

**VALUE ENGINEERING STUDY  
OF  
EDS-19(64) US 19 SCHLEY  
PI NUMBER: 322730**

**ATLANTA, GEORGIA  
November 20, 2003**

**Prepared by:  
Ventry Engineering, L.L.C.**

**In Association With:  
Georgia Department of Transportation**

**VALUE ENGINEERING STUDY  
TEAM LEADER**

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**Date:** \_\_\_\_\_

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## **I. INTRODUCTION**

## **GENERAL**

This Value Engineering report summarizes the results of the Value Engineering Constructability study performed by Ventry Engineering for the Georgia Department of Transportation. The study was performed during the week of November 20, 2003.

## **VALUE ENGINEERING METHODOLOGY**

The Value Engineering Team followed the basic Value Engineering procedure for conducting this type of analysis.

This process included the following phases:

1. Investigation
2. Speculation
3. Evaluation/Development
4. Report Preparation

Evaluation criteria identified as a basis for carrying the alternatives forward included the following:

- Construction Time
- Constructability
- Traffic Control
- Construction Cost
- Future Maintenance Cost
- Contractor Claims

## **SUMMARY OF RECOMMENDATIONS**

It is the recommendation of the Value Engineering Team that the following Value Engineering Alternatives be carried into the Project Development process for the final plans and specifications.

### **1-CONSTRUCTABILITY**

Value Engineering Alternative Number 1 - Insure that the project on each end of the proposed project will be completed prior to the letting of the proposed project or include plans for temporary connections at each end or a crossover within the project limits and insure that the typical sections for each project match both adjacent projects.

Value Engineering Alternative Number 2-Consider alternate base options to GAB such as soil cement and/or black base.

Value Engineering Alternative Number 3-Eliminate variable slope on the typical section or note that the slopes cannot be greater than 4:1.

Value Engineering Alternative Number 4-Insure that a detail for pavement fabric allows for a minimum of 2" of asphalt over the fabric.

## 2-STAGE CONSTRUCTION

The Value Engineering Team recommends that the following Value Engineering Alternatives be implemented:

Value Engineering Alternative Number 1-Insure that the temporary drainage in each stage is of a temporary type of drainage material, not normal roadway drainage material.

Value Engineering Alternative Number 2-Insure that any existing culverts that are being used as temporary or detour structures are long enough to work without having to be extended.

Value Engineering Alternative Number 3-Insure that existing driveways or roadways can be maintained during each stage of construction, especially on the by pass sections.

## 3-CONSTRUCTION TIME

The Value Engineering Team recommends that the following Value Engineering Alternative be implemented:

Value Engineering Alternative - Change the construction time from 30-36 months to 24 months.

## 4-TRAFFIC CONTROL

The Value Engineering Team recommends that the following Value Engineering Alternatives be implemented:

Value Engineering Alternative Number 1-Remove the pay item for removal of striping which is already included in SP 150.

Value Engineering Alternative Number 2- Remove pay item 652 paint striping entirely.

## 5-BRIDGE DESIGN

The Value Engineering Team recommends that the following Value Engineering Alternative be implemented:

Value Engineering Alternative Number 1-Change the proposed three span bridge over CR 50 to a single span bridge with vertical abutments with MSE walls.

## **II. LOCATION OF PROJECT**

**map**

### **III. TEAM MEMBERS AND PROJECT DESCRIPTION**

## **TEAM MEMBERS**

NAME	AFFILIATION	EXPERTISE	PHONE
William F. Ventry, P.E., C.V.S.	Ventry Engineering	Team Leader	850/627-3900
Richard Marshall	GADOT	Construction	404/656-6503
Stranly Smith	GADOT	Traffic Safety & Design	404/635-8150
Andy Lindsey	GADOT	District Construction	229/931-2434
Lyn Clements	GADOT	Bridge Design	404/656-5289
William McCarter	GADOT	District Construction	229/931-2434

## **PROJECT DESCRIPTION**

This project is the widening and reconstruction of US 19 from SR 271 to SR 240 for 12.0 miles. The proposed US 19 typical section is four 12-foot lanes with a 44-foot depressed median. The project includes twin parallel bridges over CR 50, Buck Creek and the Norfolk Southern Railroad.

#### **IV. INVESTIGATION PHASE**

**EDS-19(64) US 19 SCHLEY  
VALUE ENGINEERING STUDY BRIEFING  
NOVEMBER 20, 2003**

NAME	AFFILIATION	PHONE
William F. Ventry, P.E., C.V.S.	Ventry Engineering	850/627-3900
Roger Holloway	GADOT	404/657-9758
Richard Marshall	GADOT	404/656-6503
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**INVESTIGATION**

The following areas have been identified by the Value Engineering Team as areas of focus and investigation for the Value Engineering process:

- A. CONSTRUCTABILITY
- B. STAGE CONSTRUCTION
- C. CONSTRUCTION TIME
- D. TRAFFIC CONTROL
- E. BRIDGE DESIGN

## **V. SPECULATION PHASE**

## **SPECULATION**

Ideas generated, utilizing the brainstorming method, for performing the functions of previously identified areas of focus.

### **A. CONSTRUCTABILITY**

- Insure that the project on each end of the proposed project will be completed prior to the letting of the proposed project or include plans for temporary connections at each end or a crossover within the project limits.
- Consider alternate base options to GAB such as soil cement and/or black base
- Eliminate variable slope on the typical section or note that the slopes cannot be greater than 4:1
- Insure that a detail for pavement fabric allows for a minimum of 2” of asphalt over the fabric

### **B. STAGE CONSTRUCTION**

- Insure that the temporary drainage in each stage is a temporary type of drainage material, not normal roadway drainage material
- Insure that any existing culverts that are being used as temporary or detour structures are long enough to work without having to be extended
- Insure that existing driveways or roadways can be maintained during each stage of construction, especially on the by pass sections

### **C. CONSTRUCTION TIME**

- Change the construction time from 30-36 months to 24 months

### **D. TRAFFIC CONTROL**

- Remove the pay item for removal of striping which is already included in SP 150
- Remove pay item 652 paint striping entirely

### **E. BRIDGE DESIGN**

- Change the proposed three span bridge over CR 50 to a single span bridge with vertical abutments with MSE walls
- Change the proposed three span bridge over the railroad to a single span bridge with vertical abutments with MSE walls

## **VI. EVALUATION/DEVELOPMENT PHASE**

**VI.(A) ALTERNATIVES**

## **ALTERNATIVES**

The following alternatives were formulated during the "eliminate and combine" portion of the Evaluation Phase.

### **A. CONSTRUCTABILITY**

Value Engineering Alternative Number 1 - Insure that the project on each end of the proposed project will be completed prior to the letting of the proposed project or include plans for temporary connections at each end or a crossover within the project limits and insure that the typical sections for each project match both adjacent projects.

Value Engineering Alternative Number 2-Consider alternate base options to GAB such as soil cement and/or black base.

Value Engineering Alternative Number 3-Eliminate variable slope on the typical section or note that the slopes cannot be greater than 4:1.

Value Engineering Alternative Number 4-Insure that a detail for pavement fabric allows for a minimum of 2" of asphalt over the fabric.

### **B. STAGE CONSTRUCTION**

Value Engineering Alternative Number 1-Insure that the temporary drainage in each stage is a temporary type of drainage material, not normal roadway drainage material.

Value Engineering Alternative Number 2-Insure that any existing culverts that are being used as temporary or detour structures are long enough to work without having to be extended.

Value Engineering Alternative Number 3-Insure that existing driveways or roadways can be maintained during each stage of construction, especially on the by pass sections.

### **C. CONSTRUCTION TIME**

Value Engineering Alternative - Change the construction time from 30-36 months to 24 months.

### **D. TRAFFIC CONTROL**

Value Engineering Alternative Number 1-Remove the pay item for removal of striping which is already included in SP 150.

Value Engineering Alternative Number 2- Remove pay item 652 paint striping entirely.

### **E. BRIDGE DESIGN**

Value Engineering Alternative Number 1-Change the proposed three span bridge over CR 50 to a single span bridge with vertical abutments with MSE walls.

Value Engineering Alternative Number 2-Change the proposed three span bridge over the Norfolk Southern Railroad to a single span bridge with vertical abutments with MSE walls.

**VI.(B) ADVANTAGES AND DISADVANTAGES**

## EVALUATION/DEVELOPMENT

The following Advantages as well as other pertinent information was developed for the Value Engineering Alternatives previously generated during the speculation phase.

### A. CONSTRUCTABILITY

*Value Engineering Alternative Number 1 - Insure that the project on each end of the proposed project will be completed prior to the letting of the proposed project or include plans for temporary connections at each end or a crossover within the project limits and insure that the typical sections for each project match both adjacent projects.*

#### Advantages

- Smooth transition between projects
- Work will not be performed that is unnecessary
- Will avoid any conflicts with two different contractors
- Could eliminate claims for either contractor

#### Conclusion

Carry forward for further development

*Value Engineering Alternative Number 2-Consider alternate base options to GAB such as soil cement and/or black base.*

#### Advantages

- Cost effective alternates that may encourage others to submit bids.
- Quarry locations in relation to this project may result in high trucking cost
- Provides more base options for the contractor to bid on
- More options may encourage more contractors to bid on this work thus we may get the most cost effective product.
- Allows for more competitive bidding.

#### Conclusion

Carry forward for further development

*Value Engineering Alternative Number 3-Eliminate variable slope on the typical section or note that the slopes cannot be greater than 4:1.*

#### Advantages

- Avoids potential clear zone issues
- Could avoid having to rework at drainage structures
- Less erosion
- Easier slope to maintain

#### Conclusion

Carry forward for further development

*Value Engineering Alternative Number 4-Insure that a detail for pavement fabric allows for a minimum of 2" of asphalt over the fabric.*

#### Advantages

- Specifications warranties maybe voided if minimum 2" cover is not achieved.
- Reflective cracking may not be properly sealed and cracks may reappear.

- Contractors will insist on 2” minimum to achieve required results thus additional funds maybe required if we don’t spell out the desired thickness with a detail.
- The specifications for pavement fabric material requires a minimum of a 2” asphalt overlay of the fabric before they will warrant the fabric product
- A detail needs to be shown on how to achieve the 2” cover because if not shown, the contractor may claim for extra funds required to achieve the 2” cover.

Conclusion

Carry forward for further development

**B. STAGE CONSTRUCTION**

*Value Engineering Alternative Number 1-Insure that the temporary drainage in each stage is a temporary type of drainage material, not normal roadway drainage material.*

Advantages

- The contractor is required to supply an “acceptable” drainage structure that gives the desired result of positive drainage.
- Requires that the contractor furnish, install, remove and salvage the temporary drainage structures
- The department does not have to salvage the used material
- Eliminate the Department having to store these items.

Conclusion

Carry forward for further development

*Value Engineering Alternative Number 2-Insure that any existing culverts that are being used as temporary or detour structures are long enough to work without having to be extended.*

Advantages

- A note to clarify this can be added as long as the contractor is aware that they may have to be extended in the overall bid price or by supplying direction in how they will be paid in the event this is necessary.
- Ensures that an adequate typical section can be maintained to facilitate traffic during staging
- It will ensure that their will be an adequate typical section to maintain traffic during staging, thus eliminating any claims for additional funds to correct the problem

Conclusion

Carry forward for further development

*Value Engineering Alternative Number 3-Insure that existing driveways or roadways can be maintained during each stage of construction, especially on the by pass sections.*

Advantages

- More cost effective
- Adjoining property owners are never denied access to their property
- Improves our public relations on this project

Conclusion

Carry forward for further development

## **C. CONSTRUCTION TIME**

*Value Engineering Alternative - Change the construction time from 30-36 months to 24 months*

### Advantages

- Good public relations
- Provides the taxpayers with a completed product sooner
- Reduces GADOT in house administrative cost

### Conclusion

Carry forward for further development

## **D. TRAFFIC CONTROL**

*Value Engineering Alternative Number 1-Remove the pay item for removal of striping which is already included in SP 150.*

### Advantages

- Eliminates paying for something that is covered in the SP 150
- Eliminates duplicate pay methods.
- Saves on cost of paying for this item separately
- Unnecessary or conflicting markings can be overlaid with asphalt

### Conclusion

Carry forward for further development

*Value Engineering Alternative Number 2- Remove pay item 652 paint striping entirely.*

### Advantages

- Typically all striping performed on 4-lane roadway is specified as thermoplastic.
- Temporary striping is paid by Section 150
- This striping is paid for under Section 150 in the contract.
- There is a cost saving for not re-striping as often

### Conclusion

Carry forward for further development

**E. BRIDGE DESIGN, VALUE ENGINEERING ALTERNATIVE NUMBER 1**

## **E. BRIDGE DESIGN**

*Value Engineering Alternative Number 1-Change the proposed three span bridge over CR 50 to a single span bridge with vertical abutments with MSE walls.*

### Advantages

- Significantly less construction time possibly more than six months
- Less construction cost
- Less future maintenance because of less bridge area

### Conclusion

Carry forward for further development

Insert 1

Insert 2

**E. BRIDGE DESIGN, VALUE ENGINEERING ALTERNATIVE NUMBER 1**

## **E. BRIDGE DESIGN**

*Value Engineering Alternative Number 2-Change the proposed three span bridge over the railroad to a single span bridge with vertical abutments with MSE walls.*

### Advantages

- Less future maintenance because of less bridge area
- Significantly less construction time possibly more than six months

### Conclusion

**Eliminate from further development since value engineering alternative no . 2 is shown to cost more.**

Insert 1

Insert 2

