

CHAPTER 6

Supply Contracts

Although the Corps' large construction contracts attracted much attention, most of its contracts were small ones for goods or services. The first major supply contract that the Corps let in support of Operation DESERT SHIELD was for latrines followed closely by one for sunshades for helicopters. The searing desert sun made the equipment so hot that mechanics could not perform necessary maintenance and repairs. ARCENT needed sunshades to protect both the workers and the equipment. By mid-September, the Corps had awarded ten supply contracts totaling \$6.9 million to include field showers, burnout latrines, washstands, aircraft sunshades, and temporary buildings.¹ The Corps also awarded contracts to rent desperately needed engineer equipment. These supply contracts significantly improved the quality of life for many U.S. soldiers.

Latrines, Showers, and Washstands

One of the first tasks that MEAPO(SWA) received was to provide latrines and showers as quickly as possible for troops camped in the Saudi desert. In late August, the Dhahran Area Office staff contracted with John D. Knerr for 500 latrine units and with Rawan Contracting for 1,000 units.² Two Saudi firms, Al Khudair and I.A. Abahsain, became the major latrine, shower, and washstand producers. Companies like John D. Knerr, Al Suaiket, Shinsung Corp., and Nabil performed additional work. The Corps arranged for contractors to supply tens of thousands of latrines, showers, and washstands.

The standard designs for latrines and showers, dating from the Vietnam War era, had to be updated and modified to meet requirements in Saudi Arabia. Corps personnel were never able to locate designs from the U.S. military's more recent experience in Honduras or Grenada. Ceasar Santucci and a captain from the ARCENT SUPCOM sat down with the military's standard design books one evening and within hours had designed the first latrines, showers, and washstands. The Dhahran Area Office staff made some modifications to improve the designs.

Santucci began with an old field manual sketch of a tip barrel shower. He knew that with the very corrosive water in the Middle East, the welded fitting in the design would only last a month, so he looked for an alternative. He worried that some soldier would pull the release string and the barrel containing 300 pounds of water would crash down and kill him. Santucci and the other engineers decided to use 2x4-foot sheets of steel for reinforcement. To prevent corrosion in the water tanks atop the shower units, the Dhahran Area Office directed the contractors to repaint the interior of the shower tanks

already in production with water resistant paint and replace the tanks on the shower units already distributed.³

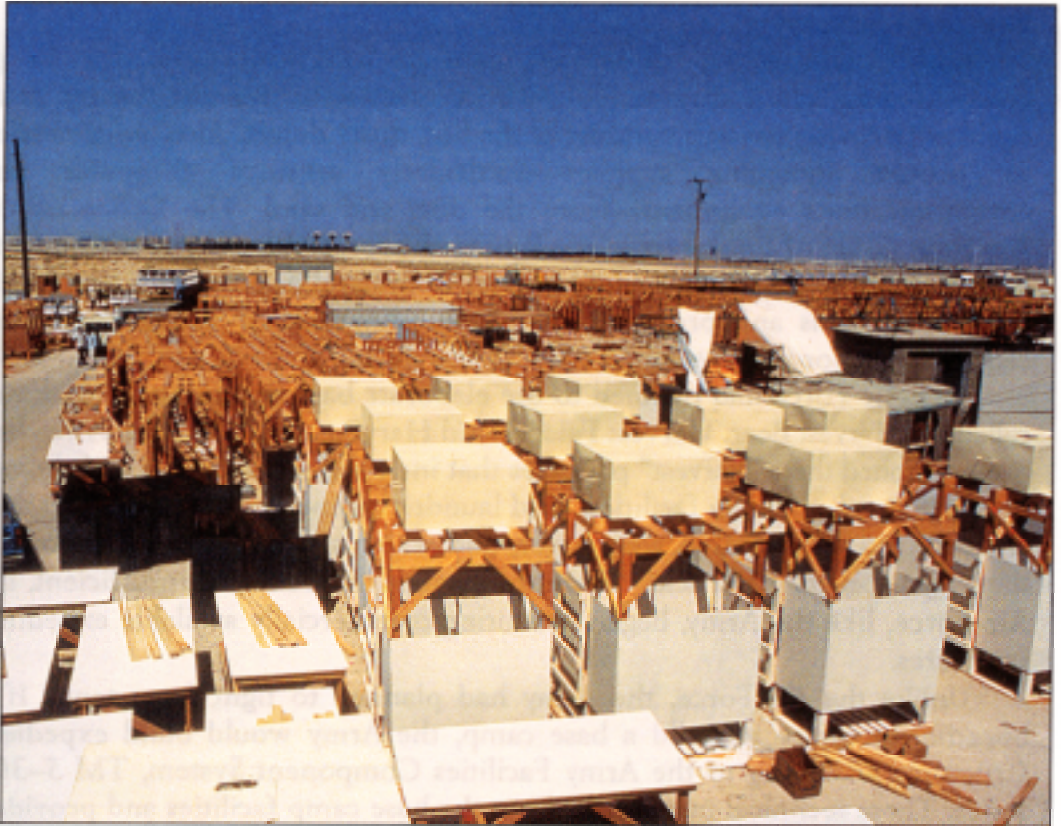
Engineers began with a three-hole wooden latrine with no partitions. Then they added two partitions. The final design was a three hole, three door, individual stall. With each contract award, they modified the design to make the units safer and more durable. For example, they developed more durable, spring hinges for the doors. They began using bolts instead of wood screws because the wood screws started coming off. As the ground war approached, the Dhahran Area Office even held a competition to determine the best design. In mid-February, the Dhahran Area Office issued purchase order contracts to seven contractors to construct portable latrines and showers.

Later that month, the Dhahran office staff held what they called a "build off" to acquire contractors' ideas for assembling collapsible units. The staff could only ship 8 to 12 assembled units on a tractor trailer, and trucks were scarce. Each contractor constructed one latrine unit, one shower unit, and one washstand in the parking lot outside the Dhahran Area Office. The "build off" was a success because the Corps acquired the designs it needed for rapid construction. Although the Dhahran Area Office took great care in designing the units, it never had enough inspectors to ensure that contractors followed the design specifications.

The first contractor for latrines, showers, and washstands did not know how to organize the work effectively. After the Dhahran Area Office personnel helped him move to a new location and establish an assembly line, he began producing units so quickly the office had difficulty modifying the contract fast enough to keep up with him. With so few U.S. troops in Saudi Arabia to counteract the threat of an Iraqi invasion those first weeks, contractors felt a sense of urgency. Later, as the U.S. force grew, the mood shifted to business as usual, and contractors lost some of their zeal. Yet, with some encouragement from the Dhahran Area Office staff, the contractors continued to meet the production goals.⁴

By early November latrine, shower, and washstand contractors had met the demand and were shutting down their operations. Then word came that the VII Corps would be arriving, and the Dhahran Area Office once again mobilized the contractors. With VII Corps' arrival and troop movement to the north, the requirements for these facilities increased dramatically. In early January, ARCENT determined that troops in the northern province of Saudi Arabia required 3,000 latrines, 2,000 showers, and 1,000 washstands. Previously, the supply had kept pace with the demand in the northern province, but stocks in the eastern province had been exhausted.

A Saudi contract with Khudair for latrines, showers, and washstands under host nation support had been pending since late November. In mid-January Colonel Miller asked the Saudis to direct Khudair to increase its production. Khudair could produce more, he explained, and going to other contractors



Contractors assemble latrine, shower, and washstand units for U.S. soldiers.

(U.S. Army photo by the 49th Public Affairs Detachment)

would delay delivery of the units. If the Saudis could not ensure prompt delivery of the units through their own contracts to meet the “critical” need, he warned, he would have to issue a contract using U.S. funds and procedures. Meanwhile, as the United Nations’ 15 January deadline approached, contract workers began to abandon their work sites. Khudair shipped more than 200 units a day to Saudi Arabia’s northern province, but as workers fled, maintaining those rates was difficult. Determining that the Saudis could not respond quickly enough, Corps staff awarded a U.S. contract to Khudair to supply 3,000 latrines, 2,000 showers, and 1,000 washstands.⁵

By 17 January, the Dhahran Area Office had delivered 10,500 latrine, 8,016 shower, and 5,600 washstand units. The units were not perfect. Troops occasionally complained about rusty water and problem doors, but they appreciated having the facilities. General Pagonis observed that the latrines and showers contributed to the low sick rate among U.S. forces.⁶

Santucci felt a strong sense of pride and accomplishment when, on the eve of the ground war, at the end of a meeting on the logistics scenario for forward deployment, he heard General Pagonis comment, “Well, that’s it then. We’re going to load up our showers and go.”⁷

Expedient Structures

Besides contracting for latrines, showers, and washstands, the Corps contracted for temporary buildings. As soldiers arrived in the theater, tents could not provide enough comfort in the hot, dusty desert. Also, units needed to protect incoming supplies—particularly sensitive computer and communications equipment—from the dust and sand. The Office of the Assistant Chief of Engineers in the Pentagon provided technical assistance to Forces Command and the Army Materiel Command in procuring relocatable building systems and provided overall coordination for validating theater requirements for such systems.⁸

The Air Force had planned to use elaborate base development packages called the Harvest Bear, Harvest Falcon, and Harvest Eagle. The Air Force had pre-positioned these “harvest” packages that included tents, latrine and shower units, kitchen and dining facilities, field laundries, general purpose and aircraft shelters, plus electrical power, sewer, and water systems. Troops assembled these light shelters in the field.⁹ When the current stock became insufficient, the Air Force, like the Army, began procuring commercially available expedient structures.

Unlike the Air Force, the Army had planned to fight from tents. If it became necessary to build a base camp, the Army would build expedient structures according to the Army Facilities Component System, TM 5-300 series. These technical manuals laid out the base camp facilities and provided detailed construction plans for individual structures. The Army had not placed the same emphasis on facilities as the Air Force. As a result, it did not have enough tents to meet its needs. Some soldiers slept in their vehicles. It deployed highly complex and costly equipment without providing adequate protection from the harsh climate. The need for facilities quickly became apparent. The Aviation Support Command, for example, hurriedly procured clamshell buildings—prefabricated, aluminum framed, tension structures shaped like clamshells—to support its aviation maintenance activities.¹⁰

One thorny question was how to pay for these structures. DOD Instruction No. 4165.56, dated 13 April 1988, and HQDA Letter 420-89-1, “Policy Guidance on the Use of Relocatable Buildings,” dated 18 December 1989, established the policy and procedures for relocatable buildings acquired for temporary use, to include their use, acquisition, transfer, accountability, and disposition. The 18 December policy letter required that the Assistant Secretary of the Army for Installations, Logistics, and Environment approve all relocatable building purchases for “temporary use as personal property.” It also stipulated that, when authorized, these buildings be procured using minor construction or military construction, Army (MCA) appropriations. The Army’s Engineering and Housing Support Center issued further guidance on 24 August 1990.



Clamshell buildings, manufactured in Santa Barbara, California, were used for aviation maintenance. Here, two AH-64 helicopters await maintenance outside a clamshell structure at KingFahd International Airport. Sand has eroded the blades from the Apache in the foreground costing \$180,000 in repairs.

Despite the guidance, military officials found that they needed further clarification of the policies and procedures for purchasing relocatable buildings to support the operations in the Middle East. Since MEAPO(SWA) procured the relocatable buildings to meet an overseas requirement and the need for the buildings would continue indefinitely, a MEAPO attorney concluded that the buildings should be classified as real property, rather than personal property, and should be paid for from military construction or operation and maintenance funds, not from the OPA (other procurement, Army) funds.¹¹

Arguing that the approval process was too lengthy and cumbersome, Pagonis asked Assistant Secretary Susan Livingstone to waive the approval requirement in the 18 December policy letter and give him authority to purchase relocatable buildings. He also asked her to seek authority for ARCENT to use operation and maintenance funds to purchase relocatable buildings until it had enough other procurement funds or military construction money available.

ARCENT needed many temporary, relocatable buildings to provide shelter, latrine and shower, maintenance, recreational, and medical facilities throughout the theater, he emphasized, but it was “almost impossible” to purchase relocatable buildings fast enough using the guidance stated in the policy letter. Leasing these units would be too expensive. ARCENT was competing with

other organizations to purchase these assets, and if the Army did not expedite the procurement process, it would lose the facilities to a competing buyer. Yet, Pagonis failed to note any instance where the existing procurement system had failed during the operation.

Livingstone found it impossible to waive the existing procedures. The Army general counsel had already determined that operation and maintenance funds could be used for military construction projects in support of Operation **DESERT SHIELD**, provided individual projects cost no more than \$200,000. All other construction was to be charged to military construction funds. Thus, relocatable buildings were included in funded costs in construction projects, and military construction funds had to be used for projects exceeding \$200,000. Livingstone determined that ARCENT had to fund all relocatable building procurement with these funds.¹²

U.S. forces used various expedient shelter systems for troop billeting and operations in the theater, including festival tents, clamshell buildings, sprung structures, and K-Span. Festival tents, purchased from Germany where they were used on holidays for temporary beer halls, were sometimes difficult to erect in the desert. The lightweight, compact clamshell buildings were assembled rapidly on site. They could be erected in four days by an untrained platoon. The sprung structures, in which a tension fabric skin covered a metal frame, required scaffolding and a crane to erect.

K-Span structures, made of thin sheets of galvanized steel, were cut to size and shaped on site by an automatic building machine. One machine formed



Side view of a clamshell building at King Fahd International Airport. The ends of the clamshell are opened and closed by either a band-cranked or a generator-driven winch.

enough steel for 15,000 square feet per day. One type of K-Span machine generated structures up to 72 feet wide at the base, while the "Super K-Span" generated structures up to 117 feet wide at the base. There was no limit to length. The average K-Span structures were 60 feet wide, 160 feet long, and 22 feet high. Typically, a crew of ten trained engineers could assemble a structure in three to five days. Soldiers from the 411th Engineer Brigade constructed 47 K-Span structures during the operation.¹³

At the time of the invasion, Forces Command had three K-Span machines in Jordan, where they had been used during a Joint Staff exercise. The command agreed to loan ARCENT these machines through 30 November 1990. In early October, four C-130 aircraft transported a K-Span machine and associated rolls of steel to Saudi Arabia. In addition, at CENTCOM's request, the Japanese government purchased ten K-Span machines with enough material to construct 80 insulated structures. The K-Span material began arriving in Saudi Arabia in early November. CENTCOM planned to use the initial shipments to construct helicopter maintenance facilities at Jubail and at Sheik Isa air base in Bahrain.

Although material for 70 more K-Span structures was expected to arrive from the United States in early January, the supply did not meet the project requirements. CENTCOM worked with the Saudi Arabian and Japanese governments to locate additional K-Span materials and obtain them through indefinite delivery contracts.¹⁴ Congress eventually gave the Army \$10 million in other procurement money for automatic building machines and "associated materials," but by that time, the Japanese government had procured all the machines that were needed.¹⁵

MEAPO(SWA) provided trailers as another form of expedient shelter. In September the Dhahran Area Office staff signed a contract with Al Khudair to supply several large trailers and signed a \$3 million contract with the Abdullah Fauhad Company to supply 360 mobile housing units. In October, ARCENT directed the Dhahran office to procure, transport, and install roughly 400 temporary buildings to establish a billeting compound for the support command staff at the Dhahran air base. In another instance, the Dhahran Area Office procured 50 temporary buildings for tactical units and others to use as needed.¹⁶

No one type of expedient structure met all requirements. Many systems were suitable depending on the requirements. Colonel Braden observed that clamshell buildings seemed best suited for the desert environment followed by sprung structures. Most troops preferred clamshell buildings because they were the easiest to erect. Assembly required no engineer skills or equipment and could be completed in one or two days. The K-Span structures were also easy to construct and versatile. Braden later recommended that this system be adopted as a joint service engineer building system. The problems encountered with K-Spans were sand in the equipment, heat buildup, and their immobility

once constructed. Ultimately, other nations provided 143 sprung structures, 220 K-Spans, and 20 K-Span automatic building machines.¹⁷

Equipment Rental

Engineer troops arrived in the theater with little or no equipment, particularly compaction, water distribution, and heavy transport equipment. Air transport space went to critical weapons systems and much needed supplies rather than heavy construction equipment. Army engineers and planners believed they could lease enough construction equipment in the theater. At the beginning of the operation, construction equipment was, in fact, widely available in Saudi Arabia because the country was in the midst of a construction slump. Operators, however, quickly discovered that the existing equipment was poorly maintained and unreliable.¹⁸

The shortage of engineer equipment significantly affected ARCENT's ability to support operational requirements. The 307th Engineer Battalion (Airborne) from Fort Bragg, which supported the 82d Airborne Division, and the 326th Engineer Battalion from Fort Campbell, which supported the 101st Airborne Division, brought little of their own equipment. Some soldiers from the 20th Engineer Brigade were in the theater for 20 days without equipment.¹⁹ In late December, the 307th's commander, Lieutenant Colonel Carl A. Strock, reported, "This lack of equipment would haunt us and hinder our effectiveness for the first two months of the operation and to some extent continues to do so."²⁰

Meanwhile, the Army found that the equipment it had brought was quickly damaged by the desert environment. Sand filtered into the most minute areas of any piece of equipment. To minimize this, soldiers replaced filters and wiper blades more often than usual and wiped lubricants from outer surfaces to keep sand from sticking there.²¹

With military construction equipment at a premium, officials launched a "massive effort" to lease and purchase dump trucks, dozers, graders, bucket loaders, water distributors, back hoes, and other equipment for engineer units whose own equipment had not yet arrived in the theater. The Army leased local contractor equipment, and used heavy transportation equipment from the Japanese, Germans, Italians, and Czechs. The Dhahran Area Office staff leased construction equipment from the Bosmain Commercial Establishment for the 20th Engineer Brigade and the 608th Ordnance Company on 30 September. The 608th received equipment on 7 October, but the contractor had difficulty providing equipment and maintenance for the 20th Engineer Brigade. The South Atlantic Division reported in October, "Obtaining timely and reliable contractor provided maintenance continues as a problem."²²

Faced with a shortage of engineer assets at echelons above corps, work requirements that were predominantly horizontal, and a shortage of organic compaction equipment and water and asphalt distribution equipment, the 411th

Engineer Brigade began leasing commercial construction equipment and using Japanese funds to purchase that equipment. With both corps requesting equipment, well-maintained host nation equipment became even scarcer. In a three-week period, the brigade requested and inspected roughly \$10 million in engineer equipment. Although personnel inspected the equipment before accepting it from the contractor and procurement packages provided for maintenance, the quality of the commercial equipment, particularly the leased equipment, was often poor.²³

The 411th Engineer Brigade faced a continual shortage of compaction and water distribution equipment and primary haul assets. Although the brigade purchased and leased compaction and water distribution equipment in the theater, it never had enough to meet all requirements. For example, it never had enough capability to produce and spread hot mix asphalt at King Khalid Military City or enough organic haul capability to respond to shifting priorities in the theater. "It wasn't that you didn't have it [the equipment]," General Storat explained. "It was the difficulty in getting the right equipment at the right place and the right time to do the job."

The brigade had to spend much time servicing the equipment it acquired to keep it running. Equipment owners did not supply instruction manuals, and the equipment operators they provided were inadequately trained. Some equipment worked well; some did not. Some contractors were excellent, and they successfully got water and compaction equipment out to the job sites to keep projects going. But there were also many problems associated with rental equipment. Leasing, Storat concluded, was "not an effective long term remedy for having the right mix of equipment in the combat heavy battalions."²⁴

The most severe shortage was in heavy transport equipment. Long haul trucks, flatbeds, and dump trucks became critical because they were low on the Army's priority list for transport into the theater. Before the force deployed, logistics planners assumed there would be enough trucks in the theater, without bringing in Army and Marine construction support (truck) companies. They planned to contract with the host nation for trucks, but good trucks were scarce on the Arabian peninsula.

Prices escalated sharply as various services competed with one another to lease trucks, particularly in November and December as the U.S. military moved tanks and other equipment to the front lines. When the Saudis began negotiating contracts for trucks as part of host nation support, they competed with U.S. units and drove prices up even higher. Initially, the Dhahran Area Office could rent a truck for 400 riyals a day, but at one point the price rose to 1,500 riyals a day, and at times no trucks could be found at any price.²⁵

Current modified tables of organization and equipment authorizations for combat heavy engineer battalions and combat support equipment companies provided only a third of the haul assets that the engineers needed to move their equipment over long distances. VII Corps, for example, had difficulty

transporting its only heavy battalion—the 249th Engineer Battalion (Combat Heavy) out of Knielingen, Germany—from the port to the northern and western regions where the corps was located.²⁶

During the Gulf operations, Task Force 43 made two moves, each covering nearly 350 miles. The lack of trucks forced the task force to rely extensively on nonorganic sources, but changing priorities and availability of transportation vehicles made these sources unreliable. Nearly six weeks passed before the task force had all its organic equipment in place. Meanwhile, it had missions vital to the mobility of the entire VII Corps.

Task Force 43 used equipment purchased with Japanese government funds. Much of this equipment needed repair. The equipment's 90-day maintenance warranty did not include repair parts. The task force had to obtain its own repair parts, and since the rental equipment rarely matched the equipment in the Army inventory, repair parts were not readily available. The only source of repair parts was in Riyadh, an hour's drive from the task force's base camp. The equipment came without manuals, making maintenance even more difficult. Terminating a useless contract could take months. The task force simply parked broken equipment in the motor pool until it had to be turned in. When equipment arrived with operators who provided maintenance, the equipment was more productive. When the contractor provided no operator, the equipment often arrived in "a very deplorable state of maintenance" and had to have major repairs before it could be operated. Purchasing large quantities of used construction equipment did not help the task force much and created a maintenance nightmare.²⁷

After the Persian Gulf War, Lieutenant Colonel Van Sickle warned that engineers should not expect to enter a foreign country and rent new equipment. Understandably contractors were reluctant to rent their newest and best equipment when they knew the renter would pay as much for the old equipment. Moreover, contractors knew that renters would not care for the rental equipment as well as they would care for their own. If a contractor rented his best equipment, he would have to charge an extremely high fee to make a profit, so he loaned out equipment that he could throw away if the renter broke it.

Shipping equipment from the United States was very expensive for the contractors, and getting replacement parts could take up to four months. Replacing a dozer, for example, could cost \$30,000 to \$50,000. Also, equipment owners worried that U.S. troops might take the rental equipment into Kuwait and Iraq. Their concerns were justified. Although the Dhahran Area Office contracts required that the rental equipment remain in Saudi Arabia, troops drove the equipment into Kuwait and Iraq during Operation DESERT STORM and abandoned it there after the war.²⁸

Observations

The contracts for latrines, showers, and washstands plus sunshades, expedient structures, and rental equipment filled a critical need in the first months. These contracts helped U.S. forces execute their missions more effectively.

The U.S. Army Corps of Engineers and its contractors provided 10,000 washstand, 16,000 field shower, and 23,000 latrine units. By 1 March, the Corps had spent more than \$29 million on latrine, shower, and washstand contracts, more than \$6 million on equipment rental, and more than \$5 million on expedient structures.²⁹ With the implementation of host nation support, the Saudi Arabian government assumed some responsibility for these supply contracts.

Yet, even with increased support from the host nation and later the Japanese government, the need for the Corps' basic supply contracts continued throughout the offensive and redeployment phases. Supply contracts proved to be a reasonably responsive and cost-effective method of meeting the immediate needs of troops, but as noted, the reliance on contractors also posed problems.