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REPORT OF THE
DEPARTMENT OF GENERAL SERVICES

VALUE ENGINEERING OF STATE AGENCY CAPITAL OUTLAY PROJECT

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

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EXECUTIVE SUMMARY

I. Introduction

The Director of the Department of General Services is required by Section 2.1-483.1:1 of the Code of Virginia to report to the Governor and the General Assembly on or before September 15 of each year the (i) number and value of the state capital projects where value engineering (VE) was employed and (ii) identity of the capital projects for which a waiver of the requirements of Section 2.1-483.1:1 was granted, including a statement of the compelling reasons for granting the waiver. The last report submitted was for calendar year 1998. This report provides information for the period of August 1, 1998 through July 31, 1999

II. Projects

Of all capital outlay projects under some stage of design during this reporting period, thirteen (13) projects with an estimated construction value of $175,144,000 qualified for Value Engineering as required by Section 2.1-483.1:1 of the Code of Virginia and Section 814.0 VALUE ENGINEERING of the Commonwealth of Virginia **Construction and Professional Services Manual for Agencies,** December 1996 (CPSM).

III. Savings

Twelve projects were value engineered during the period with a total estimated construction value of $164,344,000. Estimated savings recommended by the value engineering teams and accepted by state agencies totaled $6,091,400, or 3.7% of the estimated construction value.

IV. Waivers Granted

One waiver of the VE analysis of a project with an estimated construction cost greater than $5,000,000 was granted.

VALUE ENGINEERING OF STATE CAPITAL OUTLAY PROJECTS FOR THE PERIOD AUGUST 1, 1998 - JULY 31, 1999.

1. Introduction

The Director of the Department of General Services is required by Section 2.1-483.1:1 of the Code of Virginia to report by September 15 each year to the Governor and the General Assembly on the (i) number and value of the capital projects where value engineering (VE) was employed and (ii) identity of the capital projects for which a waiver of the requirements of Section 2.1-483. 1:1 was granted, including a statement of the compelling reasons for granting the waiver. This report provides the information for the period August 1, 1998 - July 31,1999.

2. Background,

Section 2.1-483.1: 1 of the Code of Virginia establishes the requirement for use of value engineering on any capital project costing more than five million ($5,000,000) dollars. This requirement became effective in 1994 and procedures for implementing a value engineering program were developed and issued to state agencies in July 1994.

Value engineering is a systematic process of review and analysis of a project design performed by an independent team of persons not originally involved in the design of the project. The team members are themselves licensed design professionals and the team leader is specially trained in conducting the team study process.

The purpose of the review and analysis of the design is to offer suggestions to the project owner and project design firm that improve project quality and reduce total project cost by combining or eliminating inefficient or expensive parts or steps in the original design or recommending the total redesign of the project using different technologies, materials or methods. Value engineering is often used to deal with cost growth problems during project design. In some cases, a VE study may result in an increase in cost of portions of a project. This generally occurs when the team recommends a design change that may involve a higher initial investment during construction, but is more cost effective when measured on a life cycle basis (construction cost plus long term operating costs).

Not all projects are candidates for VE. Where an initial analysis of a project indicates that the cost of conducting the VE study may not produce sufficient recommendations of cost savings to cover study costs, there is no potential net benefit in conducting the study.

Current state procedures require any capital project with an estimated construction cost greater than $5,000,000 to be value engineered, unless waived by the Director of the Department of General Services. The VE study is conducted at the preliminary design stage of the project. The project design is approximately 35% complete at the preliminary design stage.

The Commonwealth process involves a 40-hour study of the project by the VE team. The team is composed of registered design professionals that practice architecture and the engineering disciplines (civil, electrical, mechanical, etc.) involved in the project design and a certified value specialist who is the VE team leader. The A/E firm that designed the project is a part-time participant in the VE study. Building shape, floor plan layout and building systems components are sufficiently developed at the preliminary stage of design for all VE team disciplines to evaluate the essential elements of the design and suggest alternatives where appropriate.

The recommendations produced by the VE team are reviewed by the project owner and the design A/E firm. Recommendations are selected or rejected by the project owner in consultation with the design A/E based on program requirements, cost, technical feasibility, esthetics and other related considerations.

Recommendations dealing with technical design issues must ultimately be accepted or rejected by the design A/E firm since the design A/E is the party with ultimate liability for the design and is required by law to professionally seal the design documents.

Accepted recommendations must be incorporated into the project design and most often this will require additional work on the part of the design A/E. Since the nature and scope of this additional work is not known when the A/E design contract and price are negotiated, the A/E is entitled to a fee for this additional design service.

Five of the twelve projects evaluated during this report period were designed using abbreviated procedures for capital outlay projects authorized by Section 4-5.08.b. of the 1997 Acts of Assembly, Chapter 924. Under this provision, five designated colleges and universities were authorized to enter into a two-year pilot project in which each named agency was delegated all post-appropriation review, approval, administrative and policy and procedure functions performed by the Department of Planning and Budget, Department of General Services and the Division of Engineering and Buildings.

3. Projects Studied and Savings Identified

The twelve projects that were value engineered are listed in the table on the next page. The estimated construction value of the six projects was $164,344,000. The VE teams identified design changes to the projects that were acceptable to the agency that produced an aggregate estimated savings in construction cost of $6,091,400. The **largest** single project estimated savings identified and accepted by an agency was $1,300,000. The **smallest** single project estimated savings identified and accepted by an agency was $68,200 and the **mean** estimated savings identified and accepted by an agency was $300,000 and the **average** was $507,617. In one case there were no savings recommendations accepted.

4. Study Costs

The typical cost of a 40 hour VE study is approximately $35,000. Based on the studies completed this period the Commonwealth realized net savings in estimated construction cost of $5,671,400.

5. Waivers Granted

One waiver of the requirement to conduct a value engineering study of a project was granted. This waiver was granted for the VCU Sanger Hall Improvements project. The primary work was a replacement-in-kind of mechanical equipment, curtain wall improvements developed based on an extensive study of the cost effectiveness of three options considered and emergency electrical power work needed to improve life safety and to support program requirements. The estimated construction cost of the project was $10,800,000.

1999 Value Engineering Studies
Summary Report

Project Code	Agency / Institution	Project Title	Preliminary Construction Budget	Estimated VE Savings (Accepted Items)	VE Savings as a % of Budget	Remarks
146-15793	Science Museum of Virginia	Phase III B & C Renovations	$6,891,000	$186,000	2.7%	
207-15924	University of Virginia	Bio-Med. Engineering/Med. Science Bldg.	$32,000,000	$1,300,000	4.1%	
207-15961	University of Virginia	East Precinct Chiller Plant	$7,800,000	$1,200,000	15.4%	
207-16094	University of Virginia	Observatory Hill Dining Hall	$8,322,000	($6,900)	-0.1%	Added cost.
208-15803	Virginia Tech	Special Purpose Housing - Phase III	$8,395,000	$68,200	0.8%	
208-15965	Virginia Tech	Upper Quad Conversion - Phase II	$5,230,000	$72,000	1.4%	
211-15860	Virginia Military Institute	Scott-Ship Renovation	$10,404,000	$272,800	2.6%	
214-16087	Longwood College	Renovation of East, West and Main Ruffner	$6,713,000	$356,600	5.3%	
216-16100	James Madison University	Main Campus Parking Deck	$5,389,000	$210,100	3.9%	
221-16150	Old Dominion University	Constant Hall Renovation	$9,000,000	$300,000	3.3%	
221-15870	Old Dominion University	Convocation Center	$35,000,000	$1,000,000	2.9%	
236-16090	Virginia Commonwealth University	Sanger Hall Improvements				See note 1.
242-15915	Christopher Newport University	Performing Arts Center	$40,000,000	$1,132,600	2.8%	
		TOTALs	$175,144,000	$6,091,400	3.5%	

Notes:

1) VCU Sanger Hall (236-16090), with a preliminary budget of $10,800,000, was granted a waiver from the requirements for a VE study for the following reasons: (1) the primary work was a replacement-in-kind of mechanical equipment, (2) the curtain wall improvements were developed based on a study of the cost and effectiveness of three options, and (3) the emergency electrical power work was needed to improve life safety and to support program requirements.