase and installation of barracks and office furnishings during the U.S. Military Academy's multi-year Cadet Barracks Update Program. (Courtesy photo)

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A fixer upper no more: Soldiers have an updated place to call home

by Julia LeDoux

There's no place like home.

Soldiers from 289th Military Police Company, 4th Battalion, 3d Infantry Regiment (The Old Guard) and members of the Joint Base Myer community, near Arlington, Virginia, conducted a ribbon-cutting ceremony Oct. 31 to mark the completion of a $27 million renovation project at Bldg. 247.

"I actually love it," said Sgt. Tahjanae R. Watkins. "Our old barracks are kind of small. These are really big. I'm really excited."

The deteriorating building was repaired and renovated and provided modern energy-efficient systems, updated finishes, new furnishings and appliances.

The building's 56 rooms and 37 office spaces have been outfitted with new furniture and appliances. Most of the rooms are arranged in one-plus-one modules in which two adjoining single-occupancy rooms share a common bathroom and a kitchenette equipped with an electric stove top and microwave oven.

Joint Base Myer-Henderson Hall Commander Col. Patrick Duggan said he is ecstatic about the opening of the barracks.

"But probably not as ecstatic as the folks who have to live and work in it to finally see it come to fruition," he said.

Duggan said had it not been for the installation's command sergeant majors, who kept the project front and center on the radar screens of senior Army leaders, the project would not have gotten done.

"This is a strength to the NCO profession of our U.S. Army and for that I am thankful," he said.

Joint Base Myer-Henderson Hall Command Sgt. Maj. Stephen Harris noted that the project took 382 days to complete, with construction beginning on the $27 million project in September 2016.

"As I gaze behind the building behind us, I cannot help but to think of my time in the barracks of 20 years ago," Harris said. "I have to admit that my barracks were nowhere near as glamorous as this building behind us, 247."

The two-story U-shaped building was constructed in the late 1800s, and Harris said it has housed Soldiers who fought in conflicts stretching back to World War I. Numerous presidents have participated in events on the field across the street from the building, and the Wright Flier took over not too far from its location, he said.

"It boggles my mind to think about the stories this building could tell, not to mention the stories of the Soldiers who have walked through these doors for nearly 130 years," Harris said.

Harris said he shared his original barracks room at Fort Benning, Georgia, with four other Soldiers who were separated by wall lockers. He got his own room when he returned to the post after a tour in Korea.

"I took ownership of my room and the building that housed me and my battle buddies and assured our home was well taken care of," he said.

Looking at the Soldiers who will live in the renovated barracks, Harris told them the building is their home.

"I am pleased and happy to be a guest at your home," he said.

Peter Grimberg, president of the John C. Grimberg Company, spoke directly to the Soldiers who will reside in the building during the ceremony.

"The design and construction and renovation of a 123-year-old structure was to vastly improve the living conditions for you guys, at the same time protecting you while extending the lifespan of this historic building," he said.

The brick and timber frame structure has a basement and a rear-facing courtyard and is located in Fort Myer's historic district so any work on it must comply with state historic preservation guidelines.

"Then, there are the issues of working on and upgrading very old infrastructure," Harris said.

Secure blast resistant construction methods were used throughout the upgrade in accordance with anti-terrorism and force protection requirements, including blast-rated windows, reinforced walls and flooring.

"I'm impressed by the amount of time and money the Army has put into improving the lives of Soldiers," said Pfc. Taylor Highsmith, who will live in the barracks. "We definitely try to put all we can into this Army, give it all we can day in and day out. Things like this really shows that the leadership really appreciates how we help."

Highsmith said the building features a lot of touches that make it feel personal and welcoming.

"It definitely feels like a home," he said.

The work at Bldg. 247 is the first phase in a 10-year repair campaign that will see all the barracks along Sheridan Avenue renovated.

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Retro-commissioning training provides insight, technical skills

by Eileen T. Westervelt and Brian C. Clark

The buzz is growing about retro-commissioning as increasing numbers of installation energy managers and their kindred spirits (facility engineers, operations and maintenance technicians) gain hands-on experience with operating Army facilities more efficiently within tight budgets.

During the last few years, dozens of facilities personnel have participated in Army retro-commissioning training practicums and are coming away with pertinent insights and technical skills to apply at their home bases. They are finding that, for typical facilities systems, they can get what they need for less by using their existing equipment to full advantage. By systematically reviewing, analyzing and testing energy equipment (primarily heating, ventilating and air conditioning, and lighting), they can spot equipment operational faults and untapped opportunities for enhanced control that result in energy waste, comfort issues, or maintenance headaches. Through low cost repair, adjustment, and tighter control of this equipment they can typically cut 16 percent of their energy use with a payback of their investment in a little more than a year.

Retro-commissioning is essential to meeting Army sustainability goals and is appropriately mandated for many federal facilities. Since 2014, U.S. Army Garrison Presidio of Monterey, California, has been hosting training events to develop the needed in-house skillset to conduct, contract for, or oversee this critical effort. The 2017 Army Practicum was organized by the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory, sponsored by the Assistant Secretary of the Army for Installations, Energy, and Environment, and included a robust online learning curriculum to help attendees prepare for the rigorous on-site training component. Another Retro-Commissioning Practicum has been tentatively set for June 18-22 at Fort Leavenworth, Kansas.

Modeled after successful private sector retro-commissioning instruction, the Army's training program uses a blended learning format with both remote and on-site training components to develop practical field skills and design insights through the adoption of 10 important skillsets.

The program starts with a skills assessment that helps participants identify if any technical areas need review. For six to eight weeks prior to the on-site class, participants develop or brush up on heating, ventilating and air conditioning fundamentals, utility data analysis, and retro-commissioning concepts at their own pace through a series of video lessons, 3D simulation explorations, practice exercises and optional virtual office hour discussions. This pre-site work allows students a chance to get familiar with the concepts needed for the field portion of the class.

Groups taking advantage of Army Retro-Commissioning training

81st Regional Support Command, Fort Jackson, South Carolina
Aberdeen Proving Ground, Maryland
California State University, California
Fort Carson, Colorado
Fort Devins, Massachusetts
Fort Drum, New York
Fort Greely, Alaska
Fort Hamilton, New York
Fort Hood, Texas
Fort Huachuca, Arizona
Fort Irwin, California
Fort Leavenworth, Kansas
Fort Polk, Louisiana
Fort Riley, Kansas
Installation Management Command Europe, Germany
Lake City Army Ammunition Plant, Missouri
Naval Facilities Engineering Command, Washington, D.C.
Naval Post Graduate School, California
Oklahoma Military Department, Oklahoma
USACE ERDC Construction Engineering Research Laboratory, Illinois
USACE Headquarters, California
USACE Monterey, California
USACE Sacramento Engineering Division, California
USAG Presidio of Monterey, California
USAG Redstone Arsenal, Alabama
Washington National Guard, Washington
White Sands Missile Defense, New Mexico

The weeklong on-site laboratory is a hands-on immersive retro-commissioning adventure where student teams explore building performance with their technical guides and develop energy optimization measures through a series of steps including facility scoping, systems diagramming and systems thinking, portable logger or building automation system trending, functional testing and heating, ventilating and air conditioning operations data analysis. An over-the-shoulder training approach allows participants to touch and use assorted building performance tools and safely observe real world operational issues. Leading industry experts deliver supporting instruction, and are available to assist teams in system diagnosis and development of correctional and optimization measures. The practicum ends with command-level presentations that use energy and financial calculations to package implementation measures.

Survey feedback from attendees has been overwhelmingly positive with the practicum often touted as the type of technical training sorely needed by facilities management teams. The enthusiasm of the class and its instructors is palpable and infectious. The cross pollination of ideas from multi-organization teams is refreshing. There is high transferability of these skills to other areas of facilities management including project scoping, design review, construction quality assurance, commissioning, heating, ventilating and air conditioning controls, and ongoing operations.

Seats are limited for the 2018 Army Retro-Commissioning Practicum. Use the contact information below to request a space. Attendees will be exposed to hydronic and air-side equipment operation, building automation systems, portable data loggers and other building performance instruments, system diagrams, applied psychrometrics, several analytical tools to support facilities engineering and systems optimization, as well as an introduction to potential contracting language.

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Lab conducts study of cold's impact on insulated pavements

by Marie Darling

Fort McCoy, Wisconsin, is the site of an insulated pavements test that, if successful, will provide a cost effective, manageable solution for maintaining 270 miles of heavily trafficked, cold weather impacted streets, parking lots and staging areas. The work is being conducted by a team from the U.S. Army Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory, or CRREL, working in conjunction with the Fort McCoy Directorate of Public Works.

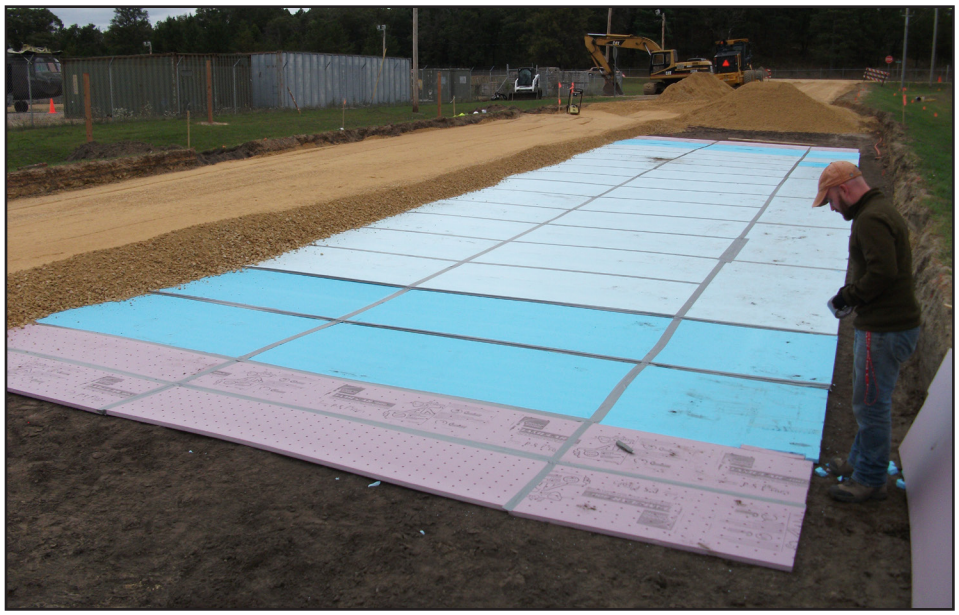
Leading the work is the lab's Engineering Resources Branch team. Part of its work was to install a prototype pavement section through the Army's Installation Technology Transition Program. The approach uses an insulated pavement consisting of innovations in materials and cost-effective construction practices to withstand damage over time from repeated frost action.

Located on 60,000 acres, Fort McCoy is primarily used as a "Total Force" military training center hosting all branches of the service. In fiscal year 2017, more than 156,000 personnel were trained there, along with support for retirees and family members. The installation supports an abundant mobile population and heavy military and commercial vehicle traffic in a geographic area with average winter temperatures dipping well below freezing.

The installation has experienced a number of asphalt roadways and other paved areas with shortened lifespans requiring costly annual repairs because of seasonal frost heaving and thaw settlement failure modes leading to distress of asphalt pavements, such as fatigue cracking, upheaval and potholes.

"We installed both moisture sensors and temperature probes within the test section that will allow us to see how the temperature gradient changes with the foam board insulation in place under the pavement," said Alex Stott, a CRREL research mechanical engineer. "Between the four-inch pavement layer and two-inch thick insulation, we placed a subgrade consisting of 24 inches of small, loose stone aggregate. The subgrade soil's thickness and placement will help keep the paved area dry and less apt to freeze."

Capitalizing on previous CRREL pavement prototypes and modified construction procedures, the team designed and installed a prototype pavement section that uses low cost construction materials to provide insulation below the base course. This approach prevents sub-freezing temperatures from reaching the subgrade causing winter heaving from McCoy's frost-susceptible, moisture-prone soils.



At Fort McCoy, Wisconsin, U.S. Army Cold Regions Research and Engineering Laboratory Mechanical Engineer Alex Stott prepares the foam board insulation layer of the experimental roadway. Moisture sensors and temperature probes installed within the test section will allow researchers to see how the temperature gradient changes with the insulation placed under the paved surface. (Photo by Marissa Torres)

"The foam board insulation is a very light material and we do not need a lot of it, what we do need can easily be trucked in," Stott said.

"We have a lot of heavy military and commercial traffic in support of Fort McCoy's unique training mission," said Mark Nelson, an engineering technician with Fort McCoy's Construction Inspection Branch. "The test section is in an ideal location, with a sloped road, high water table, static and dynamic loads and it is in the 'teeth' of the northwest wind. We are very interested in seeing the test data."

According to a cost analysis study conducted by project lead Marina Reilly-Collette, if this prototype test section is successful and the practice is extended to its inventory of other ailing pavements, Fort McCoy could potentially save up to 40 percent in construction costs through extensions in the lifespan of highway surfaces eliminating the replacement of the subgrade of base roadways. CRREL's insulated pavements methodology costs less than 13 percent per additional mile than uninsulated pavement, making the up-front cost manageable and guarantees substantial long-term savings.

"The current prototype tests a new method of implementing the transitional section between the existing roadway and the insulated pavements repair section, avoiding differential freezing and potentially reducing installation costs, while improving safety," Reilly-Collette said.

CRREL will continue to monitor the efficacy of this pavement solution over the next two years using a combination of instrumentation for real-time monitoring and periodic non-destructive testing.

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Darling is a public affairs specialist with the U.S. Army Engineer Research and Development Center.

Group offers installations technology opportunities

by Natalie Myers, Kathryn Guy, Sean Wallace, Edward Nykaza, and Michael Parker

The Office of the Chief of Staff for Installation Management's Installation Technology Transition Program demonstrates, validates and implements new technologies to reduce the operations and maintenance requirements on facilities. The program showcases and fast tracks the infusion of new technologies and innovative practices into routine Army installation management operations.

In addition to the Installation Technology Transition Program, the Technology Standards Group executes technology evaluations, conducts measurement and verification on technologies installed in the garrison environment, and investigates up and coming technology opportunities. The following are examples of Technology Standards Group efforts.

Technology Evaluation

Thermochromic paint additives allow paints to change color with temperature. This current Technology Standards Group technology evaluation is determining if thermochromic additives to latex paint improves energy efficiency. Initial evaluations focused on the additive to paint ratio to probe color scale effect on thermal gains and ultraviolet stability testing to determine durability of additives exposed to weather and frequent color changes. The complete study was scheduled for completion first quarter of fiscal 2018 and available on the Installation Technology Transition Program website: https://eko.usace.army.mil/virtualteams/ittp.

Measurement and Verification

Powerhouse Defender equipment installed at the Newman Fitness Center at Fort Stewart, Georgia, is used to balance power at the facility. With support from the Technology Standards Group, a current study is determining if the equipment successfully increases the power factor and voltage supplied to the facility. An on-site data logger collected the data with the Powerhouse Defender operating in varying intervals during an eight-day period. Results to date are promising. The full report also is available on the Installation Technology Transition Program website: https://eko.usace.army.mil/virtualteams/ittp.

Up and Coming Technologies

Blast noise from large caliber munitions and demolition charges at military installations, for example, can compromise the Army's ability to conduct testing and training activities. A series of acoustic monitors become necessary in keeping acceptable noise levels. A current commercial monitoring station runs around $40,000 per unit, a hefty price tag to the Army. To minimize the cost of monitoring equipment, the U.S. Army Engineer Research and Development Center developed the Low Cost Acoustic Monitor, at a fraction of the cost of commercial products. The Technology Standards Group is supporting prototype development with prototypes expected to be ready for testing in fiscal 2018.

The Stirling Cycle Engine is a heat difference engine that operates off waste heat. (Photo by Michael Parker)

Another example is the group's sponsored scoping study on the Stirling Cycle Engine to determine the viability of using this technology to support operations in austere environments. It is a heat difference engine that operates off the waste heat (exhaust gas) generated by common equipment such as backup generators and solid waste incinerators. These engines are capable of generating high levels of useful power from very low temperature deltas. This technology is being investigated for its alignment with the Army Net-Zero Initiative (www.Army.mil/ASAIEE) to be less dependent on fossil fuels.

These examples are just a subset of the work coordinated through the Technical Standards Group. To participate in either testing a technology through the Installation Technology Transition Program or having a technology evaluated through the technology evaluation program, visit the program's website at https://eko.usace.army.mil/virtualteams/ittp or email Vincent Kam at Vincent.w.kam.civ@mail.mil.

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Kam is the Chief, Facilities Engineering Branch, Office of the Assistant Chief of Staff for Installation Management, and the authors all work for the U.S. Army Engineer Research and Development Center.

'World-class education': Post breaks ground for new school

Story and photo by Nathan Pfau

FORT RUCKER, Alabama – A project years in the making took another step closer to fruition as Fort Rucker officials broke ground Oct. 3 on a facility meant to invest in the minds of future generations.

Officials from the Department of Defense Education Activity, the U.S. Army Corp of Engineers, and U.S. Army Aviation Center of Excellence and Fort Rucker came together during the groundbreaking ceremony for the Edmund W. Rucker Elementary School, set to open in 2019.

"This new, 21st-century facility is a demonstration of the commitment of the Department of Defense Education Activity to achieve academic excellence while serving the unique needs of our military-connected children," said Dr. Lisa Coleman, Department of Defense Education Activity (DODEA) Georgia/Alabama community superintendent. "DODEA's core values state that we believe that students are at the heart of what we do. Our learning environments are student centered, stimulating and relevant.

"As we prepare our students to utilize the 21st-century skills of critical thinking, collaboration, communication and creative problem solving, it is only fitting that our physical plant parent our needs," she said. "This is not just the breaking of ground on a new school, but the objective of this project is to modernize our facilities, and continuously aim to transform the education environment through innovative and state-of-the-art technology."

The new school, which will be a 175,000 sq. ft., state-of-the-art facility, is being built on the site of the old school that was built in 1963. The new school will house grades pre-k through sixth grade, bringing both the primary and elementary schools together under one roof. Having the students under one roof is something the schools have been working toward for some time and will better serve the mission of Fort Rucker schools, said Dr. Vicki Gilmer, principal of Fort Rucker Schools.

"One of the things I'm most excited about is that all of our families will be able to have their children in one location," she said. "To have the opportunity to be able to serve both of our families – our younger children and older children – in one location is going to be fantastic.

"This makes us one team and one community," the principal said. "Fort Rucker is truly above the best and our schools have been above the best, but our schools have been separate. We've had different goals and different strategies … and this give us the opportunity to combine our efforts and our talents into one mission for our kids."

The modernization of the school gives the opportunity to provide a new, fresh teaching environment for the children, which will enhance the way the students are able to learn, Gilmer added.

"The new school has been designed for critical thinking and collaboration – all the skills that students are going to need in the future," she said. "It's really designed with an atmosphere that has children together learning instead of classrooms where they are stuck with one facilitator."

The new facility will feature "neighborhoods" instead of traditional classrooms where classes will be arranged in a more open room design, which will allow collaboration between classes and allow for an innovative, interactive way of learning.

William G. Kidd, USAACE and Fort Rucker deputy to the commanding general, said the new school is a great step forward in being able to provide world-class education for the children of Fort Rucker.

He added that while the facility will provide an environment that fosters learning in the modern era, the real task lies with the educators within those walls.

"There are many things that have changed in our world since 1963, but one thing is for sure – our commitment to education to the betterment of our children," he said. "This is going to be a wonderful environment for our children, our educators and our volunteers to participate in the education process."

"And despite the great craftsmanship that the construction crews are going to do, and the tremendous architecture and thought that went into this building, it's just brick and mortar," Kidd said. "The magic occurs with the educators and volunteers who come here and interact with those children, but this facility will be worthy of that task and enable them to do things that they can't do now."

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Officials from the Department of Defense Education Activity, the U.S. Army Corp of Engineers, and the U.S. Army Aviation Center of Excellence and Fort Rucker, Alabama, break ground on the new Edmund W. Rucker Elementary School during an Oct. 3 groundbreaking ceremony.

Army Reserve conducts resilience, sustainability training

by Jonelle Kimbrough

Among Saguaro cacti that stretched to painted deserts and palm trees that reached for watercolor sunsets, sustainability professionals from the United States Army Reserve gathered in November in Tempe, Arizona, for the enterprise's Mission Resilience and Sustainability Training.

For three days, professionals from across the Army Reserve gathered to collaborate, share ideas and learn new ways to develop and implement energy, water, solid waste and environmental quality projects at Installations, Readiness Divisions and the Mission Support Command.

Paul Wirt, chief of Army Reserve Sustainability Programs, said that the idea for the training developed from a need and a desire to tie sustainability even closer to readiness. At their core, the Army Reserve's sustainability efforts protect the natural resources that are vital to every mission. They enhance the efficiency of facilities, and they improve the well-being of the Army Reserve's communities. Army Reserve Mission Resilience and Sustainability Training was designed to bolster those concepts and pave the road for new, innovative approaches to conservation.

"Now, more than ever, it is critical that the Army Reserve has the mission resilience to continue operations at our facilities around the world, despite any manmade or natural crisis," Wirt said. "Energy and water security concerns, environmental considerations, community engagements and partnerships are all critical readiness aspects. Sustainability is all about looking at our opportunities for the future in an integrated and holistic approach. This training is a significant milestone for the Army Reserve in bringing our subject matter experts together to chart a path forward."

The Army Reserve selected Arizona State University as the primary host for the first Mission Resilience and Sustainability Training because the school is a well-established leader in sustainability education. The university created the nation's first School of Sustainability in 2006 as a part of its Julie Ann Wrigley Global Institute of Sustainability.

Colonel Marshall Banks, Director of the Army Reserve Installation Management Directorate, opened the training at a plenary session that featured Boone; Wirt; John "Jack" Surash, Acting Deputy Assistant Secretary of the Army for Energy and Sustainability; and Addison "Tad" Davis, Principal Deputy Assistant Secretary of Defense for Energy, Installations and the Environment.

Surash praised the Army Reserve for its significant contributions to the Army's energy conservation and cost avoidance successes, and he called for more "smart ideas" to come from the participants. "Energy resilience is important for the Army," he said.

Davis called the Army Reserve a "true sustainability force" that is enhancing Army readiness, building valuable partnerships and using taxpayer dollars responsibly through resource conservation. Quoting American journalist Thomas Friedman, he encouraged the professionals in attendance to "do a deep dive," "transform the DNA" of their programs and "reimagine their processes for a more sustainable outcome."

Wirt discussed a "tipping point," when Army Reserve Sustainability Programs would move from compliance to innovation. Until now, Army Reserve Sustainability Programs have focused primarily on meeting mandates and creating a foundation of clear strategies and baseline data, from which progress in energy conservation, water conservation and waste diversion can be tracked. Now, the programs can be creative.

"Our collective path forward is clear," Wirt said. "Now is the time to move forward, make a holistic impact, connect with our communities and lead the Department of Defense in the years to come."

Training sessions throughout the three days included energy and water security, solid waste management, sustainable procurement, environmental compliance, real estate, and cultural resources management. Participants appreciated a variety of learning opportunities, from tours of Arizona State University's campus sustainability initiatives to hands-on technology tutorials.

James Hessil, chief of the Environmental Division at Fort McCoy's Directorate of Public Works, said he was inspired by his experience. "I thought the training was an excellent opportunity to interact with Army Reserve personnel from Readiness Divisions and Installations and to learn from other's best management practices and successes," he said. "I also thought it was an excellent idea to have Arizona State University host the training because it allowed us to learn sustainability from one of the best institutions in the world."

"The Army Reserve has much to be proud of in the last five years on our path to becoming a sustainable world-class organization," Wirt said. "But, this training has highlighted to the participants that there are so many more opportunities that we need to embrace.

I believe that the participants left [the training] with a more collective vision of where we need to focus our efforts and how each one of us has a critical role in those efforts. Leveraging and building on partnership both within our communities and with outstanding institutions like Arizona State University if incredibly important for our overall success."

Learn more about Army Reserve sustainability initiatives at sustainableusar.com

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Kimbrough is the communications coordinator, Army Reserve Sustainability Programs.

Acronym study leads to the history of SOTIM at WSMR

by Bill Godby

As anyone who works for the military knows, encounters with acronyms are a way of life. At a military test facility such as White Sands Missile Range, New Mexico, or WSMR, the creation of acronyms runs rampant.

My job as an archaeologist at WSMR includes investigating our rich Cold War era past and the physical remains from the many incredible things accomplished during that time. These "investigations" result in reports that provide the nuts and bolts of what was achieved and how important it was or wasn't historically. The physical remains don't tell the whole story.

Fortunately WSMR has the Museum archives, the old issues of the installation newspaper *Wind and Sands*, and of course, the best resource is the old timers who have spent their lives here. This is how folks like myself can make sense of these remnants of WSMR history. Living amongst all of this are the acronyms that no one fully remembers. For this article we find SMSA or Signal Missile Support Agency, WSSA or White Sands Signal Agency, ERDA or Electronic Research and Development Agency, and the topic of this article, SOTIM.

All of the above acronyms are old business, no longer used, except SOTIM. There are six SOTIM sites still listed on our range map. Environmental Division staff have been out to them and they are often used as reference points. However, no one in our office could tell you what a SOTIM was, until recently. SOTIM is the acronym for the Sonic Observation of Trajectory and Impact of Missiles. SOTIM is described in a 1962 WSMR Capability Summary as follows:

"The pressure disturbances generated by a missile as it passes through the atmosphere at velocities in excess of sound are detected by ground based stations and translated into data which are used to determine trajectory and impact of the missile. The system is passive, has a high order of reliability, and is able to provide impact information on supersonic objects. The system is of particular value on small research rockets which ascend to great altitudes, and which, because of size, are unable to carry beacons and reflectors to aid in tracking".

The SOTIM control room was a very elaborate operation when it was in use in the early 1960's at White Sands Missile Range, New Mexico. (Courtesy photo)

SOTIM was used for Athena, Aerobee, ARCAS, LOKI, Nike, as well as other high altitude and upper atmospheric rockets. The system is complementary to radar data collection.

On the ground the SOTIM station was quite simple. It consisted of four holes in the ground to accommodate four microphones spaced about 1,000 feet apart. Each microphone was suspended from a circular steel grate and placed over the hole. Later refinements occurred with raised mounds and cement lining for the device, probably due to moisture and critters. Data collection from the devices most likely occurred from a trailer.

The concept and design appears to be the outgrowth of research being carried out by Schellenger Research Laboratories with funding and direction coming from the Signal Missile Support Agency. Schellenger Labs was very involved in developing acoustic sensing equipment and was founded at Texas Western College in 1953 (later becoming the University of Texas at El Paso). The research included a significant military component to include rocketry, environmental acoustical testing and telemetry systems. It was the acoustical testing that led to the development of the SOTIM.

Understanding who was responsible for the SOTIM program was a bit of a challenge. Here is where the acronyms come to life. Under the big umbrella of SMSA lives WSSA, and under that is the Missile Geophysics Division (later to become the Meteorological Division), which operated the system, collecting and analyzing the data. ERDA appears to have been largely involved in tweaking the system, fixing the parts, adding new parts, largely hardware modifications. In 1955, there were eight SOTIM stations. Due to their success and accuracy, another nine were constructed by 1962, totaling 17 SOTIM sites covering the entire range.

In the early stages of operation, data had to be collected from the individual SOTIM

(See Acronym Study, on page 40)

Contractors remove decades-old buildings at Fort McCoy

Story and photo by Scott T. Sturkol

FORT McCOY, Wisconsin – Two rows of decades-old buildings are being removed on Fort McCoy's cantonment area near the old main gate area.

The overall task order for building demolition includes 12 buildings - 2118 -2197 and 2140-2148, said Mark Nelson, construction inspector with the Directorate of Public Works, or DPW.

The task order was awarded as part of an indefinite delivery, indefinite quantity demolition contract, Nelson said.

"(The) order was awarded in August to Alliance Steel Construction Inc. with a value of $316,414," Nelson said. "The project requires removing the two rows of buildings as well as their foundations."

DPW Director Liane Haun said Fort McCoy is following a congressionally mandated requirement of a one-for-one demolition for new major military construction with the loss of the older buildings.

All new military construction projects must demolish an equal amount of square footage that is being constructed as part of the project, Haun said. In this case, Equipment Concentration Site-67 and the Fort McCoy Central Issue Facility were a part of this row of buildings and are now in new facilities.

Master Planner Brian Harrie with the DPW Master Planning Division said the work is part of a larger effort that will turn the entire area into a transportation marshaling yard supporting installation rail operations.

"Long term, the demolition of all the buildings in this area will free up more space to further develop Fort McCoy's Transportation Area, with improved staging, marshalling, and railroad capabilities," Harrie said.

Much of the demolition materials are being recycled on and off post, Nelson said. The concrete, for example, was moved to a concrete recycling staging area on North Post.

Hundreds of tons of concrete recycled at Fort McCoy each year find new purpose as material to create a road base or upgrade tank trails, said DPW Water and Wastewater Branch Supervisor Michael Miller.

Military installations such as Fort McCoy, Miller said, have many types of waste streams. Old concrete is part of the construction and demolition (C&D) waste stream, which also must have a recycle rate of at least 50 percent.

"About 85 to 90 percent of the C&D waste weight is concrete," Miller said. "So by recycling and reusing that concrete alone, we are surpassing that 50 percent goal."

Workers with contractor Alliance Steel Construction Inc. of Superior, Wisconsin, remove debris of an old building Oct. 20, on the cantonment area at Fort McCoy, Wisconsin. The contractor removed 12 buildings as part of a task order coordinated by the Directorate of Public Works. Much of the materials from the demolition, especially the concrete, were recycled for other uses.

DPW General Engineer John Adams added that when a demolition is done, concrete gets hauled up to a holding area on North Post.

"When there is a sufficient accumulation of concrete and materials that need to be crushed and recycled, we cut a task order to have a contractor come in and get it done," Adams said.

Completion of the current demolition was to be fully complete in November, Nelson said.

Fort McCoy has supported America's armed forces since 1909. The installation's motto is to be the "Total Force Training Center." The post's varied terrain, state-of-the-art ranges, new as well as renovated facilities, and extensive support infrastructure combine to provide military personnel with an environment in which to develop and sustain the skills necessary for mission success.

Learn more about Fort McCoy online at www.mccoy.army.mil, on Facebook by searching "ftmccoy," and on Twitter by searching "usagmccoy."

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Sturkol is with the Fort McCoy Public Affairs Office.

Researchers investigate residues from live-fire training

by Marie Darling

HANOVER, New Hampshire – Researchers with the U.S. Army Cold Regions Research and Engineering Laboratory, or CRREL, here are working to cleanup military munitions residues and, in turn, the environment by measuring detonated munitions residues and munitions efficiency.

The use of live munitions on training ranges can result in the deposit of residue at firing positions, disposal points and down range impact areas. To determine the impacts of live-fire training, CRREL researchers are investigating the deposit of this residue with new technologies to address accumulation, characterization, fate and transport.

CRREL has developed standards, protocols and innovative tools to measure and characterize contamination levels across active and legacy training ranges. Advanced technologies, such as three-dimensional micro-computerized tomography, specialized surface photomicrography and Raman spectroscopy enable CRREL to physically characterize propellant and explosive residue particles.

Researchers Michael Walsh and Matthew Bigl recently traveled to Picatinny Arsenal, New Jersey, to brief the Armaments Research, Development and Engineering Center's program managers and other interested program and office leads on the results of joint tests conducted at Joint Base Elmendorf-Richardson, Alaska, by CRREL and the Armaments Research, Development and Engineering Center.

The briefing, included a discussion of tests, results, implications, recommendations and potential continued research, while detailing CRREL's expertise in the testing and delivery of data on post-detonation residue and associated determination of munitions efficiency.

"This munitions work is the basis of all range sustainability models and is beginning to be used to assess munitions efficiencies," Walsh said. "The knowledge gained from our testing is also being used by our NATO and European allies for development of range sustainability programs."

CRREL's techniques, tools, methods and protocols for munitions residue characterization and analysis are currently the standards for military training land and firing range investigations. This research into energetic compounds and propellants in the environment is applicable to cold and temperate regions and both military and non-military lands.

More information about this program is available at http://www.environmentalrestoration.wiki/index.php?title=Energetics_Deposition.

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(Acronym Study, continued from page 38)

site, involving a great deal of effort and of course labor costs. However in 1956, when only eight stations were operational, Pfc. William Howard developed a method to remotely control all stations, eliminating the need for going physically to each site. Subsequently, small metal buildings were added to the SOTIM sites to house data collection equipment. The June 7, 1957, issue of *Wind and Sands* states that "Howard's remote control system provides manpower savings of 500 hours a week in busy periods and releases six vehicles needed in the old system". Howard's efforts resulted in savings of $40,000 ($350,000 in 2017) and was awarded first prize of $150 ($1,300 in 2017) in the Military Incentive Awards.

The initial remote SOTIM control facility was operated at the ALA-1 (now Launch Complex 33). It was later moved to the Small Missile Range, as the SOTIM program was operated under the Missile Geophysics Division as many missions involving atmospheric testing and conditions occurred there, with very elaborate control rooms such as the one use for SOTIM.

In doing further research on Schellenger Labs and the refinement of the SOTIM system, I learned that winds played a significant role in the data collection. Data collected from each of the microphones had to be modified to accommodate the effects of wind drift on sound. Additionally, multiple electronic modifications were made to the data collection device module during a five-year period. During my research I was reminded that, as with most of the technologies developed at WSMR, the SOTIM was a moving target, being constantly improved and tweaked to become state of the art. I have not been able to ascertain when the SOTIM system was no longer needed. Clearly it was fully operational in 1964, as the photos have documented. Its lifecycle starting in the mid-1950s and lasting at least until 1965 or later is outstanding in respect to other technologies that were rapidly superseded in this time frame.

As is the case with all our research on the rich Cold War history at WSMR, many things are discovered along the way. I have discovered that the organizational history of WSMR is complex. The continual evolution of agencies, the creation of more acronyms, makes it difficult to document historically. As for SOTIM, we now have enough information to adequately document and interpret what is left of these facilities and to provide a reasonable historic context to accompany our reports. Fortunately at one site a microphone and the circular grate were recovered and has been provided to the museum, along with background information on their use.

The SOTIM and its story will not be forgotten.

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Godby is an archaeologist with the Environmental Division, White Sands Missile Range, New Mexico.

Announcing new Master Planning PROSPECT courses for FY18

by Jerry Zekert and Holly Workman

Are you curious about how to effectively contract and negotiate for master planning services? Do you need to know how to manage a master planning program? Or are you interested in learning how to develop a form-based plan and techniques required to implement the master plan?

Develop your master planning skills and make more informed decisions with our two new Proponent-Sponsored Engineering Corps Training (PROSPECT) courses: Master Planning Practices (Course #241) and Master Planning Programming and Siting (Course #326).

Master Planning Practices #241

This four-day course focuses on the practices needed to efficiently manage a master planning program including accomplishing planning efforts, contracting for planning services, balancing contract efforts with in-house capabilities, evaluating work, and ensuring stakeholder involvement.

The course provides a brief overview of the master planning policies and products required by United Facilities Criteria 2-100-01, Installation Master Planning. Divided into four sections, students first learn about individual and collective roles and responsibilities for project managers, stakeholders, planning boards, and planning support centers. Included is a segment on planning law and ethics where students gain an understanding of how legal precedence and ethical actions impact planning practices.

Students learn in an interactive hands-on setting how to ensure quality in the planning process through the development of effective statements of work, the preparation of reasonable government working estimates, and the appropriate evaluation of master planning products (e.g., Vision Plans, Installation Development Plans, Area Development Plans, Planning Standards, Development Programs, and Plan Summaries, Sustainability Component Plans, Nodal Development Plans, and Customer Concept Documents).

The course also teaches how Design Agents can effectively execute work for customers through appropriate acquisition strategies that may include in-house efforts, jointly with Architecture and Engineering (A/E) firms, or by contracting all the effort to A/E firms. Through hands-on exercises, this section also teaches students how to manage the A/E selection process by crafting appropriate solicitation notices, evaluating proposals, interviewing firms, and making the selection.

Master Planning Programming and Siting #326

Master Planning Programming and Siting will be first offered in 2018. This course combines two popular PROSPECT courses: Master Planning Guideline Implementation (319) and Master Planning Program Execution (326). This four-day course provides a broad understanding of the concepts and elements of form-based planning and methods used to implement master plans.

The course's primary purpose is to teach master planners, designers, and project managers how to prepare a form-based code and an Area Development Execution Plan for a planning district. This course uses an interactive charrette model to teach students how to prepare a form-based code, use the code, and enforce the code in managing installation development. Students also learn how to interpret the code in the design and programming of projects.

Through hands-on learning, this class enables planners, designers, and project managers to be able to develop a form-based code that includes illustrative and regulating plans as well as a suite of planning standards for streets, buildings, and landscapes. Students also learn how to process site approvals using the form-based code, create regulatory protocols, and understand the integration of the code into the overall master planning process.

Students learn how to implement Capital Investment Strategies through the preparation of an Area Development Execution Plan. The course highlights tested methods to prioritize projects and ways to develop planning-level cost estimates. This class is not a programming or DD Form 1391 development class. Nor is it a computer class on how to use Real Property Planning and Analysis System, Army Stationing and Installation Plan, or similar tools. Instead, this course covers how to use the output of these tools and the planning process to develop Area Development Execution that can be used for plan implementation.

The USACE Learning Center manages PROSPECT courses, registrations and provides details of the process. The program allows both public and private professionals to register for courses, although priority registration remains for Corps of Engineers and federal employees. Course listings and 2018 academic offerings are available online at: http://ulc.usace.army.mil/downloads/PurpleBook2018.pdf or to register, contact Anthony Edwards, USACE Learning Center Course Manager at anthony.edwards@usace.army.mil. Contact your training coordinator to request classes. Please note that schedule and locations are subject to change.

Editor's Note: *See the 2018 Master Planning Training Schedule on page 42.*

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Zekert is the chief of the Master Planning Team at Headquarters, U.S. Army Corps of Engineers, and director of the PROSPECT Master Planning Courses. Holly Workman, ACIP, is a planner at The Urban Collaborative, LLC, and PROSPECT Course Instructor.

2018 Master Planning Institute Training Program

Date	Course #	Description	Place	Tuition
13-16 March	258	MP Energy & Sustainability	New Orleans	$1,513
18-20 April		Federal Planning Workshop	New Orleans	
21-24 April		American Planning Assn Conference	New Orleans	
24-26 April	163	MP Sustainability & Resiliency	Champaign, Illinois	$1,545
08-11 May	241	MP Practices	Mobile, Alabama	$1,564
04-07 June	075	MP Principles	San Francisco	$1,535
10-12 July	392	MP Sustainable Historic Structures	Cincinnati	$1,081
23-24 July	319	MP Guideline Implementation	Kansas City	$990
25-27 July	326	MP Program Execution	Kansas City	$1,089
07-10 August	948	MP Visualization Techniques	Huntsville, Alabama	$1,560
21-24 August	952	MP Advanced Techniques (ADP's)	Norfolk, Virginia	$1,733

REGISTRATION: If you have questions about **registration, payment, or course specific questions**, contact the Registrar office at: (256) 895-7425 / (256) 895-7422 / (256) 895-7437 / (256) 895-8086 or **Fax:** (256) 895-7469. The Registrar's name is Mr. David Tollison, email: david.d.tollison@usace.army.mil

Course Proponent: Jerry Zekert, Chief Master Planning Program, HQ USACE, 202-761-7525; email: jerry.c.zekert@usace.army.mil

Alternate: Sean Martin, AICP, Senior Planner, HQ USACE, 202.761.1876; email: sean.l.martin@usace.army.mil

USACE Learning Center Course Manager is Mr. Anthony Edwards, (256) 895-7495, Fax: (256) 895-7412; email: Anthony.t.edwards@usace.army.mil or Dr. Crystal Navies, Chief, Installation Support Training Division, (256) 895-7477; Fax: (256) 895-7412; email: Crystal.navies@usace.army.mil

For registration to the Federal Planning Division Workshop, the website is https://www.planning.org/divisions/federal/conference/

A time to say 'Thank you' and 'Farewell'

This is a short note to say Thank You and Farewell after a two-year term as managing editor of the *Public Works Digest*.

It is with mixed feelings that I say goodbye as serving as managing editor of the *Public Works Digest* and transition into retirement. Serving as the *Public Works Digest* managing editor was a job that I eyed for much of my 20 year career with the U.S. Army Corps of Engineers. When I first began working at the Headquarters Corps of Engineers public affairs office in the mid-1990's, I was introduced to the *Public Works Digest* and thought that being its managing editor would be a great job. It took me almost 20 years, but I finally got the opportunity and soon found out I was right!

I have learned so much these last two years about how U.S. Army installations run – the innovative and creative programs being designed and implemented by those who keep installations humming. During my husband's 22 plus years on active duty, we lived in Army and Air Force housing for many of those years, experiencing many of your efforts first hand. Since then I have worked with numerous dedicated professionals in the installation support, energy, sustainability, environmental and public affairs fields, all with one thing in common – keeping the Army resilient and ready.

As I retire, I will cherish the time I spent guiding and editing the *Public Works Digest*. I hope I have made a small contribution to maintaining the quality of this fine publication.

As many Army publications gone off into the sunset, I'm proud to say that the *Public Works Digest* continues to be published on a quarterly basis, providing news and professional development information to the installation support community. During the next several years, the way the *Public Works Digest* is distributed may change, but I know it will endure as I firmly believe its readers still find it of value.

Please continue to send in your articles, photos, and graphics to editor.pwdigest@usace.army.mil as the new managing editor will be looking for Environment and Sustainability articles on or about March 2.

Thank you for letting me contribute in some small way to the success of the *Public Works Digest*!

Candy Walters

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