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Ten Lessons Learned About Host Nation Construction in Afghanistan

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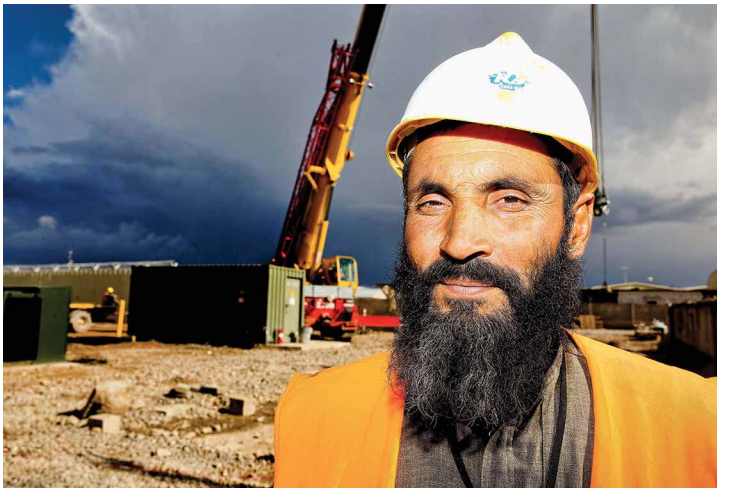
The 26th Maneuver Enhancement Brigade notified me in January 2011 that I was to serve as a design engineer for our bases in Kabul, Afghanistan. That year, *Money as a Weapon System–Afghanistan* (MAAWS-A) was in full effect, and U.S. Army vertical engineers were in short supply.[1] Therefore, the Army relied heavily on Afghan companies for new construction. During the deployment, I was responsible for designing this new construction in the Kabul Base Cluster, projects totaling $170 million. My responsibilities expanded midway through the tour when I assumed the additional role of overseeing all construction operations in the region.



An Afghan contractor poses for a photo while assisting with the removal of blast-resistant concrete barriers 6 November 2013 at Multinational Base Tirin Kot, Afghanistan. Civilian contractors assisted U.S. and Australian troops with the drawdown of the base and the transfer of the remaining facilities to the Afghan National Security Forces. (Photo by Cpl. Mark Doran, Australian Defense Force)

Having no prior experience as a civil engineer, these jobs were well above my expertise. Prior to deployment, my engineering experience focused on vehicles and robotics, with my only civil engineering training being in the Basic Officer Leadership Course (BOLC). So, like any good soldier, I learned, adapted, and overcame.

Over the course of the year, I learned a lot about Afghan construction. The following ten lessons proved invaluable to me and could likewise prove useful for others overseeing construction operations in Afghanistan.

Lesson 1—The Process for New Construction Was Straightforward but Took Time

The process for approving new construction in Afghanistan was similar to that in the United States. The process began with a commander submitting a request for new construction. This was followed by a site survey and a design for the construction project. The project proposal went before a Joint Facilities Utilization Board, where a general officer, who had approval authority for projects under $750,000, could approve it.[2] The money was allocated after the project was approved.

Afghan contractors reinforce the roof of a school under construction 19 January 2012 in Garmsir District, Helmand Province, Afghanistan. Twelve permanent schools were under construction by Afghan contractors in the Garmsir District. A civil affairs team in support of the 3rd Battalion, 3rd Marine Regiment, visited several of the sites to inspect the structures and ensure compliance with the quality assurance standards of the Afghan government. (Photo by Cpl. Reece Lodder, U.S. Marine Corps)

While the money was being procured, a complete set of engineering drawings and a statement of work (SOW) were completed. Those documents became available to Afghan construction companies so they could bid on projects. Interested companies could submit a technical proposal and a bid. We then reviewed the technical proposals. (These were often just reiterations of the SOW for technical feasibility.) Subsequently, the contract was awarded to the company with the most technically feasible proposal and the lowest cost.

Following the award of a contract, there would be a kick-off meeting with the Afghan companies at which time we would go through the SOW, answer any questions, and reiterate key deadlines. A contract officer representative would be assigned for each project with instructions to contact us with any technical issues that arose between inspections. The project would then begin, with a typical period of performance of ninety days, although they typically ran thirty to sixty days over. Over the course of the project, we would have monthly job-site inspections to check progress and adherence to the SOW.

When a project was completed, it would undergo a final inspection, and projects that were on a major base required an additional inspection by the Logistics Civil Augmentation Program (LOGCAP). LOGCAP is a program where an American company contracts logistics support for the military. The LOGCAP included companies such as KBR, DynCorp, and Fluor.[3] In my region, Fluor had the LOGCAP contract. Fluor representatives would inspect the new construction, and, upon a successful inspection, they would take ownership of the upkeep and maintenance of the building.

Expedited projects could go through this entire process in four to six months; however, most projects would take six to eight months. Due to the length of the process, which often overlapped unit deployments,

the majority of our construction was designed by our predecessors. Similarly, the majority of our designs were built by our successors.

Lesson 2—Afghan Companies Often Would Mislead You to Get a Contract

Afghanistan has been in turmoil since the Russian invasion in 1979. With the high level of danger associated with living in an active war zone, many Afghans have developed a Darwinian survivalist mentality and a keen sense of opportunism, especially about competing for money, which is viewed as the key for survival. This ruthlessly competitive impulse was whetted with the appearance of the U.S. Army, which had a substantial amount of money that it was clearly anxious to spend on new construction. Not surprisingly, in the ensuing scramble for money, Afghan companies desiring to secure construction contracts often provided misleading technical proposals and bids. For example, Afghan companies would claim that they possessed capabilities they did not have. Similarly, Afghan companies would agree to schedules that they had no ability to meet.

Afghan contractors help Afghan National Army soldiers build a latrine 7 February 2013 near Takir, Afghanistan. (Photo by 1st Lt. Gerrelaine Alcordo, U.S. Army)

Moreover, as a money-bilking strategy, Afghan companies would habitually belabor the cost of any modifications that were made in our designs. Although our designs went through significant scrutiny, due to the sheer volume of new construction and the short timelines in which such construction was expected to be completed, it was difficult to catch all the planning oversights. For example, we were constructing a two-story barracks building that required a staircase. However, though the drawings included the staircase, the SOW failed to specifically mention it. In response, the Afghan company demanded an additional $100,000 for the staircase. Although we could have had another company construct it for a fraction of the cost, we would have needed to start a new construction process, and the barracks would have been uninhabitable for another six months. So we determined that it was more cost effective to pay the additional cost in the interest of time to meet the mission. The lesson is to ensure the SOW is precise not only for the sake of intrinsic accuracy but also to avoid the necessity of caviling with greedy Afghan contractors who demand outrageous sums to rectify ostensible planning oversights.

Lesson 3—Ownership of "Afghan" Construction Companies Was Often Obscure and Dubious

Opportunism was not exclusive to Afghans. A major collateral intent of MAAWS-A was to put money into the Afghan economy, but some of the construction companies were not owned by Afghans. Although upper-class Afghan citizens owned the bulk of the companies, several were owned by American expatriates who had previously been in Afghanistan as contractors or as part of the military. Such expatriates apparently saw the large amount of money that the Army was willing to pay for projects and the low cost of labor. Consequently,

Navy Lt. Stephen Gustafson, Khost Provincial Reconstruction Team (PRT) engineer, teaches proper masonry supply storage to local engineers, construction contractors, and foremen during a monthly contractor training session on 14 November 2009 at the Civil Military Operations Center in Khost, Afghanistan. Engineers from the Khost PRT provided construction quality-assurance training to locals to facilitate high-quality construction practices in the region. (Photo by Staff Sgt. Stephen J. Otero, U.S. Air Force)

among such, the bulk of the money that was intended to infuse the Afghan economy no doubt ended up infusing personal economies elsewhere.

For example, during one preconstruction meeting, the owner of one Afghan company arrived; he was a tall American with a common access card (CAC) that indicated he was a GS-15–level U.S. government employee. I had our base security investigate him and found that his CAC had been issued the previous year when he was working for the U.S. government.

During another job-site inspection, I met with a dubious owner of another company. Although Afghan, he had been a refugee who grew up in England, received a master's degree in engineering from Oxford Brookes University, and returned to Afghanistan to take over the family construction company. Former Afghan refugees owned a number of construction companies; although the majority had been refugees in Pakistan, several had returned to Afghanistan from Europe and North America, attracted by the potential of earning lucrative windfall profits from the U.S. Army construction program.

Among all such companies, even those owned by local Afghans, there appeared to be a pervasive degree of corruption at some level. For example, in one bidding process, we discovered that multiple construction companies were owned by a single individual and that these companies were submitting competing bids for projects during a process that attempted to hide their true ownership. Later, this set of companies was blacklisted when it was discovered that the owner had close ties to the Taliban.

However, it is worth noting that the corruption we found in the ownership of Afghan companies did not extend to Afghan labor. Afghan laborers were typically paid $5 per day. These personnel were working to provide the minimum necessities for their families, and $5 per day was adequate to feed a family.

Lesson 4—Afghan Lifestyle Meant Timelines Had to Be Flexible

Our mobilization training had prepared us for the term *inshallah* (God willing) and the fatalistic concept implied by it. The Afghans would often use this term to describe failure to meet work timelines, especially when they had little intent on meeting them. In response, we would typically be compelled to add 50 percent contingency time onto the end of project timelines to mitigate the Afghan inability to stick to an American-style construction schedule.

However, another unexpected issue arose from the final LOGCAP inspections of projects. Fluor would often reject the electrical or plumbing work, and would then ask for substantial amounts of money to fix it. Though paying Fluor to resolve the issues would have been much more expedient, we legally had to return to the Afghan companies as part of their original contract. We would then be forced to watch over the work to ensure that all corrections were properly made. It would typically take two to four months from the project-completion date before the construction was fully complete and the facility was ready for use.

Another large problem with keeping on project schedules was caused by Ramadan. The construction schedules submitted by companies routinely did not account for work slowdown during the Muslim holy month resulting from the religious obligation for workers to abstain from food and water throughout daylight hours extending from sunrise to nightfall. Though Ramadan was a significant societal event with practical impact on the lifestyle of most Afghans, management would not put projects on hold, and construction crews were still expected to work during Ramadan. A common result was that, due to fasting, crews would be so exhausted from the heat that, by midday, they would attempt to escape the sun, and the majority of physically demanding labor would come to a halt. As a result, the construction timelines would have to be pushed into the night after crews had broken their day's fast after sunset.

Lesson 5—The Bulk of the Construction Material Came from Russia

The civil engineering courses that I attended during BOLC taught reliance on American construction materials (e.g., lumber and I-beams). However, similarly graded materials up to American standards were often difficult for Afghan companies to secure domestically since Afghanistan did not have the natural resources or production infrastructure to manufacture them. Therefore, most of the construction materials were imported from Russia, and the cost of importing those materials drove up the price for projects. For example, standard pressure-treated Russian lumber was five times more expensive than U.S. lumber, and many sizes were not available.

Despite the seeming challenge of acquiring suitable substitutes for American-grade building materials, Afghan construction companies nevertheless still insisted that they could get any of the requested materials. For example, we had a project that required I-beams, and my original design called for American standard I-beams that were calculated from Field Manual 3-34.40, *General Engineering*.[4] We included a similar Russian I-beam that would be more readily available in Afghanistan, but the Afghan construction company insisted that they had American I-beams.

However, upon starting construction, we observed that the contractors were welding sheets of metal to replicate I-beams in form. These ad hoc I-beams clearly did not have the adequate structural properties required for the heavy construction contemplated. Notwithstanding, the owner of the Afghan company proceeded to vehemently argue that the welded sheets were, in fact, I-beams delivered from the United States.

A key lesson is the necessity to closely monitor the construction materials employed by Afghan companies since these companies often attempt to substitute substandard materials for those stipulated in the contract.

Lesson 6—Afghans Have Experience with Concrete but Typically of Dubious Quality

The Afghans have used concrete for construction for centuries so they have experience with it. However, their standards for mixing concrete were significantly less stringent than what we required and designed for, as our designs would call for 4,000-psi reinforced concrete. Unfortunately, it was our experience that we were often given falsified test reports that stated that the concrete was 4,000-psi when it

Mohammed Mohsin, a deputy provincial manager with the Central Asia Development Group, discusses a construction project with Lt. Col. Joseph Cetta, 3rd Stryker Brigade Combat Team and Combined Task Force Arrowhead, and Trisha Bury, a field program officer with the U.S. Agency for International Development (USAID), on 23 July 2012 outside the district center at Spin Boldak, Afghanistan. The project is part of an effort by USAID and the Afghan government to keep military-aged males and at-risk populations employed in programs that will improve the community. (Photo by Staff Sgt. Brendan Mackie, U.S. Army)

came time to pour, but would then fail the slump test that we gave it to verify the test report.[5]

The consequences of using poorly mixed concrete were everywhere. For example, as part of a humanitarian project, a well was built in one of the villages on the outskirts of Kabul. When I inspected the well, parts of the concrete broke off in my hand. Clearly visible in the mix were twigs and debris from the ground. Upon further analysis, it appeared that the contractor had used loose soil instead of sand in the concrete blend.

The issue of substandard concrete arose in large measure because Afghan construction companies typically preferred hand-mixing concrete. Hand-mixing involves dumping sand, rocks, cement, and water onto the ground and mixing it with shovels. The resulting concrete often failed to meet the basic standards for concrete. In one instance, we tested out a sample of hand-mixed concrete and it readily fractured at pressures well below that of 4,000-psi concrete, not even exceeding the standard for 1,000-psi concrete.

Lesson 7—Afghan Carpentry Had to Be Closely Monitored

The standard Army building on semipermanent bases is the barracks hut (B-hut), which is a twenty-by-forty-foot wooden structure. My base, Camp Phoenix, had roughly eighty B-huts. Army engineers built some of these B-huts, and Afghan construction companies built some as well. Those constructed by the Afghans were not outwardly distinguishable from those made by the Army engineers.

However, two issues arose from the use of wooden structures. First, the lumber was at a premium and

was typically imported from Russia. As such, the selection was limited and expensive. Second, though the outer surfaces of the wooden structures were painted in an attempt to help prevent deterioration from weather, the Afghan carpenters had used gasoline instead of turpentine or other more suitable additive to dilute the paint, and the gasoline had impregnated the wood. As a result, during the dry, windy season, the B-huts were prone to catching fire. Not surprisingly, our brigade commander did not allow his soldiers to stay in those B-huts due to the fire risk.

Lesson 8—Afghan Electrical Work Did Not Meet American Standards

The Afghans had few electricians trained to U.S. electrical standards. However, the Afghan companies would never admit they did not have adequately trained electricians because our SOWs required them. On the contrary, the technical proposals from construction companies would routinely indicate they had a licensed electrician that met the SOW requirement. However, from evaluating hundreds of technical proposals, we discovered that every company claimed the same three licensed electricians. As it turned out, these electricians were American expatriates who were presumably in very high demand. But, notwithstanding their assured presence in the proposals approved, over the course of the year, we never saw any of these electricians on any of our job sites.

Additionally, the quality of electrical supplies Afghan companies attempted to use was a major issue—many of the electrical components were fake. We found wires that had the wrong gauges and certifications stamped on them. Additionally, though our SOWs required that our electrical panels be "UL/CE approved," more often than not, Afghan companies would attempt to pass off counterfeit panel boxes merely by affixing "UL/CE approved" stickers to them.[6]

To mitigate these problems, we were able to provide significant oversight on the electrical work since our National Guard team included a signal noncommissioned officer who was a civilian master electrician. He would go through initial inspections, help the Afghans, and perform general quality control. Due to the ubiquitous attempts by Afghan companies at deceit and fraud associated with electrical work, over the course of the year, he was one of the busiest men in Kabul.

Lesson 9—Afghan Plumbing Work Did Not Meet American Standards

The Afghans' ability to do plumbing was on par with their ability to do electrical work. Similar to the poor quality of their electrical work, plumbing was characterized by leaks caused by mismatched fittings, bad welds, and poor seals. Additionally, Afghan contractors would use imported counterfeit parts from Russia when they thought they could get away with it.

One of our larger projects was construction of four two-story barracks with a latrine on each floor. Each floor could house a hundred and twenty soldiers. The projects were expected to be completed by mid-2009. However, the plumbing had to be reinstalled twice, both times due to a large number of leaks in the pipes. Not surprisingly, these were caused by mismatched fittings, bad welds, and poor seals.

We also had issues with latrine-shower-sink (LSS) units. These were eight-by-twenty-foot shipping containers converted into latrines with showers, toilets, and sinks. However, while the majority of Afghans were not familiar with Western plumbing, the issue with the units was more than that. Though our initial inclination was to blame the contractors, a real contributing problem was that our SOWs and drawings were incomplete. In the end, the issue was largely resolved by updating the documents.

Lesson 10—Safety Standards Are Fairly Lax on Afghan Job Sites

Our SOW mandated that the construction sites were Occupational Safety and Health Administration (OSHA) compliant. However, although we had no safety incidents for the entire year, the construction sites were far from compliant. The Afghans loathed personal protective equipment and never wore hearing or eye protection, even while welding or operating heavy equipment. They were expected to wear hard hats, and they would bring them to job sites, but they would never wear them. At one point, we saw them using their hard hats as mixing bowls for concrete. Additionally, the Afghan labor would walk up and down the ladders backwards, even on icy days, and they would stand on top of fifteen-foot Texas barriers as the cranes were moving them.

It is hard to know what lesson one derives from such a situation other than to try to be understanding and supportive within the cultural context one is confronted.

Conclusion

Although the number of U.S. forces in Afghanistan has decreased, Afghan companies will continue to perform the majority of new construction required on our bases. Awareness of the ten lessons discussed above gleaned from personal experience and observations are intended to help any soldier placed in charge of designing or overseeing Afghan construction prepare for the challenge. I suggest that the major overall lessons are that the Afghan companies hired to perform the work require close monitoring and significant oversight, and that we appreciate the necessity of operating with a reasonable expectation that there will be cost and schedule overruns.

Though the situation described above might seem at first depressing, it is important to note that the structures we constructed were eventually built to standard, and the construction missions were successfully accomplished. For a war that had been going on for fifteen years and cost $5 trillion, our schedule and cost overruns to complete them seemed trivial. ■

Biography

Vikram Mittal, PhD, is an assistant professor in systems engineering at the United States Military Academy, West Point, New York, and a company commander in the Massachusetts Army National Guard. He earned a BS from the California Institute of Technology, an MSc from Oxford University, and a PhD from the Massachusetts Institute of Technology. Mittal deployed to Afghanistan in 2011 as a brigade engineer in the 26th Maneuver Enhancement Brigade, where he oversaw construction operations in the Kabul Base Cluster.

Notes

1. U.S. Forces-Afghanistan (USFOR-A) Publication 1-06, *Money as a Weapon System-Afghanistan* (Afghanistan: USFOR-A, 13 February 2012), accessed 30 June 2016, https://www.jagcnet.army.mil/Sites%5C%5Ccontractandfiscallaw.nsf/0/9A566BF0D10C631B85257B0100650290/$File/MAAWS-A%20-%20Feb%2012.pdf.

2. Patrick Jors, *Construction of Military Facilities in Afghanistan: Is the United States Utilizing the Best Course of Action?* (Quantico, VA: Marine Corps University, 2 May 2011), 11, accessed 30 June 2016, http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA600744.

3. Rock Island Contracting Center, "LOGCAP Presentation," PowerPoint presentation, 15 June 2011, accessed 12 July 2016, http://www.acq.osd.mil/dpap/ccap/cc/corhb/Files/Surveillance/BCOT_LOGCAP_PCO_Presentation_20110802[1].ppt.

4. Field Manual 3-34.400, *General Engineering* (Washington, DC: U.S. Government Printing Office, 2008). This field manual was superseded as of 25 February 2015 by Army Techniques Publication 3-34.40, *General Engineering*.

5. A slump test is used to measure consistency (ease of flow), or workability, of concrete.

6. The "UL" listing mark means a product meets Underwriters Laboratories safety standards. The "CE" mark means a product has met health and safety standards of the European Union.