

Center for Army Lessons Learned (CALL)
“News From the Front”



**RAPID EQUIPPING FORCE:
EXPEDITIONARY CAMP - ERBIL**

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INTRODUCTION AND BACKGROUND

When it comes to providing comfortable living spaces for deployed Soldiers while saving time, money, fuel, and water, rigid walls beat canvas every time. Rigid-wall camps represent a step up from the Temper Tent (air supported) Force Provider base camps currently installed at LSA Danger in Erbil, Iraq.

The rigid-wall shelters have an insulation R-value of approximately R12; this is in comparison to R4 for tents. They feature light-emitting diode (LED) lighting, motion-detecting switches, low-water efficient laundry systems, low-water latrines and shower heads, waterless urinals, rain water collection systems, shower water reuse systems, highly efficient generator micro grids, and solar shading with photovoltaics and battery power storage. The amount of heating and cooling needed is minimal for these structures.

Not only are energy and resource reductions of 35 to 75 percent possible, but resources needed to deliver fuel and water to base camps are reduced, resulting in contracted services savings. Once they are up and running, the camps require little maintenance. Each rigid-wall shelter can house 10 Soldiers and be set up in less than 15 minutes by four people. Much less site preparation is needed for rigid-wall shelters than tents, which require wooden platforms.

Phase I: Defining the Requirements

During the requirements development process it was determined that the Rapid Equipping Force (REF) could react immediately to fulfill the billeting requirements in Erbil. The REF's mission is to harness current and emerging technologies to provide immediate solutions to the urgent challenges of U.S. Army forces deployed globally. Its goal is to be the Army's quick response capability for urgent non-standard equipment.

The REF had two existing rigid-wall expeditionary camps in the U.S. that had been in use for a number of years as part of a pilot program to compare rigid-wall camps. These rigid-wall test camps were at Fort Benning, GA, and Fort Bliss, TX. The pilot program consisted of two versions: the Energy Efficient Shelter System (E2S2), manufactured by Berg Company, and the Vantem Modular, manufactured by SpaceMax. The REF used both types of rigid-wall shelters in constructing the Erbil camp.

Phase II: Site Preparation

Prior to installation of the expeditionary camp (ExCamp) shelters, the land at the site of the camp was cleared and graded and a base provided. The ideal base consists of concrete pads, and would be required if the plan included stacking the units one upon another. However, in Erbil the U.S. is prohibited from erecting permanent structures (including pouring concrete pads), so gravel was used as the material for the shelter base. While a compacted gravel surface was the optimal surface needed for the shelter base, the unit teams were



unable to make this happen. This led to some challenges during installation and maintenance, which are discussed in detail below.

It would be best to have either the field service representative (FSR) or an engineer plan the camp layout and design, paying particular attention to service ingress/egress routes. In this case, the FSR was not on site when the camp was delivered; therefore, the units were not positioned in their final layout positions. The unit had trouble placing the shelters in the non-compacted gravel, ultimately requiring the use of a forklift with oversized tires to navigate the thick gravel with the heavy loads. Rigid-wall shelters must remain level.



Teams were needed to monitor shelters and adjust levels on a regular basis, especially after every rainfall.

Phase III: Installation

The Erbil mayor's cell was tasked with installing the ExCamp. The FSR was on the ground for two weeks to provide instruction on how to assemble the shelters. Although it was planned to have the FSR on the ground throughout the installation, the FSR team's time-on-station was limited. Therefore, it was decided to have the FSR train the personnel from the mayor's cell on how to install the units.

The FSR worked with the generator technicians, teaching them how to install the power plant. The power plants have a Load Demand Stop Start (LDSS) system. (The LDSS keeps one generator running at all times. The rest are connected parallel to one another. Once the first generator starts to pull around 25 kilowatts, it will kick on another generator and share the load. The optimal load per generator is 12-25 kilowatts.) There are six generators in total. The installation of the power plant was straightforward and completed without any problems. The personnel installing the shelters learned that it is important to get the power plant up and running first; doing so allows you to connect power to components during set up to ensure they are working properly.



Installation of most components was uncomplicated, but took a lot of muscle power. Just three people set up the first component, but the team had to use a pickup truck to pull out each wall extension due to its weight. Based on the experience of the Erbil mayor's cell personnel, both manufacturers' shelters worked fine; however, the one brand of shelters was a bit smaller and a bit more complicated to set up. This was in comparison to the other brand which was much easier to deploy and required less training to install.

A second problem was encountered when it was discovered that some of the shelters were not clearly labeled as to which component they were (laundry, showers, quarters, etc.). This made correct placement of the shelter uncertain. It was not until these shelters were expanded and the personnel were able to look inside that they learned which component they had. This resulted in having to move components around to reconfigure the layout.

Installation of the laundry, latrine, shower and dining facility (DFAC) components proved to be more complex than quarters and tactical operations center (TOC) components. The mayor's cell struggled with the setup of the latrines and all the associated tubing that connects the water, waste grinder, and heating pumps. Making all the connections work required a skilled plumber, which the mayor's cell did not have.



The latrine shelters were used and refurbished sets, missing components needed for installation. Because of this, some issues with used equipment, broken seals on toilets, water lines not sealing, running toilets, etc. were expected. Some of the water pumps provided did not work. The unit had to improvise a great deal during the installation until the REF could send additional components and replacement parts.

The REF has continued to provide guidance and advice, limited by the FSR's inability to work issues face to face (FSRs were not on site). It would be best for the FSRs to stay through installation of the DFACs, latrines, laundry, and power plants.

Supporting Activities

A consideration when building a new camp is providing the services required to sustain the activity. If you are building a DFAC, you are going to need a service contract for food service personnel and supplies. If you are putting in laundry and latrines, you are going to need contracts for personnel to clean and for wastewater removal. These contracts can take some time to put in place. It may be difficult to establish these requirements until the camp is constructed and metrics employed to determine the specific requirements based on how the camp functions, (for example, the size and connections for wastewater removal). Vendors will probably want to see the camp layout before they are willing to quote on potential contracts. In planning for the ExCamp, some type of interim/alternative means to fill this initial services gap should be considered.

Best Practices and Lessons

1. **Rigid-wall shelters are preferable to tents:** The setup of the rigid-wall camp can be accomplished in a few man hours and with far fewer people than the Force Provider tents, as long as you have forklifts to move the containers.

- It takes 4-6 personnel to set up the tents. It takes less than an hour to set up the tent, but it takes 2-3 hours to set up all the equipment in the tent. There is a great deal of labor and materials involved in building a floor for tents, which you want to do if you are going to be using them for an extended period of time. When using the camps for long periods, you also have to replace and maintain the floors.
 - Rigid-wall camps are designed to be temporary or permanent. Rigid-wall units can be up as long as needed, versus the Force Provider tents which have a life expectancy of 18 months.
 - Ongoing maintenance for the tents entails repair and replacement of the floor, patching tears, and maintaining the air pressure of the frames. You also have to contend with mold in the tents, which is difficult due to overlapping and creases in tentage.
2. **Shipping:** Consolidate all units and components and ship them together. The goal is that the entire camp arrives at the same time, which will aid in coordinating the installment.
 3. **Compact Gravel:** When using gravel, compact it if possible, or ensure you have a forklift with oversized tires to navigate loose gravel with the heavy components.
 4. **Layout Design:** Ensure you have a trained technician available to design the layout of the camp.
 5. **Properly Mark Each Component:** Ensure each component has markings on the outside to identify the component type (latrine, laundry, TOC, etc.).
 6. **Align Resources:** Coordinate to have labor available while the FSR is on site. At a minimum, ensure the FSR supervises the installation of the power plant and shelters that require plumbing.
 7. **Bring Extra Parts With Tool Sets:** Along with the shelters, REF sent a Hilti jack hammer for use during installation. Unfortunately, the jack head broke and there was no replacement head available. Soldiers had to pound in the remaining ground rods by hand. In the future, REF must provide replacement jack heads with the jack hammer.
 8. **Coordinate Services:** Plan for the service contracts that will be needed prior to inhabiting the camp.

Conclusion

The expeditionary shelters proved to be a viable means to construct living and work spaces quickly. The teams were able to erect all the shelters in the ExCamp in less than four hours. Rigid wall structures are an improvement over tents and offer a quick, quality solution when permanent construction is not an option.