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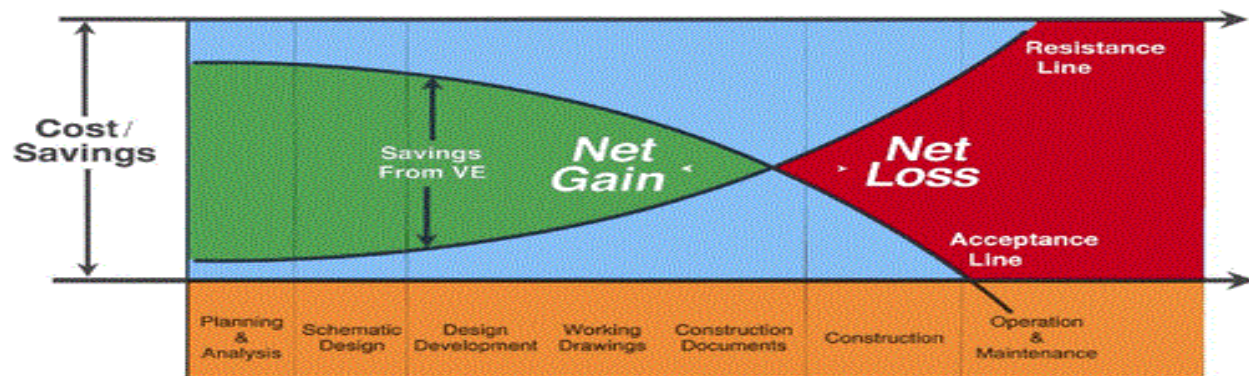
Value Engineering for Optimum Acoustics, Noise & Vibration Control, Speech & Music Communication and/or Privacy

Value Engineering (VE) is a procedure designed to seek out optimum value for both initial and long-term investment. It is not a design/peer review or a cost-cutting exercise. VE is a creative, organized effort, which analyzes the requirements of a project for the purpose of achieving the essential functions at the lowest total costs (capital, staffing, energy, maintenance) over the life of the project. Through a group investigation, using experienced, multi-disciplinary teams, value and economy are improved through the study of alternate design concepts, materials, and methods without compromising the functional and value objectives of the client.

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 three main stages of a project and VE's application are described below.

Value Engineering, as it pertains to acoustics, noise & vibration control, speech & music communication and/or privacy, involves numerous elements of the facility design and construction, including:

- Site layout and neighborhood environment
- Building shell, roof, and windows
- Interior walls, doors, and floor/ceiling, and interior room finishes
- Audio / video presentation systems
- Mechanical and electrical systems and equipment



**Optimum timing for obtaining value engineering input concerning acoustics,
noise & vibration control, speech & music communication and/or privacy**

Planning

At the Planning stage of development, there are additional benefits to be derived from Value Engineering for optimum acoustics, noise & vibration control, speech & music communication and/or privacy. The project team can:

- Review the program
- Perform a functional analysis of the facility
- Obtain the owner/users definition of value
- Define the key optimum acoustics, noise & vibration control, speech & music communication and/or privacy criteria and objectives for the project
- Offer alternative solutions
- Verify if the budget is adequate for the developed program

The benefits are tremendous.

- 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 experienced and independent consultant can bring a fresh outside view of alternate solutions from other similar projects.

Design

This is the stage that most VE participants should become involved - when the design has at least made it to the schematic stage. Most government agencies require at least one VE session at the design stage on projects over a certain \$ size.

At this stage, there is an opportunity to bring the design team and client together to review the proposed acoustics, noise & vibration control, speech & music communication and/or privacy 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.

Methodology and Approach

During the project's schematic stage, study, a five-step Job Plan is followed. The five key steps are described as follows:

Information Phase:

- Understand the background and decisions that have influenced the development of the design through a formal design presentation by the design A/E.
- Analyze the key functional issues governing the project. The functions of any facility or system are the controlling elements in the overall VE approach. This procedure forces the participants to think in terms of function, and the cost and impacts associated with that function.
- Define Owner's key acoustics, noise & vibration control, speech & music communication and/or privacy objectives and criteria governing the project.
- Determine Owner's definition of Value.

Speculation (Creative) Phase:

The project team thinks of as many ways as possible to provide the necessary acoustics, noise & vibration control, speech & music communication and/or privacy functions within the project areas at a lesser initial or Life-Cycle Cost which represent improved value to the client.

- Judgment of the ideas is prohibited.
- The project team is looking for quantity and association of ideas, which will be screened in the next phase of the study.
- Many of the ideas brought forth in the creative phase are a result of work done in the function analysis. This list may include ideas that can be further evaluated and used in the design.

Evaluation (Analysis) Phase:

In this phase of the Project, the project team works together with the Client and/or Users.

- Defines the key acoustics, noise & vibration control, speech & music communication and/or privacy criteria to be used for evaluation.
- Analyses and judges the ideas resulting from the creative session. Ideas found to be impractical or not worthy of additional study are discarded. Those ideas that represent the greatest potential for cost savings and value improvement are developed further. A weighted evaluation is applied in some cases to account for impacts other than costs (such as schedule impacts, aesthetics, etc.).

Development Phase:

During the development phase of the VE study, many of the ideas are expanded into workable solutions. The development consists of:

- Description of the recommended design change.
- Descriptive evaluation of the advantages and disadvantages of the proposed recommendation.
- Cost comparison and LCC calculations.
- Each recommendation is presented with a brief narrative to compare the original design method to the proposed change.
- Sketches and design calculations, where appropriate, are also included in this part of the study.

Presentation Phase:

The last phase of the VE Study is the presentation of the recommendations in the form of a written report. The recommendations, the rationale that went into the development of each proposal, and a summary of key cost impacts are presented at that time so that a decision can be made as to which design concepts will be accepted for implementation and incorporation into the design documents.

In addition to the monetary benefits, VE provides a valuable opportunity for key project participants to come together, then step aside and view the project from a different perspective. The VE process therefore produces the following benefits:

- Opportunity to explore all possible acoustics, noise & vibration control, speech & music communication and/or privacy alternatives
- Forces project participants to address "value" and "function"
- Helps clarify project objectives
- Identifies and prioritizes Client's value objectives
- Implements accepted proposals into design
- Provides feedback on results of the study

Construction

During this phase value engineering is still possible through the use of Value Engineering Change Proposals (VECP). Contractors can be provided monetary incentives to propose solutions that offer enhanced acoustics, noise & vibration control, speech & music communication and/or privacy value to the owner, and share in the financial benefits realized. Clearly the owner must consider contractor-generated proposals very carefully, from a life-cycle perspective and a liability perspective. The project design team must be brought in to the decision-making process to agree to the proposed change as not having any negative impact on the overall design and building 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.

Conclusion

In the final analysis, Value Engineering for achievement of optimum acoustics, noise & vibration control, speech & music communication and/or privacy is not only beneficial, but essential because:

- The functionality of the project is often improved as well as producing tremendous savings, both initial and Life-Cycle Cost.
- A "second look" at the design produced by the architect and engineers gives the assurance that all reasonable alternatives have been explored.
- Cost estimates and scope statements are checked thoroughly assuring that nothing has been omitted or underestimated.
- Assures that the best value will be obtained over the life of the building.

Visit www.SpectraTechLtd.com for more information concerning these services.

Major Resources

- Techniques of Value Analysis and Engineering, 3rd ed. by L.D. Miles. New York, NY: McGraw-Hill, 1972.
- "The Dread of VE: Understanding Why It's Not Used More" in Value World by Scot McClintock. Vol. 11, No. 4, Jan./Feb./Mar. 1989, pp. 12-14.
- Value Engineering: Practical Applications for Design, Construction, Maintenance, & Operations by Alphonse J. Dell'Isola. Kingston, MA: R.S. Means Company, Inc., 1999.
- Value Engineering Theory, Revised Edition by Donald E. Parker. Washington, DC: The Lawrence D. Miles Value Foundation, 1995.
- [Value: Its Measurement, Design, and Management](#) by M. Larry Shillito and David J. De Marle. New York, NY: John Wiley & Sons, Inc., 1992.
- Value Management Practice by Michel Thiry. Sylva, NC: Project Management Institute, 1997.

The above information is based on:

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