Pro2Serve®
Professional Project Services, Inc.

Case Study

SNLA Process and Environmental Technologies Laboratory (PETL)

The Process and Environmental Technology Laboratory (PETL) is a state-of-the-art laboratory building designed by Pro2Serve and constructed on Sandia National Laboratories' Albuquerque, New Mexico, campus. PETL was a major federal budget line item project for the Department of Energy. The three-story building is designed to house approximately 180 people, and it contains laboratories for aging and reliability studies, development of scientifically tailored materials, process exploration, materials characterization, and modeling.

The construction budget for PETL was fixed based on the line item request and congressional approval prior to commencing the Title I & II design effort. The primary goal of the design effort was to provide maximum research floor space and incorporate desired features while maintaining the established project budget. This goal required that the cost estimators become an integral part of the project team from start to finish.

A project cost model was developed based on known schematic design parameters and working meetings with each member of the design team. This information was input into the model according to the related CSI (Construction Specifications Institute) division, which was the client selected format for this project.

The model provided preliminary material and labor quantities extended against known actual costs or accepted parameters. The completed cost model provided a projected construction cost segregated by design discipline. The model was then reconciled against the established budget, This reconciliation was performed by the estimators and the designers. Various design options were proposed and estimated until a workable and cost effective solution was found. A final “buy-in” was obtained for the cost model from the entire project team including the owner and end users. The project was then ready to move forward into the detailed design phase, with the cost model providing a budget road map.

A unique aspect of the PETL project design was the incorporation of heavy cast-in-place concrete waffle slab, column and beam construction to support materials research at the submicron level. This system was selected to alleviate building vibrations which was of utmost importance the researchers who would be the end users. An accurate estimate for this type of construction, applicable to the project’s geographic region was essential to maintaining the budget. The estimators solicited input and price quotes from contractors specializing in this type of construction and familiar with the work area.

Several variables such as custom formwork, temporary supports and shoring had to be considered. This required interface with numerous contractors, suppliers and consultants. The cost data collected was assembled into a matrix which was reviewed and discussed in depth with the project team. A final estimate of the probable cost for the structural system was derived from the matrix. Pro2Serve’s construction cost estimate was accurate within 2.8%. This exercise is but one example of the efforts put forth to assure that the PETL project design provided a state of the art research facility, constructed and commissioned within federal budget limits.

The PETL design features flexible labs that can be isolated by fire-rated walls and doors to accommodate future additions and/or relocation of existing hazardous laboratories. The laboratory’s layout encourages occupants to communicate and share ideas with each other by providing six breakouts in the corridors on each floor.

The sustainable design of PETL includes solar siting concepts, daylighting, solar shading for the exterior glazing, water harvesting, indigenous plant materials, an energy recovery system, and a building

management system. This innovative design approach reduced projected energy costs by 40% compared to the conceptual baseline.

After completion, PETL was selected by the US Environmental Protection Agency and the Federal Energy Management Program of the US Department of Energy for use as an exemplary case study for Laboratories for the 21st Century.