



## VALUE ENGINEERING PROGRAM

VE can be applied at any point in a project, even in construction. However, typically the earlier it is applied the higher the return on the time and effort invested. The main stages of a project and VE's application are described below.

### PLANNING

At the Planning stage of development, there are additional benefits to be derived from Value Engineering. Our team can:

- Review the program
- Perform a functional analysis of the facility or system
- Obtain the owner/users definition of value
- Define the key criteria and objectives for the project
- Verify/validate the proposed program
- Review master plan utility options (e.g. Central Utility Plant versus individual systems)
- Offer alternative solutions (square footage needs per function, adjacency solutions, etc.)
- Verify if the budget is adequate for the developed program

The benefits are significant:

- Any changes to the program at this stage have very little if any impact on schedule and A/E time and redesign costs.
- The project will be developed with fewer changes, redesigns, and a greater understanding by all parties of what the final function and space allocations will be.
- An independent team can bring a fresh outside view of alternate solutions from other similar projects.

## DESIGN

This is the stage that most VE participants are used to becoming involved, when the design has at least made it to the schematic stage. Most owners institute at least one VE session at the design stage on projects over a certain \$ size.

VE is an opportunity to bring the design team and client together to review the proposed design solutions, the cost estimate, and proposed implementation schedule and approach, with a view to implementing the best value for the money. The definition of what is good value on any particular project will change from client to client and project to project.

Later, we may also use VE during the construction phase, often in partnership with a general contractor or multiple sub-contractors, in a shared savings program. Regardless, we are constantly focused on analyzing the functions of the design and construction process to determine best value, or the best relationship between worth and cost. In other words, best value is represented by an item or process that consistently performs at the required level of service and has the lowest total cost or the lowest total life cycle cost.

The following work plan is representative of the guidelines set forth by the Society of American Value Engineers (SAVE) International. Our approach in conducting VE studies will follow these guidelines.

## PRE-STUDY PROCEDURES

*Information Phase:* Work in this phase is initiated prior to the VE Study and continues to the first day of the study week. The VE Team Coordinator (Leader) will conduct a Coordination Meeting with the Owner/Client, other agency representatives, and the A/E. The meeting will establish objectives and constraints of the VE Study, confirm agenda items, date and location of the study, and coordinate review of the materials. Documents, such as the cost estimate, basis of design and drawings are typically made available one week prior to the VE Study.

## VE STUDY

At the study, our team will require copies of the project specifications, design calculations, records of utility costs, life cost basis use by designers, and pertinent letter, memoranda, meeting minutes relative to the project scope. The design team presents a detailed project briefing on the first morning of the VE Study week, followed by a Q&A session. Owner representatives leave the VE team, which continues with the functional analysis of the various components of the project, setting the stage for the Creative Phase.

*Creative Phase:* The VE Team utilizes the “brainstorming” technique to generate numerous alternatives to accomplish the functions of the item under study. All team members participate in this session (mechanical, electrical, architectural, etc.)

Analytical Phase: The process of eliminating those alternatives generated during the Creative Phase, which are not considered feasible, begins with the Analytical Phase. Each idea is analyzed and rated for their effect on a whole range of items, such as aesthetics, constructability, schedule, design schedule, life safety, future expansion, maintainability, operational performance, spare and repair parts, reliability and ease of implementation.

Development Phase: VE alternatives remaining from the Analytical Phase are fully developed to a point where they can be compared with the original design, from the point of view of feasibility and cost. The techniques of life-cycle costing are used, to include consideration for interest rates, escalation, and service life components. Those components of LLC which include operation, maintenance, repair/replacement costs and those comprising capital costs segments of the LLC are evaluated/reported separately.

Pre-presentation Meeting: The VE team meets with the designers to review the VE alternatives to ensure their compliance with state and local codes, funding schedule, and public hearing issues, and to ensure that the VE alternatives being considered are viable.

Presentation Phase: This phase concludes the VE Job Plan. The alternatives are verbally presented, summarizing each of the VE ideas developed by the VE team. This includes sketches and a summary of the as-designed versus VE alternatives.

Post- Study Phase: The VE Study report, incorporating all of the work generated during the VE week is prepared for delivery within 5 working days to the client. The report includes an overall project description, summary of VE results, technical description of VE alternatives, and a breakdown of initial cost savings, estimated redesign effort, and a comparison of Life-Cycle Costs. The VE report is distributed to the client, designers and other key participants.

## **CONSTRUCTION**

VE can also be used during post-award phases of a project. Value Engineering Change Proposals (VECP's) are post-award value engineering proposals made by construction contractors during the course of construction under a value engineering clause in the contract. VEPC's are often described as a construction contract provision which encourages the contractor to propose changes in the contract requirements which will accomplish the project's functional requirements at a less cost or improve value or service at no increase or a minor increase in cost. The net savings of each proposal is usually shared with the contractor at a stated reasonable rate.

During this phase the owner must consider contractor-generated proposals very carefully, from a life-cycle perspective and a liability perspective. The A/E team is brought in to the decision-making process to agree to the proposed change as not having any negative impact on the overall design and project function. The evaluation of a VECP is treated similarly to any change order during construction, with issues such as schedule and productivity impacts being considered along with the perceived cost savings generated.