THEATER CONSTRUCTION MANAGEMENT SYSTEM: TIME TO RAISE THE STANDARDS

By Lieutenant Colonel Joseph D. Tyron

By now many senior engineer leaders have completed one or more tours in Afghanistan or Iraq and have been responsible for construction on one level or another. As many of us return for a second or third tour, we often go back to see the legacy we left. Some of us marvel at our work, while others think, "If I could do it over again, I would do it differently." We are now at a point where we need to challenge the presumption that our standards for theater of operation construction have been correct. Does it make sense in the Central Command (CENTCOM) area of responsibility to build structures out of wood? This article will give some reasons why we have pursued this current course and why we should change our policy and perhaps our doctrine as they relate to the counterinsurgency fight. It also leads us down the road of how we need to train our junior leaders to be successful in fighting our current and most probable future conflicts.

Most engineers have been involved in troop construction in Afghanistan and Iraq and have seen a lot of problems with continued construction of wooden buildings in the harsh desert environments. The larger problem is that the temporary nature of these structures may send the wrong message to our coalition partners, as well as our enemies, about our commitment to win. One could argue that an American force that builds structures like Southwest Asia (SWA) huts is not committed to fight a long counterinsurgency or commit to a national support effort.

Beyond the question of appearances, there are many other valid reasons to build structures that endure. We should change our materials from wood to local materials for several reasons: availability, suitability, and transportation of materials; pest problems; fire protection issues; and protection from indirect fire. Using local materials solves many of these issues and also addresses questions of life-cycle costs, quality-of-life issues, transportation limitations, economic stimulus through procurement of materials and labor, and the issue of eventual transition of facilities to the host nation.

History

How did six months become the expeditionary standard for construction? Over the past 30 years, very few conflicts or operations have lasted less than six months. In Vietnam, most U.S. forces operated out of forward bases that were built to expeditionary standards but which always had logistics and support bases that were designed for 5- to 10-year operations. Even shorter conflicts such as Desert Shield and Desert Storm lasted longer than six months. As we continue operations into the seventh year in Afghanistan and the fifth year in Iraq, it is time to challenge these standards and build the structures we need for the wars we actually fight.

20th Engineer Brigade combat patch

When I attended the Engineer Officer Basic Course in 1991, we were on the cusp of the revolution of automation at the tactical construction level. The traditional method used the Army Facilities Component System (AFCS) charts to plan and design. The charts, with ¾-size drawings of SWA huts and other standard structures, were used to determine

bill of materials requirements, additional tools required, haul assets, and projections for man-hours. Most of us were told that we would soon be migrating to the Theater Construction Management System (TCMS), which would automate the process with embedded computer-aided design and scalable and site-adaptable drawings. It was a great improvement over AFCS, but it was decided that our focus as engineers would be on breaching and mechanizing our force. I remember a senior engineer leader asking me, "Do you want to be a plumber or a killer?" That philosophy worked during Operation Desert Storm, but has not been effective during Operation Iraqi Freedom and Operation Enduring Freedom. I'm sure today's senior Army leaders would prefer that engineers be as good at plumbing as they are at killing.

During the late 1980s and early 1990s, the time we should have devoted to construction was diverted to training on combined arms breaching and other tactics used at the National Training Center at Fort Irwin, California. Sadly, much of the construction program of instruction in our professional military education courses was deleted. A six-month facility lifespan for an expeditionary theater construction standard persisted even though we moved toward many missions that would have inherent reconstruction tasks.

The Roman Empire was one of the greatest of all times. There can be arguments about territorial gains, military conquests, and advancements in science, law, culture, and architecture, but few historians would dispute the idea that the Romans mastered all things in their sphere of influence. Of particular note was the Roman commitment to building throughout their empire. Nearly everywhere they went, they left lasting structures. One important idea from Roman military operations is relevant to the theater of operations construction standards today: the building of high-quality, long-lasting infrastructure in contested territories. Roman legions built great structures, roads, aqueducts, and permanent structures using locally available labor and materials. These structures contributed to the material welfare of the province or territory but also left a more lasting influence on the local culture's architecture and social organization.

We are certainly not the Romans, but we can take a lesson from the legions on building structures to last. What does a six-month life-cycle structure say about America and our commitment to the region? Clearly, whether it is popular or not, nation stability operations and reconstruction operations are going to be in our doctrine in order to terminate wars in a way that actually achieves our political objectives and allows us to engage and support emerging allies.

As obvious and logical as the historical reference may be, we still primarily use wooden structures for coalition facilities in Afghanistan and Iraq. Let us look at the reasons of concern over this standard of construction.

- Wood is not a building material found in large quantities in Afghanistan, Iraq, or the Horn of Africa. It doesn't hold up well in harsh, dry climates where intense heat and low humidity distort wood and cause quality problems.
- Central Asia and Iraq are arid regions and lack water resources and infrastructure. With that in mind, we need to take fire protection more seriously. Fires in wood

Soldiers from the 20th Engineer Brigade prepare to deliver wood throughout the battlefield to support engineering projects.

structures and tents can be devastating, and the danger doesn't have to come from a careless Soldier; it can be poor electrical work or indirect fire.

- Termites are an unseen threat. On average, we will have termite problems within six to twelve months of building a wood structure in these regions.
- A large amount of costly lift assets is required to move lumber to the region. Our supply lines in Afghanistan and Iraq are long and vulnerable. Class IV supplies are difficult to transport, compete with other high-priority supplies, and put Soldiers' lives at risk by increasing their exposure to dangers on the roads of Afghanistan and Iraq.
- Indirect fires continue to be a problem, and rocket and mortar attacks are an everyday event in both theaters.

Based on these concerns, most people can understand why our system should change, but to what standard and when? There is a time and place to use wood, but it is more cost-effective to go directly from tents to concrete and block buildings. It will be helpful to qualify a couple of inverse rules that apply in Afghanistan and Iraq. First, local labor is cheap and materials are expensive. Of course this seems obvious, but in the United States it is completely the opposite. Second, construction materials may not always be readily available and lead times are longer than in the United States or Europe. Seen through this lens, it will be easier to understand the logic of some of the following arguments.

In our current active theaters, the predominant local construction material is not wood but block and stone. Block and concrete construction is ideal for the environment in the Middle East and Central Asia. It is the predominant medium for most commercial construction. There are not many wood structures in Afghanistan and Iraq because wood has primarily been for support components and fuels in these countries. All dimension lumber has to be imported, but block is made nearly everywhere in the Middle East and Central Asia. Cement and rock products are in abundance all over the region, and there is an experience base in working with these products. Although their techniques make less efficient use of labor than our own, this is not a serious problem since labor is the least expensive component of the construction process and a coalition goal is to maximize local labor.

Aside from the obvious cost of building and rebuilding with wood, the issue of operations and maintenance rears its head. Every time a wood structure has to be rebuilt, there is a need to rewire and replumb. This raises the costs exponentially, and the problem is worse when we consider we are working on the third iteration of facility rebuilding or replacement in many locations. In some instances, Afghan and Iraqi soldiers have better facilities than American Service members.

Protecting wooden and light metal facilities from indirect fire is costly, but that problem could be solved by constructing buildings with block and concrete deck roofs. This would lower the risk of fire hazard and conserve fire protection assets while protecting our forces against mortar, rocket, and artillery fire. The problem of construction technique could be overcome with training and supervision to get a good quality product. It would also cut down on transportation costs, because block can be produced on-site and in the local economy. Instead of having to buy the most expensive imported building materials available in the overseas market, U.S. forces could buy inexpensive, locally-produced building materials right outside the gate. U.S. forces are constantly looking for programs to stimulate economic development in nation-building operations. Unfortunately, sweeping streets and cleaning canals does not do enough to stimulate an economy. If we employed more local nationals and taught them to build to Western standards, the benefits would be immense. In addition to improving war-ravaged countries, it could create a workforce that could move throughout the region and help contribute money to the economies of their home countries. This can be seen in the large numbers of third-country nationals working in Korea, Turkey, Indonesia, China, Saudi Arabia, and Egypt.

In a previous assignment with the United States Army Corps of Engineers (USACE) in Afghanistan, we built many of our projects for the Afghan National Army (ANA) with local materials such as stone and with cement block made on-site. The projects employed more than 5,000 Afghans across the country and gave the ANA lasting facilities.

The last and most important outcome of using local materials might be transition, because that is our ultimate goal in Afghanistan and Iraq. Our ticket out of these theaters of operation is a long-term security apparatus. Changing our theater-of-operation construction standards would provide a short-term sustainment facility for coalition forces and would represent capital in the eventual transition of U.S. forces. A sustainable city with electricity, water, and waste water management would be a much more attractive bargaining chip than a base of aging and dilapidated SWA huts.

The Way Ahead

What is the way ahead for military engineers? First, we need to review and revise construction standards in the CENTCOM Sand Book and the TCMS. Our standards need to be flexible enough to consider all factors. Cost, life cycle, transportation assets, fire protection, force protection, external commitment to our coalition partners, and host nation economic stimulus need to be addressed. Senior leaders should study current theater of operations construction standards in order to rectify the problems addressed in this article.

Second, we need to change our wartime construction paradigm. We should plan to go for the long term—3 to 5 years, including post-conflict operations and stabilization operations—and should adopt a two-prong construction strategy:

- Develop and use expeditionary construction standards in the beginning of an operation, including deployable base camp packages that are already available.
- Plan, develop, and build—in concert with the tactical situation—durable facilities that can be supported with limited assets. Don't build temporary structures that become permanent.

We should modify the CENTCOM Sand Book standards and go to permanent construction sooner, when it is clear that the national commitment will be long-term. Experience demonstrates that this level of commitment is required to achieve war termination or accomplish political objectives.

Finally, we need to update our collective skill sets in our schools to include instruction on building in block and other concrete vertical products. Our technical prowess should meet our tactical prowess on the combined arms team. That means increasing the investment in our training base and working with the latest industry techniques to keep our personnel in step with the construction industry. This change needs to happen in all engineer advanced individual training and officer and noncommissioned officer education courses. Also, at the higher staff levels, we need to send junior officers to assignments with USACE, public works, and prime construction contractors so they can gather best practices and disseminate the knowledge to the Regiment. Some officers in the Engineer Regiment must become warranted contracting officers to give ourselves a self-help capability to advise maneuver commanders on contract expectations and to more aggressively pursue contracting actions. This seems like a tall order, but it is already happening in the combat zones of Afghanistan and Iraq in a variety of assignments. We simply need to document our combat successes and failures and go with what works.

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