

Case Study - **General Leonard Wood Army Hospital**

DELIVERING ACCURATE COST ESTIMATES THROUGH RISK INFORMED DECISION MAKING

As greater emphasis is placed on improving accuracy of MILCON estimates, partnering and shared commitment of the Project Delivery Team becomes even more vital. Project Stakeholders on the new General Leonard Wood Army Community Hospital had to overcome the traditional challenges of designing, estimating, and awarding a complex design-build healthcare project for the residents of Missouri.



Photo: Missouri.net.com

A WORLD-CLASS HEALTHCARE FACILITY SERVING 34,000 BENEFICIARIES

Fort Leonard Wood is home to the 102nd Training Division (Maneuver Support) and trains more than 80,000 military and civilians each year. General Leonard Wood Army Community Hospital is currently housed in a facility that is over 40 years old and is located on a constrained site. This project includes a 235,376 sqft hospital, 193,332 sqft medical clinic, a 20,459 sqft central utility plant, a five-bay ambulance garage, and supporting facilities.

Over the past three (3) years the Government Accountability Office (GAO) and Society of American Military Engineers (SAME) have used research and Industry-Government collaboration meetings to identify and recommend solutions to cost estimating challenges to ensure the Government receives comprehensive, well documented, accurate, and credible estimates for effective resource allocation.

Improving the accuracy of DoD cost estimates requires teams to use best practices, to understand and use cost and schedule risks, and requires a commitment by all stakeholders to communicate and share vital information to deliver an awardable project. Project stakeholders need to be intentional about doing things differently as early as possible, share and utilize lessons learned, focus on project risks, engage industry, and collectively own the cost estimate throughout the life of the project.

The Defense Health Agency, Health Facility Planning Agency, U.S. Army Medical Command, USACE Kansas City District, USACE Walla Walla District, LEO A DALY, and Crawford Consulting Services (the Project Delivery Team) embraced collaboration and Risk Informed Decisioning Making from the on set of the project and committed to risk and cost management at every milestone.

USACE Program Manager, Kelly Miller was instrumental in holding the team accountable throughout the entire D-B RFP development stating, *"The entire team understands the importance of delivering this project on schedule and within our Project Authorization. The Department of Defense*

Idea in Brief

THE CHALLENGE

Projects must be designed and estimated in an extraordinarily short time with a notable amount of uncertainty. Crawford's goal was to provide a comprehensive and accurate cost estimate to the project stakeholders resulting in an awardable project.

THE SOLUTIONS

Project Delivery Teams need to be intentional about doing things differently, starting with sharing and utilizing lessons learned during DD1391 programming. During design, the team's risk driven project management process ensured proactive risk monitoring at every phase and created a shared view of the situation between all stakeholders. Collaboration drives success. USACE organized multiple industry engagements and incorporated suggestions in the acquisition strategy.

THE RESULTS

A comprehensive, well documented, accurate, and credible cost estimate that resulted in an awardable project as well as early alignment between all stakeholders which enabled the project to bypass the design charrette and move right into technical review of the proposal, saving critical time and effort.

PROJECT INFORMATION

CLIENT

Defense Health Agency, Health Facility Planning Agency

PROJECT DELIVERY TEAM

USACE Kansas City District, USACE Walla Walla District, LEO A DALY, Crawford Consulting Services

LOCATION

Fort Leonard Wood, MO

CONSTRUCTION COST

\$295 million

COMPLETION DATE

2024



Photo: JE Dunn

Medical facilities enterprise and USACE have struggled to attain these objectives for recently delivered medical facilities. As we dug into lessons learned on other projects, it became obvious that we needed to rethink our acquisition strategy. We ultimately elected to utilize performance oriented, two phase, cost technical trade-off design build to deliver the project. The intent was to allow offerors maximum flexibility to meet our schedule, budget and quality expectations.”

Kelly noted, “Our team engaged with industry partners before and during acquisition and incorporated their feedback. This resulted in significant changes in our acquisition strategy and technical requirements. We utilized risk informed decision-making to refine our acquisition strategy and craft the RFP technical requirements. Risk informed decision-making has continued into design after award and construction as a part of our Joint Risk Matrix Management process. The final proposal submitted by JE Dunn Construction Co. and RLF Architecture-Engineering-Interiors was in such alignment with our team’s technical expectations it allowed us to skip the planned design charrette and instead move on to conducting a technical review of the proposal. It is also worth noting that our contract was not only awarded within the Project Authorization, it included all seven identified betterments. These included a tornado resistant area of refuge and structural and exterior FEMA enhancements for the hospital that are intended to make our new facilities a safe haven during extreme weather this region often experiences. All in all, the team is very proud of what we’ve achieved thus far.”

CHALLENGES

Projects frequently must be designed and estimated in an extraordinarily short time with a notable amount of uncertainty in today’s rapidly changing environment. Large federal hospital projects are

challenging and have a history of being delivered late and over-budget.

Establishing a cost and schedule risk model and resulting contingencies becomes critical to produce quality Total Project Cost (TPC). The CSRA is just a portion of the risk management strategy so it is important to begin this process early in project development so that the risks determined over time can be managed, planned for, and mitigated as much as practical to remain within the appropriated budget.

Lastly, Firm-Fixed-Price contracts place upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. Poorly designed RFPs and minimal industry day engagements limit the Government’s ability to solicit feedback about a procurement to reduce contractor risk that can increase construction award dollars.

Brent McElrath’s (Crawford project manager) goal was to provide a comprehensive and accurate cost estimate to LEO A DALY and USACE Kansas City District on this complex DB RFP project so that the beneficiaries around Fort Leonard Wood could have access to a world-class healthcare facility.

SOLUTIONS

To address these challenges, the PDT was very intentional about doing things differently, starting with sharing and utilizing lessons learned from recent similar Government Hospital projects during Crawford’s DD1391 programming effort that were used to develop our parametric cost model with better data. Fact finding sessions between all stakeholders enabled our team to minimize wasted time and effort exploring ideas and options that were unsuccessful on previous projects, creating a path for success as this funding request went to Congress. Crawford provided both the DD1391 programming and DB RFP estimate

which kept intrinsic cost knowledge of the project with the same estimating team.

Additionally, the team's risk driven project management process ensured proactive risk monitoring at every phase and created a shared view of the situation between all stakeholders. Risks will change during the course of the project, so stakeholders need to reassess risks at each stage of the project. Kelly Miller was dedicated and committed to involving all PDT members to share risk concerns and communicate as a team to define and target high risk areas for management and mitigation.

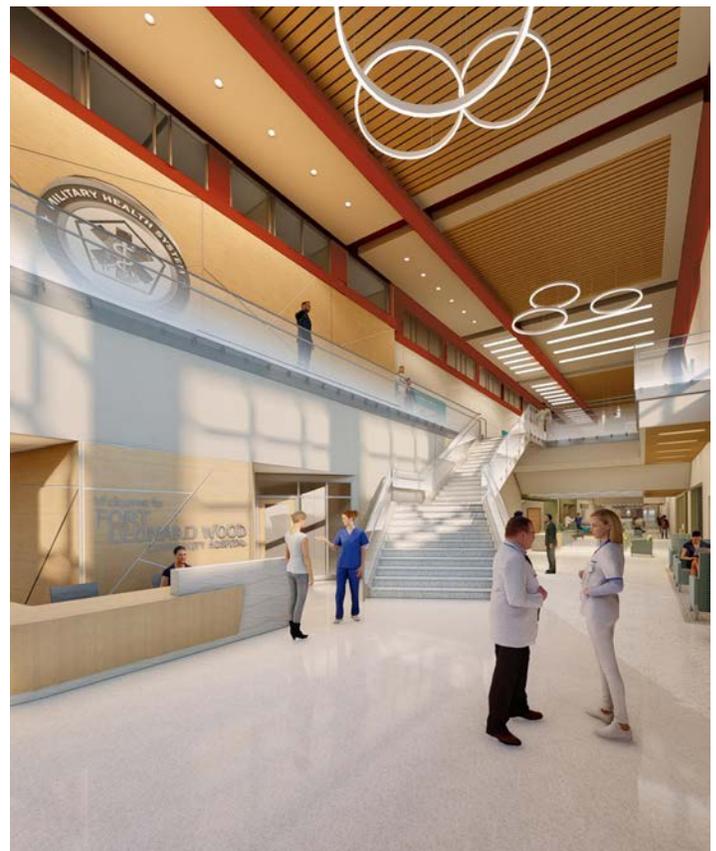
The Cost and Schedule Risk Analysis was led by Patrick Miramontez, Kansas City Cost Engineering Branch (CENWK) and Michael Jacobs, Chief, USACE Cost Engineering MCX (CENWW). The purpose of the CSRA was to develop an accurate contingency amount to improve accuracy of the total project cost, to provide a range of possible costs for management and customers to use to make decisions, and to utilize as a tool to manage project risks. The CSRA process developed a risk register during a formal two-day project risk identification and assessment meeting, where more than 90 risks were identified with 19 that were considered significant. Brent McElrath provided accurate cost and schedule data to support risk impacts and to identify targets for action and mitigation. A Monte Carlo simulation was run on the 19 significant risks to determine the contingency amount to use for comparison of the CWE to the programmed amount.

The CSRA process relied on the project team to consider these risks while developing the project requirements. Tasks performed included breaking the risk down to a point where it was actionable, developing risk countermeasures, primarily RFP technical requirements, and monitoring and reporting the results of the countermeasures.

For this project, Project Leadership Teams, or PLTs, were deployed to handle these tasks. The PLTs were made up of subject matter experts from the customer, key stakeholders, Corps design and construction staff (including the EDX), and LEO A DALY to break the risks down, develop proposed countermeasures or solutions, and then transfer the solutions to an Outstanding Items Report where they were monitored weekly by the PDT until the risk was mitigated. Brent worked in concert with CENWK to constantly update the risk register to keep the PLTs and stakeholders informed on project status.

PROJECT LEADERSHIP TEAM PROCESS EXPLAINED:

- Conducted preliminary Cost Schedule Risk Analysis (CSRA).
- Identified significant risks warranting further assessment and deployment of countermeasures (rated High or Moderate risk in CSRA).
- Project Leadership Teams (PLT) formed to assess individual risks, develop countermeasures, and monitor implementation.
- Identified countermeasures added to Outstanding Items List to ensure PDT visibility.
- Monitored and recorded activities until risk was eliminated. (Number of PLTs in assessment and countermeasure identification phases were limited to six (6) due to manpower constraints).
- As PLTs completed assessment and countermeasures phases, they moved to monitoring phase, and a new PLT was formed to address another project risk.
- Crawford provided cost and schedule impact (dollars) to the model to assist in justification of inflated contingency costs and updates to the independent estimate.



As PLTs completed the assessment and countermeasures tasks, they moved into the monitoring phase. As this occurred, the PLT went on to the next significant risk factor. As they moved on to the monitoring and reporting phase, new PLTs were stood up to address new risks. This process continued until all significant risks were being monitored and mitigated within acceptable tolerance levels.

Furthermore, USACE organized multiple industry engagements and incorporated many industry partner suggestions in the acquisition strategy. This solicitation was posted as a Full and Open (Unrestricted), Two Phase Design Build acquisition enabling early contractor involvement to achieve a more collaborative relationship between DHA/USACE, LEO A DALY, and the short-listed contractors to make collective decisions regarding risk early on by all parties. This enabled Crawford to quantify cost and schedule risks that were reflected in the Independent Government Estimate.

RESULTS

Crawford's access to lessons learned and a collaborative group of stakeholders during DD 1391 programming provided a comprehensive, well documented, accurate, and credible budget to start. Performing a CSRA to assist with contingency development and managing risks was a critical tool in the cost engineering and risk management effort. Staying engaged during development of the DB RFP estimate with the same PDT, coupled with CENWK maintaining a high level of commitment to creating conditions focused on Risk Informed Decision Making resulted in an accurate estimate and successful project.

Early contractor involvement mitigated risk and allowed these three (3) construction firms to submit RFIs and make collective decisions regarding risk prior to the final RFP, increasing the likelihood of project success. In fact, the DB team indicated that this was one of the most detailed and thorough RFPs they've ever encountered.

The \$295 million hospital complex will be completed in 2024 and will rival those found in the civilian sector while paying homage to the rich history of Fort Leonard Wood.

LESSONS LEARNED AND NEW INITIATIVES

- Significant investment in analysis of lessons learned from previous hospital projects
- Heavy industry engagement pre-award
- Performance oriented design-build
- Phase One down select to three offerors
- Phase Two included issuance of draft RFP, interim interviews, and oral presentations
- Stipend provided to qualified, non-selected offerors
- Inclusion of complex medical equipment/systems as contract options
- Early involvement of Initial Outfitting team
- Risk-Informed Decision Making, including Cost Schedule Risk Analysis
- Joint Risk Management pilot
- 4D Building Information Modeling (BIM)
- Virtual Reality utilized as a cost effective means to augment physical mock-ups for key spaces
- Collaborative Analytics used to monitor relational aspects of project delivery
- RFP Preparer, Leo A Daly, providing post construction award and commissioning services



by Shay Kelly, CCP and Brent McElrath, CCP

Crawford Consulting Services, Inc. (Crawford), a Woman Owned Small Business (WOSB), provides cost estimating, scheduling, value engineering and construction management services to assist in the delivery of mission critical projects around the world. Our certified professional staff understands the specific challenges related to Federal construction and collaborates with our AEC and Government partners to minimize project risks resulting in on-cost, on-schedule, and quality-built projects.

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