VALUE ENGINEERING
A PRACTICAL APPROACH FOR OWNERS, DESIGNERS AND CONTRACTORS
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Preface

Spiraling construction costs and an ever-increasing tightening of money have fostered a need for controlling and managing costs. Federal agencies, through their various construction grants programs, have adopted Value Engineering as a means of stretching construction dollars and at the same time improving the performance and reliability of the end product. Constraints on spending, tightening of investment dollars and a desire to obtain the maximum value for each dollar spent have helped increase the acceptance of value engineering.

The initial success of value engineering on construction projects within the General Services Administration (GSA), and the Environmental Protection Agency (EPA) has brought about an awareness of the merits of value engineering by architects, engineers and contractors. Initially, VE studies were conducted under the direction of a Certified Value Specialist (CVS), an accredited professional value engineer certified by the Society of American Value Engineers (SAVE). Now, engineers and architects are conducting value studies and often run into pitfalls not readily apparent.

This book is a how-to-do-it book! Its purpose is to explain the ins and outs involved in conducting a value engineering study. The book is intended to express the practical rather than the theoretical aspects of value engineering. Many books have been written about value engineering as it relates to the manufacturing field with emphasis on the theory behind it. The authors have drawn freely from their experience in conducting value engineering seminars and studies in compiling the major contents of the book. Every attempt has been made to address the key elements of value engineering and to provide examples of actual case studies.

The authors have attempted to exclude material of a general nature that appears in many value engineering texts and instead have concentrated on value engineering as it relates to the construction industry. The key elements the authors wish to cover are the background of value engineering in the construction industry, the tool-kit of value engineering, managing and conducting a value engineering study, and an in-depth explanation of the value engineering job plan with successful examples of its results. Examples of actual value engineering cases provide the reader with a guide for applying value engineering in their own work. It is hoped that the examples and the accompanying written description will give the reader adequate comparison material to serve as a guide for his/her work.
During the past 22 years over 5000 people have attended value engineering seminars conducted by Glen Hart. These seminars included people from the fields of manufacturing, research, construction, procurement, purchasing, software, hardware and the like. Many of these people have encouraged Glen to summarize the contents of the VE seminar in book form. A large portion of this book is based on Glen's 22 years of experience conducting VE seminars and leading value programs. This material is augmented with technical data, cost control techniques, energy modeling, life-cycle costing models, and the management approach that the authors used in conducting value engineering studies in the construction field.

Much of the stimulus to write a text on value engineering has been generated by the results of the value engineering studies. Time and time again unnecessary life-cycle costs have been drastically reduced resulting in substantial savings to the owner. When comparing the savings for value engineering studies to the study costs, the results have been astonishing. Return on investment ratio (savings divided by cost of study) have ranged from as high as 485:1 to 2:1. Results of this nature applied throughout the construction industry are impressive. It is estimated that if 3 to 5 percent of the cost of construction were eliminated (within the realm of possibility with value engineering) the Environmental Protection Agency would be able to fund thousands of additional wastewater treatment construction projects as some projects cannot be funded due to a shortage of money.

It is the hope of the authors that the contents of the book will benefit managers, engineers, architects, contractors, developers, politicians and others responsible for ensuring that we receive the maximum value for our money and that teachers and students will find the book useful in their curriculums.

Early efforts at value engineering were directed toward the manufacturing field where a savings in a product would be magnified by the number of times the product was produced. Value engineering in construction came to the forefront in the 1960s when construction costs were changing faster than estimators could keep track of the fluctuating costs. The enormous amount of construction money expended and the potential for cost savings has thrust value engineering to the forefront of the industry.

The authors of the book have been fortunate to be involved in the development of many of the federal government's first endeavors into value engineering studies and to have conducted 40-hour value engineering workshops to train many of the architects and engineers in the field today. Many of the ideas and concepts expressed in the book are the result of experience gained from these individuals to whom we owe our thanks. In addition, the requirements for value engineering of federal construction projects has stimulated the challenge to our profession to maximize the value of our product.

Our thanks to Arthur Beard Engineers, Inc. and Smith Hinchman & Grylls Associates, Inc. and especially to the participants in value engineering workshops who have been helpful in providing much of the case history text material from studies conducted by the authors. Writing any book requires
motivation and we thank our wives, June and Sue, and our colleagues for their support and ego-building during preparation of the manuscript. Our thanks goes out to all of you.

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Contents

Preface v

1. Introduction and Background of Value Engineering 1
   Definition of Value Engineering 7
   All Designs Have Unnecessary Costs 5
   The Reasons Poor Value Occurs 6
   Background and History of Value Engineering 10

2. Habits; Roadblocks and Attitudes 19
   Habit Ruts 20
   Attitudes 23
   The Attitude Screen 27
   It Can't Be Done 29
   The Power of a Positive Attitude 30
   Realizing Our True Potential 31

3. The Value Engineering Job Plan 32
   Introduction 32
   The Inventive Process 32
   Reasons for Using the Job Plan 32
   The Job Plan 34

4. Function Analysis 60
   Function and Its Role in Achieving Value 60
   Criteria Used to Evaluate Value 62
   Function: An Approach to Obtaining Value 63
   Quantifying Function in Terms of Its Cost and Worth 67
   Graphical Function Analysis 71
   Evaluate by Comparison 71
   Advantages of Function Analysis Approach 73
   Functional Analysis Systems Technique (FAST Diagramming) 74
# CONTENTS

5. Creative Thinking  83

- Introduction  83
- Definition of Creative Thinking  84
- Creative People  84
- Characteristics of Creative People  87
- Creative Processes (Toolkit of Creativity)  89
- Psychological Basis of Creativity  91
- What Stimulates Creativity?  93
- What Stifles Creativity?  94
- Conducting a Creative Session  97
- Crux of Creative Thinking  98
- The Creative Process  100
- Creative Problem-Solving Techniques  100

6. Managing the Value Engineering Study  103

- Why the Program Works  103
- The Relationship Between Owner-Designer and Value Engineering Consultant  107
- Who Influences the Cost of a Project?  109
- Facility Life-Cycle Process  112
- Who Influences the Cost of a Project?  121
- When is the Owner Ready for Value Engineering?  121
- Selecting a VE Consultant  123
- Staffing and Structuring Teams for a VE Study  124
- Conducting a VE Project Study  129

7. Cost Modeling  141

- Cost Validation  142
- Cost Estimating  142
- Cost Models  144
- Matrix Cost Model  144
- Functional Cost Models  145
- Uses of Project Models  147

8. Life-cycle Costing  150

- Definition of Life-cycle Costing  150
- Purpose and Implications of Life-cycle Costing  151
- Economic Principles Used in Life-cycle Costing  152
- Accounting for Escalation  152
- Types of Life-cycle Costs  156
- Using Life-cycle Costing as a Tool  160

9. Energy  173

- Introduction  173
- Energy Resources and Consumption  173
- Energy Cost Escalation  176
- Sources of Energy Supply  178
- End Use of Energy  179
- Energy Embodiment of Construction Materials  179
Transportation Systems 182
Water and Wastewater Treatment 185
Building and Energy Design 187
Factors Affecting Energy Consumption 190
Energy Models 193
Analyzing Building Energy Use 193
The Building as a Heat Body 196
Factors Impacting Energy Consumption 196
Key Factors Affecting Energy Consumption in Buildings 208
Impact of Maintenance on Energy Savings 212
Demand Charges for Electrical Energy 212
Energy Prospectus 213
Areas of Potential Energy Savings in Plant Design 213

10. Value Engineering Case Study No. 1: Wastewater Treatment Plant 216

Introduction 216
Treatment Plant Service Area 216
Project Requirements 217
Description of Project 217
Organization and Staffing of VE Teams 217
Description of VE Workshop 218
Information Phase 218
Creative Phase 221
Judgment Phase 221
Development Phase 221
Recommendation Phase 222

11. Value Engineering Case Study No. 2: Wastewater Treatment Plant 235

Project Requirements 235
Description of Project 236
Organizing and Staffing of VE Teams 237
Description of VE Workshop 238
The VE Workshop 239
Cost Model 239
Functional Analysis 241
Creative Phase 243
Judgment Phase 243
Development Phase 243
Recommendation Phase 243
Examples of Implemented VE Recommendations 248
Designer's Response 248

12. Value Engineering Case Study No. 3: Engineering Management Building 257

Building Requirements 258
Description of Project 258
VE Project Team 261
Description of VE Workshop 261
Examples of VE Recommendations 267
<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. 40-hour VE Workshop Seminars</td>
</tr>
<tr>
<td>What do Participants Need to Bring to a 40-hour Workshop Seminar?</td>
</tr>
<tr>
<td>Bibliography</td>
</tr>
<tr>
<td>Index</td>
</tr>
</tbody>
</table>
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