Value engineering efforts to reduce the cost

Profession

Value Engineering is defined as “ an organized effort directed at analyzing the functions of systems, equipment, facilities, services and supplies for the purpose of achieving the essential functions at the lowest life cycle cost consistent with the required performance, reliability, quality and safety". Numerous other terms (value management, value analysis, etc.) are also used when referring to VE. While there are subtle differences among these terms they all refer to-generally the same process. There types of benefits associated with the VE exercise in the current case are –

• First Cost Reduction: These reductions are attributed to the VE program only when required project functions or features can be delivered at the reduced cost. Simple cost cutting - e. g. reducing cost at the expense of required features or functions - is not VE. VE first cost reductions are counted as VE savings to the extent that dollars are withdrawn from approved budgets based on the results of VE studies. • Life Cycle Cost Reduction: LCC reductions are based on the aggregate of first cost and anticipated future cost in maintenance and operations.

When additional first cost is required to implement a specific VE suggestion, this can be offset by other VE suggestions which reduce initial cost. If the project budget must be increased to accommodate the additional investment, first cost savings derived from other projects may be used for this purpose after appropriate approvals. As long as they do not entail first-cost project budget increases, VE suggestions based on apparent life-cycle cost reductions may be adopted without formal LCC analysis. However, LCC reductions will be counted as VE LCC savings only when supported by sufficient economic analysis.

• Value Improvement: Value improvement is a subjective expression referring to a projected or apparent favorable shift in cost/worth ratio. The objective of all VE suggestions is value improvement, whether or not cost reductions are involved. VE suggestions maybe to reduce life cycle cost with no reduction or a lesser reduction in worth, to increase worth with no increase or a lesser increase in life-cycle cost, or (ideally) to increase worth and reduce cost. All VE suggestions which involve adjustments in worth should be related to specific forms of such adjustment (e. g. , productivity, flexibility, expandability, aesthetics, etc.

), whether or not they also involve cost adjustments. Following two studies were conducted as part of the VE exercise: • The completion ofConcept Design• The completion of Tentative Design As it is a new construction projects, the first study at Concept Design is intended to review basic design decisions that pertain to areas such as: • Siting and building orientation • Building form, shape and massing • Layout • Occupiable to gross area relationships • Design criteria • Building systems selection options • Space program options • Building space/volume parameters • Vertical and horizontal circulation

• Major Mechanical-Electrical-Plumbing (MEP) considerations • Overall energy considerations • Site access/egress • Overall phasing/scheduling plans (as appropriate) • Sub-soil conditions and geological data • Utility availability The second study at Tentative Design will focus on more detailed design decisions including (as applicable): • Specific building system design • Specification and performance requirements • Proposed design details •

Layout options within overall building geometry • Specific MEP system selections • Site paving, grading and utilities • Phasing and scheduling plans

• Major constructability issues The basic approach is intended to consider macro level issues at Concept Design and more micro level issues at Tentative Design. In general, decisions made as a result of the first study will not be reconsidered in the second study unless significant new information is available. Furthermore, design changes implemented as a result of the studies will generally be considered to be within the bounds of the normal design process. VE Job Plan The recommended VE methodology (Job Plan) used by the VE team during the Workshop had five distinct phases. Briefly, these phases are:

1. Information Phase: During this phase, the VE team gains as much information as possible about the project design, background, constraints, and projected costs. The team performs a function analysis and relative cost ranking of systems and sub-systems to identify potential high cost areas. 2. Speculative/Creative Phase: The VE team uses a creative group interaction process to identify alternative ideas for accomplishing the function of a system or sub-system. 3. Evaluation/Analytical Phase: The ideas generated during the Speculative/Creative Phase are screened and evaluated by the team.

The ideas showing the greatest potential for cost savings and project improvement are selected for further study. 4. Development/Recommendation Phase: The VE team researches the selected ideas and prepares descriptions, sketches and life cycle cost estimates to support the recommendations as formal VE proposals. 5. Report Phase: The

VE consultant will work in concert with the A-E and the PBS representative to produce a preliminary written VE Report which is intended to represent the results of the VE workshop activities, and meet the VE Program objectives.

Finally, post workshop, all the suggestions were collated and classified into three categories of high, medium and low complexity. The suggestions associated with the current projects were as follows – • Modification of architectural designs: The hangar roof was designed to be an opaque structure. This roof can be made transparent through the ample use of the transparent glass which would allow more volume of sunlight. The high amount of sunlight during the day would result in the low usage of electricity and hence reduction in the variable cost of the running the hangar.

• Substitution of building wall material: Building wall material is designed to be made up of steel which can be replaced with high grade brick. The brick would also keep the temperature under control within the hangar. • Reuse of existing materials such as fencing: The material used in fencing can be reused in the construction activity asthe fencewould not be required eventually. • Use of Solar power: The Solar power can be effectively used to heat the water as well as to provide the night time lighting. This would reduce the variable cost of running the hanger. References

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