

Updating the Army Facilities Components System

By Lieutenant Colonel Robert C. Steiger

While the World War II-era wooden theater-of-operations buildings are almost a thing of the past on Army bases today, the designs still live on in the Army Facilities Components System's (AFCS's) family of documents. However, the 416th Engineer Command (ENCOM), Darien, Illinois, is leading a project to modernize some of the AFCS designs. The AFCS is the military engineering construction-support system for planning and executing theater-of-operations construction. To the average engineer soldier, it is still a catalog of Army designs for facilities such as base camps and components such as guard towers.

The project to modernize some of the AFCS designs has two parts. First, add to the AFCS-specific designs for Southwest Asia facilities and components, such as sunshades, that are not found in the AFCS today. Second, modify some existing designs to use alternative construction materials that are more prevalent, are available faster, and cost less in the Southwest Asia area of operation. We are focusing on replacing lumber with materials such as concrete-masonry-unit block, plastic or steel pipe, and fabric.

The Beginning

This project originated in late 1998, when part of the 416th ENCOM's Forward Cell deployed to Kuwait to support Army Central Command (ARCENT)—the Army's component of Central Command (CENTCOM)—during Operation Desert Fox. This operation, the response to Iraq's threats toward Kuwait, involved the deployment of more than 4,000

soldiers to Kuwait to build a deterrence force. The Forward Cell was involved in providing facilities for the reception, staging, and onward integration (RSOI) of the soldiers.

We turned to the AFCS for already designed facilities and components but found them unable to meet the needs of the deterrence force. The AFCS designs for facilities to support troops in the field—such as field showers, latrines, guard towers, and administration buildings—were too lumber-intensive and too permanent. The designs were for “temporary” facilities, with a useful life of at least 24 months. What we needed were facilities that met the “initial” standard, with a useful life of 1 to 6 months.

The AFCS had not been updated to include the facility components designed and built during and after Operations Desert Shield and Desert Storm that were Southwest Asia-specific. We couldn't even find designs for some basic facilities that we needed. So ARCENT and the 416th ENCOM had to quickly redevelop designs, specifications, and scopes of work for initial standard facilities and components.

The Project

The after-action report for Operation Desert Fox recommended that designs for RSOI facilities applicable to the Southwest Asian environment be institutionalized. The report specified that designs for both initial and temporary facilities (as defined in Joint Chiefs of Staff Pamphlet 4-04, *Joint Doctrine for Civil Engineering Support*) be included.

In addition, the CENTCOM Engineer Working Group (composed of engineers from all of CENTCOM's subordinate services) also recommended that the AFCS designs be updated and modified to use alternative construction materials and techniques found in Southwest Asia and asked that force protection be included. We nicknamed the project the “Top 20 Project,” because we focused on 20 generic facilities and components that are used most by all services (Army, Navy, Air Force, and Marines) in Southwest Asia. Examples are sunshades, showers, latrines, and maintenance hardstands.

Involved in this project are the U.S. Army Corps of Engineers (USACE) Transatlantic Program Center (TAC); the Engineering and Support Center at the Huntsville, Alabama, Division of the Corps of Engineers; the 416th ENCOM's Forward Cell; and the 416th ENCOM's facilities engineering design team. The TAC provides engineering, construction, and contracting services for the Army and Air Force in CENTCOM's area of responsibility and beyond. It is the best source of institutional knowledge of U.S. government-financed or -managed construction in the Middle East. Its forerunner, the Middle East/Africa Program Office, was a key element in the USACE's engineering and construction accomplishments before and during Operations Desert Shield and Desert Storm.

Huntsville's Engineering and Support Center developed and manages the PC-based Theater Construction Management System (TCMS) for construction planning, designing, managing, and

reporting (see sidebar). The TCMS, which is used for contingency construction, has proven to be an important system for engineer brigades, groups, and battalions. To find the AFCS drawings and specifications, it is no longer necessary to leaf through the large paper Technical Manuals 5-301 and 5-302, *Army Facilities Components System—Designs*; and 5-303, *Army Facilities Components System—Logistics Data and Bills of Materiel*. Now, units can load the TCMS program and, with AutoCAD® LT, pull up the complete design packages and even issue construction directives from the program. The TCMS makes it easier to ensure faster distribution and use of the latest AFCS changes.

When the 416th ENCOM began the project to update the AFCS designs, the first step was to solicit input from each of the services as to its recommendations for the 20 most used generic facilities and components. We found that we really needed to expand the number beyond 20 to capture all of the most frequently used facilities (see chart, page 18).

The next step was to contact the TAC to see what designs existed for facilities or components constructed during or since Operations Desert Shield and Desert Storm, such as sunshades, that met our requirements. The TAC had a plethora of designs for temporary standard and permanent facilities but very few that could meet the austere design criteria for the initial standard. We contacted personnel at Huntsville's Engineering and Support Center to inform them of this project and find out how difficult it would be to modify the TCMS and the AFCS to add these Southwest Asia-specific facilities and components to the family of designs. Personnel at the center were very responsive and eager to add these facilities.

The project officer for the Top 20 Project then assigned a source of the design, specifications, and bill of materials (BOM) to each of the items. For some items, we could quickly procure the design from TAC because it had already been used in the area of operations to build a facility or component. All the 416th

ENCOM had to do was produce the specifications and check the BOM. For many other items, we turned to our facilities engineering design team to either modify an existing design or complete the package for an existing design by developing the specifications and BOM.

A good example of this is the familiar "burnout latrine" from the Vietnam War. The design was modified to replace some wood structural members with plastic or steel pipe. The walls are no longer plywood but are fabric—whatever locally made fabric is available. Although we haven't totally eliminated wood in the projects, we have drastically reduced the amount of plywood needed.

As each design package is finished, engineers with area-of-operations experience review the package to ensure that it is complete and understandable. To date, the 416th ENCOM has completed three of the design packages and is staffing them. The next step is to electronically send each design package to Huntsville to be included in the next versions of TCMS software. So start looking for the first of the new Southwest Asia-specific design packages later this year.

The Results

By modernizing some of the AFCS designs with the Top 20 Project, the 416th ENCOM, the Transatlantic Program Center, and Huntsville's Engineering and Support Center are on the way to making it easier for engineers deploying to Southwest Asia to provide facilities and components to deployed soldiers much faster than before.

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Theater Construction Management System

By Sergeant First Class Brian Nering

Modern Army engineers have a multitude of automated aids to make their job easier. The Theater Construction Management System (TCMS) is one of these aids. Used in conjunction with AutoCAD® LT, the TCMS is a computer-based system for planning construction projects. The system includes design, management, and reporting capabilities.

The TCMS was designed to replace Technical Manuals 5-301 and 5-302, *Army Facilities Components System – Designs*; and 5-303, *Army Facilities Components System – Logistics Data and Bills of Materiel*. These manuals include "blueprints" and schedules for projects ranging from latrines to base camps. The goal was to provide construction units with examples of projects that had already been used in the field. In other words, civil engineers would not have to design a base camp from scratch; they would simply copy the required drawings, make any necessary changes, and start building.

The primary military occupational specialty involved is 51T, technical engineer. The 51T course is taught at Fort Leonard Wood, Missouri, to members of all branches of the military. The 18-week, technically intense advanced-individual-training course is comprised of drafting, surveying, and materials-testing skills. At the beginner level (10), students are taught to search, modify, and print drawings properly. Considering the current inventory of 4,800 plans to choose from, proper search techniques are critical.

In the TCMS—under the "Facilities" pull-down menu—type either a "noun" or short "description" to search for like projects. After locating the desired project, open the drawing file in AutoCAD LT and save it as a separate file. Then changes can be made to the drawing for site conditions or other requirements specific to that project. Currently, personnel at the staff-sergeant level (30) are responsible for determining required changes. The next step is to generate a bill of materials (BOM) needed to build the structure.

It's easy to see how the TCMS has become a time and labor saver. Projects that once required cumbersome technical manuals and a chest of flat files are now on a CD. As always, time is a valuable asset to mission accomplishment, and the TCMS is now "time saved" for the military.

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**Top "20" Projects
Southwest Asia Area of Operations**

	Project	Description	Concept
1	Aircraft maintenance	An arch-span metal building	Various aircraft sizes
2	Ammunition supply point	An earth-barricaded ammunition-storage point	
3	Barriers	A concrete vehicle-barrier checkpoint	Placed at gate entrances; reinforced concrete; relocatable; "Jersey" and "Texas" sizes (3 feet and 6 feet high)
	Barriers	A 55-gallon drum vehicle-barrier checkpoint	Placed at gate entrances; filled with water; relocatable
4	Base-camp layout	A site-layout design for a 1,000-man Kaabal	Layout using the above facilities
5	Berms	Perimeter base-camp berms	Six-foot-high earth berms to provide blast protection and wheeled-vehicle barrier
	Berms	Aircraft, helicopter, and Patriot battery protection	Eight-foot-high, sand-grid walls or fabric-lined wire baskets (filled with sand and gravel)
6	Bulk fuel	A bulk-fuel storage and transfer point	Inland petroleum-distribution system (IPDS) feed and truck feed, with earth berms for spill protection; unit provides collapsible bags, piping, and pumps
7	Bunkers	Protective personnel bunkers	SCUD bunkers; reinforced-concrete box culvert, 5 feet high, 8 inches thick, sandbag sides and top, sandbagged Jersey barriers on the ends
8	Displaced-civilian camp	A 5,000-man camp	Layout using the above facilities
9	Electrical-power grid and lights	Electrical-power grid and lighting for a 1,000-man Kaabal	Power cables elevated on timber scissors, with relocatable exterior lights; electricity from 2- by 100-kilowatt generators (1,650 amperes at 120 volts)
10	Enemy-prisoner-of-war camp	A 5,000-man camp	Layout using the above facilities
11	Hardstand	Rough-terrain forklift capable	An area 100 by 100 meters; gravel surface, 6 inches thick; upgrade with 6 inches of concrete
12	Helicopter fueling point	A forward-area arming and refuel point (FAARP)	CH-47-capable, using dust palliatives for dust control
13	Helicopter landing pad	CH-47- and UH-60-capable versions	A concrete pad, 8 inches thick, with tie-downs; dust palliative around pad
14	Latrines	A three-hole field latrine	Wood frame; fabric siding; metal burnout barrels; relocatable
15	Latrines	A one-hole field latrine (foldable portatilet)	Plastic siding, fabric hinges and snap construction for quick assembly; relocatable; requires sewage service
16	Latrines	A three-tube urinal	PVC pipe in gravel sump
17	Petroleum pipeline	An IPDS (pipeline)	
18	Shower/latrines	A shower/latrine trailer	Eight shower stalls and 8 toilet seats in a 40-foot trailer unit, with sinks and water heater; liftable; requires nonpotable running water, gray-water disposal, and sewage collection
	Showers	Two- and three-stall portable field showers	Wood frame; metal water storage; nonpotable water; relocatable; thermostat-controlled heating elements
19	Showers	Shower trailer	Sixteen shower stalls in a 40-foot trailer unit, with sinks, and water heater; liftable; requires nonpotable water and gray-water disposal
20	Sunscreens	Prefabricated metal building	Without walls; various sizes; capable of storing MILVANS stacked two high
21	Tent pads	A 4-inch gravel hardstand; upgrade with a 4-inch lean concrete slab for tent pads	Concrete pad kept thin and low strength to retain initial standard
22	Towers	Two-man guard/observation towers around perimeter and checkpoints	Steel frame preferred; 10-foot towers (from ground to top of floor); sandbagged sides and top
	Wash basins/shaving stands	Water tower	Steel frame preferred; for nonpotable water; unit provides a 3,000-gallon collapsible bladder; platform elevated to 10 feet