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## **Value Engineering: The Good, the Bad, and the Better**

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Value Engineering, or VE, is a concept that was conceived by General Electric (GE) during World War II. Faced with material and labor shortages, GE instituted a process designed to identify substitute materials and processes that would reduce costs or improve functionality and performance. This process of re-engineering products to improve cost-effectiveness and value gained steam and eventually GE developed a systematic procedure to apply to all of its products. The success of that effort led many industries, including the construction field, to apply the same VE principles.

Today, project owners are turning to VE as a method to minimize waste and cost and to maximize functionality and profitability on new construction projects. Performed correctly, VE is advantageous for all parties involved and presents income opportunities for design firms who become certified value engineers. Performed incorrectly, however, VE presents the potential for added costs, time and liabilities to the design firm of record.

Let's take a closer look at the good and the bad of VE, and how you can make the process work better for you in the future.

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## The Good

Value Engineering refers to a detailed, systematic set of procedures implemented to achieve optimum value. The procedures typically involve:

- Gathering information about a product or function
- Analyzing the current engineering of the product or function
- Brainstorming creative alternatives to re-engineering the product or function
- Evaluating and testing the most promising ideas to create value
- Developing and presenting the best VE approach
- Implementing the new engineering process
- Tracking results and following up as necessary.

Applied to a construction project, the goal of this VE process is to eliminate or re-engineer design and construction features that add cost but do not add corresponding value to a project. “Value” is typically measured as improved quality, functionality, life, utility and/or appearance.

With VE, certified value engineers analyze design concepts, specifications, construction techniques, materials, building systems, building types, and up-front versus life-cycle costs to arrive at a plan for achieving the best overall value. Often, the value engineer works closely with the architect or engineer of record. In fact, many value engineers prefer to include the designers on their VE teams.

This formal or “scheduled” VE is best planned at the onset of the project as an integral part of the design process. Ideally, a VE team includes the value engineer, key representatives of the owner, the prime design professional, the contractor, the construction manager (if any) and the project’s professional cost estimator (if any).

Through formal meetings, the group identifies potential savings and improvements, large and small. The owner and the prime design professional evaluate these findings and discuss the impact of the group’s

recommendations on the project. Key to the cost-effectiveness of this approach is that the owner’s decisions are implemented by the prime design professional during the initial design development phase, thereby eliminating the need to go back and revise schematic design documents. Carried out in this manner, VE can be an enormous benefit to both the owner and the design professionals as a way of verifying the planning, design and financial wisdom of their decisions.

## The Bad

As with many systematic procedures that require a high level of expertise, Value Engineering has spawned some wannabe copycats. Throughout many industries, uncertified individuals have attempted to market their services as Value Engineering while, in reality, they are performing scaled-down services that focus primarily on cost-cutting, rather than value-building or cost effectiveness.

Within the construction industry, VE is sometimes used to describe a process marketed to project owners as a cost-cutting tool. This “informal” value engineering can be performed by design professionals, general contractors, construction managers, cost estimators or others who are not certified value engineers.

These cost consultants often provide advice to the owner throughout all phases of the project. There is usually no formal, pre-scheduled value engineering process. Recommendations to cut costs can occur late in the design process, usually without considering compensation for the added work for the design firm of record. Worse, cost-cutting changes can be made to the original design during the construction phase, sometimes without the designer being notified.

Worst case, this informal cost-cutting process can deteriorate into what amounts to unscheduled second-guessing of the original designer by the consultant hired to cut costs with little concern for long-term value. In fact, some of these so-called VE firms base their compensation on how much money they save the owner. This poor substitute for formal VE can undermine the designer of record and reduce the quality of the project.

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Too often, this type of informal VE excludes or severely limits the involvement of key team members. Typically, the consultant unilaterally makes cost-cutting recommendations to the owner. The owner then decides what changes to make in the project scope, building systems or materials, and directs the design professional to revise the design concepts and previously prepared documents accordingly.

There are several issues to consider here. Introducing this informal VE late in the course of the project – particularly during or after the construction documents phase – can be risky and expensive. You and your project team will face a whole new set of problems and potential liabilities.

Late VE can disrupt the design and construction drawing preparation process. It may mean rethinking fundamental decisions and call for subsequent redesign and reproduction of construction documents to reflect the changes. All this will require additional time that will impact schedules and budgets. The result can be reduced quality, increased life-cycle costs and an unhappy client – all resulting in increased liabilities.

Certainly, if this informal VE results in adversarial relationships, there is a much greater likelihood of conflict and claims. There is also a greater potential for errors in revising the construction documents after bids have been received because of the tight time and budget constraints under which such revisions typically need to be made. Changes made in haste may not allow for proper coordination and checking. There is often significant pressure to accept a lesser level of quality or inferior products or building systems – although these cheaper alternatives may significantly increase the costs of operation and maintenance over the life of the project.

### **The Better**

Properly executed, Value Engineering can lead to a better project for all parties involved, including the design firms. VE can identify better ways to build a mousetrap – and your client’s project. You can learn of new techniques, new systems and new materials from a qualified value engineer. VE can result in projects that apply the latest in technology and result in

high performance buildings with improved sustainability, greater energy efficiency and a longer, more profitable lifecycle.

Clearly, however, any design firm that hears the words “Value Engineering” associated with one of its projects should take notice. Ascertain whether the project owner is indeed hiring a certified value engineer. Determine whether a formal VE process is being instituted from the earliest design stage or whether it’s really just a cost-cutting exercise in disguise.

Here are some important questions you should consider:

- Who is the value engineer? Is he/she certified? What is his/her track record?
- Is the value engineer’s compensation based solely or largely on the amount of cost savings generated?
- Does the VE process begin at the early design stage?
- What is my role in the VE team?
- If my design is evaluated and re-engineered, what is the extent of my responsibility to modify it?
- How will I be compensated for re-design work?
- What is my recourse if I disagree with the value engineer’s recommendations?
- Do I have a responsibility to make changes that I believe are inappropriate?
- What happens if the changes affect the permits or licenses obtained for the original design?
- What if a lawsuit results from the redesign; am I liable?

Develop a clear understanding with your client as to the extent of your obligations to redesign in order to accommodate decisions based on the VE process. Your contract should include a clause to limit responsibility and liability for redesign imposed by others and to give you the ability to object to the recommendations of the value engineer. In addition, make certain any redesign you provide will be performed as an additional service and compensated for accordingly.

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Of course, if you feel there is a threat to public health and safety if certain recommendations are implemented, document your refusal to make such changes and follow up with both the value engineer and your client to try to reach a resolution. If your concerns are not allayed, you may have a duty to notify appropriate building safety agencies in accordance with your obligations under your license. Seek legal counsel before proceeding.

### **Conclusion**

During the design process, you engage in your own form of VE each and every day. You've made thousands of cost-benefit decisions based on your knowledge and experience. The quality of these decisions largely depends on your understanding of the owner's expectations, desires and requirements. Frequent, open and clear communication allows you to consider alternative solutions, propose choices for the owner, try different approaches and deliver creative and cost-effective design solutions.

If an owner proposes Value Engineering, point out that while VE can add value, it doesn't always translate into cost savings. The process typically adds additional design development fees with no guarantee of reduced construction or maintenance costs. The goal is long-term cost-effectiveness and value, not up-front cost reduction.

### **Can We Be of Assistance?**

*We may be able to help you by providing referrals to consultants, and by providing guidance relative to insurance issues, and even to certain preventives, from construction observation through the development and application of sound human resources management policies and procedures. Please call on us for assistance. We're a member of the Professional Liability Agents Network (PLAN). We're here to help.*