VALUE ENGINEERING STUDY
OF
EDS-27(93) & MSL–0004-009266) (US 27)
PI NUMBER: 621610 & 0004266

ATLANTA, GEORGIA
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Prepared by:
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In Association With:

Georgia Department of Transportation

VALUE ENGINEERING STUDY
TEAM LEADER

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I. INTRODUCTION

GENERAL

This Value Engineering report summarizes the results of the Value Engineering study performed by Ventry Engineering for the Georgia Department of Transportation. The study was performed during the week of March 2, 2004.

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 the comparison of alternatives included the following:

- Future Maintenance Cost
- Construction Time
- Public Perception
- Construction Cost

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.

RECOMMENDATION NUMBER 1- CONSTRUCTABILITY
Cross Drain Structures

> The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative would insure that the condition of the existing cross drains warrants extending rather than replacement.

RECOMMENDATION NUMBER 2-CONSTRUCTABILITY
Earthwork

> The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative considers using in place embankment on the south project.

RECOMMENDATION NUMBER 3- STAGE CONSTRUCTION
Chattooga River Bridge

> The Value Engineering Team recommends that the Value Engineering Alternative Number 1 be implemented. This alternative uses full depth pavement for approaches during Stage 1 construction.

RECOMMENDATION NUMBER 4-STAGE CONSTRUCTION
Chattooga River Bridge

The Value Engineering Team recommends that the Value Engineering Alternative Number 2 be implemented. This alternative uses method number 4 for the temporary concrete barrier on the bridge.

RECOMMENDATION NUMBER 5- STAGE CONSTRUCTION
Adjacent Project

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative insures that the two adjacent projects can overlap during the final surfacing phase and that all traffic shifts occur on the binder and the last contractor place all topping material.

RECOMMENDATION NUMBER 6- MATERIALS
Pavement Section

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative changes the pavement section in the curb and gutter area to a full design and not the current under-designed section and extends at least 50M into the non-curb and gutter area to act as a buffer.

RECOMMENDATION NUMBER 7- OTHER

The Value Engineering Team also recommends that these Other Value Engineering Alternatives be implemented:

1. The construction detail for median crossovers (M-3) is not included with the plans.
2. Median crossovers should be Type "B" rather than Type "A".
3. A detail for the repair of sinkholes is included in the plans. On Project EDS-27(93), a specific location of a sinkhole is listed. This comment should be removed or a qualifier should be added to indicate that there could be additional sinkholes encountered in the project.
4. An error is contained in the Title Block of the traffic count sheets. The AM Design Hourly Volume should be for the Design Year of 2026 rather than 2006.
5. Timber type barricades are required where roads are cut off due to the new construction. The detail for these type barricades indicates an incorrect type of sheeting and should be revised. An alternate to using timber type barricades should be developed due to their high cost and the fact that there is no one assigned the responsibility for their maintenance.

II. LOCATION OF PROJECT

MAP

III. TEAM MEMBERS AND PROJECT DESCRIPTION

TEAM MEMBERS

NAME	AFFILIATION	EXPERTISE	PHONE
William F. Ventry	Ventry Engineering	Team Leader	850/627-3900
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PROJECT DESCRIPTION

Project EDS-27(93) begins on US 27 near CR 331 in the city of Trion in Chattooga County and extends northerly along US 27 to just north of SR 151 in Walker County. The typical sections are 5-lane urban, 5-lane rural, and 4-lane with 44 foot depressed, grassed median. Bridges on this project cross the Chattooga River.

Project MSL-0004-00(266) is a continuation of project EDS-27(93). It begins on US 27 just north of SR 151 and extends northerly along US 27 to just north of the LaFayette Bypass (US 1 Business). The typical sections are 4-lane rural with 44 depressed, grassed median, 5-lane rural, and 5-lane urban. Bridges on this project cross Cane Creek.

IV. INVESTIGATION PHASE

EDS-27(93) & MSL –0004-009266) (US 27)
VALUE ENGINEERING STUDY BRIEFING
MARCH 2, 2004

NAME	AFFILIATION	PHONE
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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. MATERIALS

V. SPECULATION PHASE

SPECULATION

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

A. CONSTRUCTABILITY

1. Cross Drain Structures
    - Insure that the condition of the existing cross drains warrants extending rather than replacement.
2. Earthwork
    - Consider using in place embankment on the south project

B. STAGE CONSTRUCTION

1. Chattooga River Bridge
    - Use full depth pavement for approaches during Stage 1 construction.
    - Use method number 4 for the temporary concrete barrier on the bridge.
2. Adjacent Project
    - Insure that the two adjacent projects can overlap during the final surfacing phase and that all traffic shifts occur on the binder and the last contractor place all topping material.

C. MATERIALS

1. Pavement Section
    - Change the pavement section in the curb and gutter area to a full design and not the current under-designed section and extend at least 50M into the non-curb and gutter area to act as a buffer.
2. Pavement Overlay
    - Consider eliminating the asphalt overbuild on the inside lane

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

1. Cross Drain Structures

Value Engineering Alternative - Insure that the condition of the existing cross drains warrants extending rather than replacement.

2. Earthwork

Value Engineering Alternative - Consider using in place embankment on the south project

B. STAGE CONSTRUCTION

1. Chattooga River Bridge

Value Engineering Alternative Number 1 - Use full depth pavement for approaches during Stage 1 construction.

Value Engineering Alternative Number 2 - Use method number 4 for the temporary concrete barrier on the bridge.

2. Adjacent Project

Value Engineering Alternative - Insure that the two adjacent projects can overlap during the final surfacing phase and that all traffic shifts occur on the binder and the last contractor place all topping material.

C. MATERIALS

1. Pavement Section

   Value Engineering Alternative - Change the pavement section in the curb and gutter area to a full design and not the current under-designed section and extend at least 50M into the non-curb and gutter area to act as a buffer.

2. Pavement Overlay

   Value Engineering Alternative - Consider eliminating the asphalt overbuild on the inside lane

VI.(B) ADVANTAGES AND DISADVANTAGES

EVALUATION/DEVELOPMENT

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

A. CONSTRUCTABILITY

1. Cross Drain Structures

US 27 is one of the older routes in the State of Georgia. The study project has numerous locations where the existing cross drains are proposed to be extended. A comprehensive survey needs to be conducted to assure that the existing pipes are in condition to be extended. With the age of these structures and the fact that some of them are corrugated metal, they may not be suitable for extensions. After their condition has been determined and if they cannot be extended, decisions can be made as to the proper replacement, i.e. open cut replacement, jack & bore, reline, etc.

Value Engineering Alternative - Insure that the condition of the existing cross drains warrants extending rather than replacement.

Advantages

- May be less future maintenance
- May avoid change orders during construction
- Longer service life if replaced

Disadvantages

- Higher construction cost

Conclusion

Carry forward for further evaluation

A. CONSTRUCTABILITY

2. Earthwork

The two study projects are proposed to contain two pay items for the grading of the projects. The southern-most project (EDS-27(93)) is proposed to have approximately 220,400 CM of unclassified excavation and approximately 29,800 CM of borrow excavation. The northern-most project (MSL-0004-00(266)) has only the one item of unclassified. The quantity on this section is over 1,100,000 CM of unclassified. The project earthwork computations indicate a waste quantity on this project of almost 500,000 CM after the shrinkage factor is applied. With the fact that these projects are adjacent to each other and the tremendous disparity in the earthwork needs between the two, it is recommended that the items of unclassified and borrow in project EDS – 27(93) be changed to the one item of in-place embankment. This item would be much simpler for GADOT's management of the project and would allow more versatility for the contractor to better stage construction were one contractor to be awarded both projects.

The excessive amount of waste generated by the northern most project (MSL-0004-0(266)), should be used to the advantage of the Department of Transportation. There are several relatively shallow fills that are shown in the cross sections as being on a 2:1 slope. Wherever possible these slopes should be flattened to 4:1. These flatter slopes would eliminate some of the waste material, eliminate the need for guardrail, reduce roadway maintenance, and enhance the operational characteristics of the road.

Value Engineering Alternative - Consider using in place embankment on the south project

Advantages

- Easier to measure
- Does not require control of borrow pit by GADOT

Disadvantages

- None apparent

Conclusion

Carry forward for further evaluation

B. STAGE CONSTRUCTION

1. Chattooga River Bridge

The new bridge over the Chattooga River will have to be constructed in two different stages. The first stage of 8.75m will be constructed to the right of centerline with two lanes of traffic placed on this stage upon its completion. The northbound travel lane will be near the bridge rail and will be using the future shoulder on the south approach and the north exit sides of the bridge. This area will be a mainline travel section for several months and a special detail needs to be included in the plans to address the fact that full depth base and paving is to be used in this shoulder area.

Value Engineering Alternative Number 1 - Use full depth pavement for approaches during Stage 1 construction.

Advantages

- Reduces future maintenance
- Easier construction

Disadvantages

- Higher construction cost

Conclusion

Carry forward for further evaluation

Value Engineering Alternative Number 2

The phasing will require that temporary concrete median barrier be placed on the left edge of the completed Phase I construction. This barrier is shown as Method 3 on the summary of bridge quantities. New Federal Highway Administration requirements are for temporary barrier in this application be Method 4. Their concern is that if the temporary concrete median barrier is struck, it will be pushed over the edge and traffic will have no protection from the object that is being bridged. Therefore, it is recommended that the plans be changed to reflect this requirement.

Value Engineering Alternative Number 2 - Use method number 4 for the temporary concrete barrier on the bridge.

Advantages

- Meets FHWA requirement
- Restrains concrete barrier

Disadvantages

- May not have connection that meets requirements

Conclusion

Carry forward for further evaluation

B. STAGE CONSTRUCTION

2. Adjacent Project

Project EDS-27(93) is scheduled to be let to contract in June 2004 and Project MSL-0004-00(266) is scheduled to be let to contract in July 2004. The anticipation is that the projects will be completed at approximately the same time. The project plans need to address the potential that one project will be completed for some length of time before the other. The first project to be completed should have a requirement that since the other project is not complete, any temporary pavement markings required will be placed on binder and not on a final riding course of asphalt. The other project will then, in its completion of work, place the riding surface, associated pavement markings and remove/install appropriate signage on the adjacent project.

Value Engineering Alternative - Insure that the two adjacent projects can overlap during the final surfacing phase and that all traffic shifts occur on the binder and the last contractor place all topping material.

Advantages

- Minimizes potential for claims
- Less construction cost
- Good public relations

Disadvantages

- None apparent

Conclusion

Carry forward for further evaluation

C. MATERIALS

1. Pavement Section

Projects EDS-27(93) and MSL-0004-00(266) each contain urban sections with curb & gutter on the edges. The flexible pavement design analysis has an under design of from 11% to 19%. This under design allows for future overlays to bring the pavement structure up to the design requirements. The Department of Transportation's latest effort is to not resurface above the lip of the gutter in a curb & gutter section, rather these sections are to be milled and inlaid. This not only maintains proper drainage, but also eliminates any adverse impacts to handicapped ramps. The areas of curb & gutter would always have an under designed pavement structure. Therefore, it is recommended that in curb & gutter sections, the typical section should be revised to add either additional base or paving to meet the future design requirements. This additional thickness needs to extend about 50m beyond the limits of curb & gutter so that future milling can transition into the urban section without reducing any required design thickness.

Value Engineering Alternative - Change the pavement section in the curb and gutter area to a full design and not the current under-designed section and extend at least 50M into the non-curb and gutter area to act as a buffer.

Advantages

- Less future maintenance
- Allows for future milling and overlaying
- Curb and gutter would not have to be filled in
- Could easily meet ADA requirements on future milling and overlay projects

Disadvantages

- Higher construction cost

Conclusion

Carry forward for further evaluation

C. MATERIALS

2. Pavement Overlay

Value Engineering Alternative - Consider eliminating the asphalt overbuild on the inside lane

Advantages

- Less asphalt cost
- Less earthwork on shoulder
- Less construction time

Disadvantages

- Perception of inside lane slopped toward median
- Cost savings not great enough to revise plans at this point

Conclusion

DROP FROM FURTHER CONSIDERATION