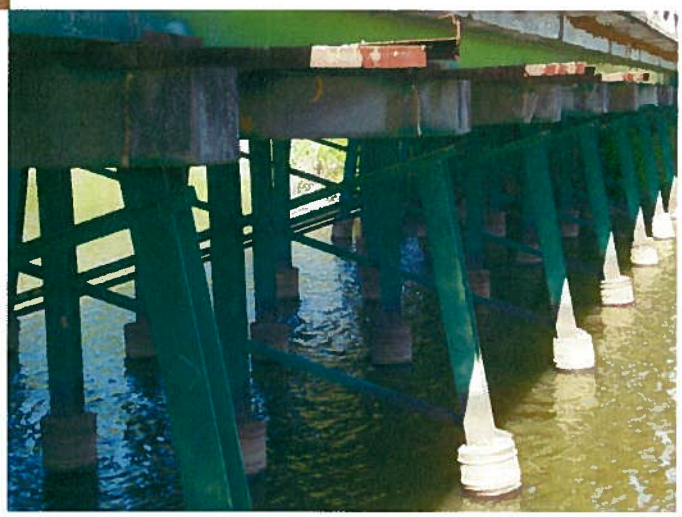
Value Engineering Study Report

EDS-545(40), BRN-014-1(73)(74) McDuffie County
P.I. Nos.: 222250, 227815, 227816
SR 17 from SR 43 to West of SR 6



Preserve Roadway - Integrity – Serviceability – Safety

Value Management Team:

PBSJ

Design Team:
STANTEC

May 4, 2007

May 4, 2007

Ms. Lisa Myers
Design Review Engineer Manager
Georgia Department of Transportation
#2 Capitol Square, Room 266
Atlanta, GA 30334

RE: Submittal of the final Value Engineering Report
EDS-545(40), BRN-014-1(73) (74), McDuffie County
P.I. Nos.: 222250, 227815, 227816
SR 17 from SR 43 to West of SR 6
PBS&J Project Task Order No. 9

Dear Ms. Myers:

Please find enclosed four (4) hard copies and a CD of our final Value Engineering Report for the SR 17 from SR 43 to West of SR 6, McDuffie, County, as referenced above.

This Value Engineering Study, which was performed during the period April 16 through April 19, 2007, identified ***27 Alternative Ideas*** of which ***9*** **are recommended for implementation**. The VE Team also identified 5 ***Design Suggestion Ideas*** which are recommended for the Engineer to consider in his final design. We believe that the **9 Alternative Ideas** recommended may have a significant positive affect on the project.

We trust that you will find this report to be in proper order. It should be noted that the results of this workshop are volatile in that they can be overcome by the events that accompany the expeditious continuance of the design process. Accordingly, we encourage an equally expeditious implementation meeting to design the disposition of the contents of this report.

On behalf of our VE Team, we thank you very much for this opportunity to work with you and the hard working staff of the Georgia Department of Transportation.

Yours truly,
PBS&J

Les M. Thomas

Les M. Thomas, P.E., CVS-Life
VE Team Leader

Value Engineering Study Report

EDS-545(40), BRN-014-1(73)(74) McDuffie County
P.I. Nos.: 222250, 227815, 227816
SR 17 from SR 43 to West of SR 6

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Executive Summary

Executive Summary

INTRODUCTION

This report summarizes the analysis and conclusions by the PBS&J Value Engineering workshop team as they performed a VE Study during the period of April 16 through 19, 2007 in Atlanta, Georgia for the Georgia Department of Transportation. The subject of the Value Engineering study was Project – EDS-545(40), BRN-014-1(73)(74) McDuffie County, P.I. Nos.: 222250; 227815, 227816; SR 17 from SR 43 to West of SR 6. The design is being performed by STANTEC. This project consists of the widening of the existing SR 17 from SR 43 to West of SR 6 (approximately 6.7 miles) in McDuffie County. The project will also replace two bridges, one over Big Creek and one over Hart Creek.

More information about this project may be found in the tabbed section of this report entitled ***Project Description***.

VALUE ENGINEERING PROCESS

The Value Engineering Team followed the Seven Step Value Engineering job plan as promulgated by Georgia Department of Transportation. This Seven Step Job Plan includes the following:

- Investigation
- Analysis
- Speculation
- Evaluation
- Development
- Recommendation
- Presentation

This report is a component of the Presentation Phase. As part of the VE workshop in Atlanta, the team made an informal presentation of their results on the last morning of the workshop. This report is intended to formalize the workshop results and set the stage for a formal implementation meeting in which alternatives and design suggestions will typically be accepted, accepted with modifications, or rejected for cause. The worksheet that follows, along with the formally developed alternatives and design suggestions can be used as a "score sheet" for the implementation meeting. It is also included in this report to identify, on a summary basis, the results of the workshop. The reader is encouraged to visit the third tabbed section of this report entitled ***Study Results*** for a review of the details of the developed alternatives. The tabbed section ***Project Description*** includes information about the project itself and the tabbed section ***Value Engineering Process*** presents the detail process of the Value Engineering Study.

THE STUDY RESULTS

During the speculation phase the VE Team identified ***27 Alternative Ideas*** that appeared to hold potential for reducing the construction cost, improving the end product and/or reducing the difficulty and time of project construction.

After the evaluation phase was completed, **9** ***Alternative Ideas*** and 5 **Design Suggestions** remained for further consideration. These Alternative Ideas and Design Suggestions may be found, in their documented form, in the section of this report entitled ***Study Results***. The following ***Summary of Alternatives and Design Suggestions*** coupled with the documentation of the developed alternatives should provide the reader with the information required to fully evaluate the merits of each of the alternatives.

SUMMARY OF ALTERNATIVES AND DESIGN SUGGESTIONS

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDUFFIE COUNTY

P.I. No.: 222250, 227815,227816

SR 17 FROM SR 43 TO WEST OF SR 6

Alternative Number	DESCRIPTION OF ALTERNATIVE	Initial Cost Savings	Implemented Cost Savings/Disposition	Final Disposition
	ROADWAY (R)			
R-1	Re-evaluate existing pavement analysis from Sta. 0+00 to Sta. 186+83; and if possible, utilize the existing pavement and profile as is; upgrade existing for "structure" and or "surface course" as needed	$2,351,141		
R-7	Retain Existing CR 6/ Smith Mill Rd. existing alignment	$63,328		
R-11	Retain existing CR 301 (Ridge Road)/ CR 5 (Russell's Landing Road) alignment	$656,559		
R-14	Delete type 7 curb and gutter at intersections	ABD		
R-15	Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb	DS		
R-16	Review cost estimate for bridge removal cost (appears very low), and the quantity of rip rap being called for – appears high	DS		
	BIG CREEK BRIDGE (BCB)			
BCB-3	Construct one new total width bridge in lieu of two new bridges	$535,942		
BCB-4	Use "H" in lieu of drilled caissons	$307,596		
BCB-5	Use a 32' bridge width design (gutter to gutter)	$416,609		
	HART CREEK BRIDGE (HCB)			
HCB-1	Construct one new total width bridge in lieu of two new bridges	$311,598		
HCB-2	Use steel "H" piles in lieu of drilled caissons	$307,596		
HCB-3	Use 32' bridge width design (gutter to gutter)	$125,741		

SUMMARY OF ALTERNATIVES AND DESIGN SUGGESTIONS

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County

P.I. No.: 222250, 227815,227816

SR 17 from SR 43 to West of SR 6

Alternative Number	DESCRIPTION OF ALTERNATIVE	Initial Cost Savings	Implemented Cost Savings/Disposition	Final Disposition
	DRAINAGE (D)			
D-1	Consider jack and bore in-lieu of "open cut" for Stage I construction	DS		
D-3	Consider using pipes in-lieu of box culverts to save open-cut	DS		
D-4	Review and modify the construction documents and or staging plan as need be, to transport stormwater runoff from new southbound lanes to an outfall on east side of northbound lanes. May need to consider routing runoff north or south in median to be able to cross northbound lanes.	DS		

Study Results

Study Results

Introduction

This section includes the study results presented in the form of fully developed value engineering alternatives that include descriptions of the original design, description of the alternative design configurations, comments on the technical justifications, opportunities and risks associated with the alternatives, sketches, calculations and technical justification for these alternatives. For the most part, these fully developed alternatives represent an array of choices that clearly could have an impact on the eventual cost and performance of the finished project.

The documented alternatives also include Design Suggestions (DS). As their name implies, these are short write-ups making note of VE perspectives on technical issues and sharing some thoughts for consideration as the design moves forward.

This introductory sheet is followed by a *Summary of Alternatives & Design Suggestions* table. It should be noted that the alternatives that are included, which have cost estimates attached are not necessarily representative of the final cost outcome for each alternative. Some of these alternatives have components that are mutually exclusive so they may not be added together.

The users of this report are asked to consider these alternatives and design suggestions as a smorgasbord of choices for selection and use as the project moves forward. The following *Summary of Alternatives & Design Suggestions* may also be used as a "score sheet" within the bounds of an implementation meeting.

Cost Calculations

The cost calculations are intended only as a guide to the approximate results that might be expected from implementation of the alternatives. They should be helpful in making clear choices as to the pursuit of individual alternatives.

A composite mark-up of 10% for the construction cost comparisons was derived from the cost estimate for the project. This estimate can be found in the section of this report entitled ***Project Description.***

SUMMARY OF ALTERNATIVES AND DESIGN SUGGESTIONS

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDUFFIE COUNTY

P.I. No.: 222250, 227815,227816

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R-11	Retain existing CR 301 (Ridge Road)/ CR 5 (Russell's Landing Road) alignment	$656,559		
R-14	Delete type 7 curb and gutter at intersections	ABD		
R-15	Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb	DS		
R-16	Review cost estimate for bridge removal cost (appears very low), and the quantity of rip rap being called for – appears high	DS		
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SUMMARY OF ALTERNATIVES AND DESIGN SUGGESTIONS

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County

P.I. No.: 222250, 227815,227816

SR 17 from SR 43 to West of SR 6

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	DRAINAGE (D)			
D-1	Consider jack and bore in-lieu of "open cut" for Stage I construction	DS		
D-3	Consider using pipes in-lieu of box culverts to save open-cut	DS		
D-4	Review and modify the construction documents and or staging plan as need be, to transport stormwater runoff from new southbound lanes to an outfall on east side of northbound lands. May need to consider routing runoff north or south in median to be able to cross northbound lanes.	DS		

Value Analysis Design Alternative

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTAION EDS-545(40), BRN-014-1(73)(74) MCDUFFIE COUNTY - P.I. NO.: 222250, 227815, 227816, SR 17 FROM SR 43 TO WEST OF SR 6**

ALTERNATIVE NO.: **R-1**

DESCRIPTION: **RE-EVALUATE EXISTING PAVEMENT ANALYSIS AND IF APPROPRIATE, UTILIZE THE EXISTING PAVEMENT AND PROFILE AS IS, UPGRADE PAVEMENT TO MEET STRUCTURE OR SURFACING REQUIREMENTS.**

Original Design:

The original design, based on a pavement testing and analysis, calls for the complete removal and replacement of all existing pavement.

Alternative Design:

This alternative design is based upon staff comments and field observations which suggest that the existing pavement may have a longer life expectancy than originally thought. Accordingly, it is suggested that the analysis be reviewed and if appropriate, utilize either all or significant portions of the existing roadway.

Opportunities:

- Cost savings
- Reduced construction time

Risks:

- Variable pavement section overlay versus full depth may result in different life expectations
- Minor variations in edge of pavement grades for northbound and southbound lanes

Technical Discussion:

The existing roadway corresponds with the new northbound lanes between Sta. 10+73 and Sta. 186+183. The section will be overlaid with 2" of 19mm Superpave and 1 ½" of 12.5mm Superpave. Section 149, construction layout, would be utilized to modify the grades of the new northbound lanes to obtain the proper cross slope and acceptable profile.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 11,683,828	$ 0	$ 11,683,828
ALTERNATIVE	$ 9,332,687	$ 0	$ 9,332,687
SAVINGS	$ 2,351,141	$ 0	$ 2,351,141

Illustrations

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTAION EDS-545(40), BRN-014-1(73)(74) McDUFFIE COUNTY - P.I. No.: 222250, 227815, 227816, SR 17 FROM SR 43 TO WEST OF SR 6**

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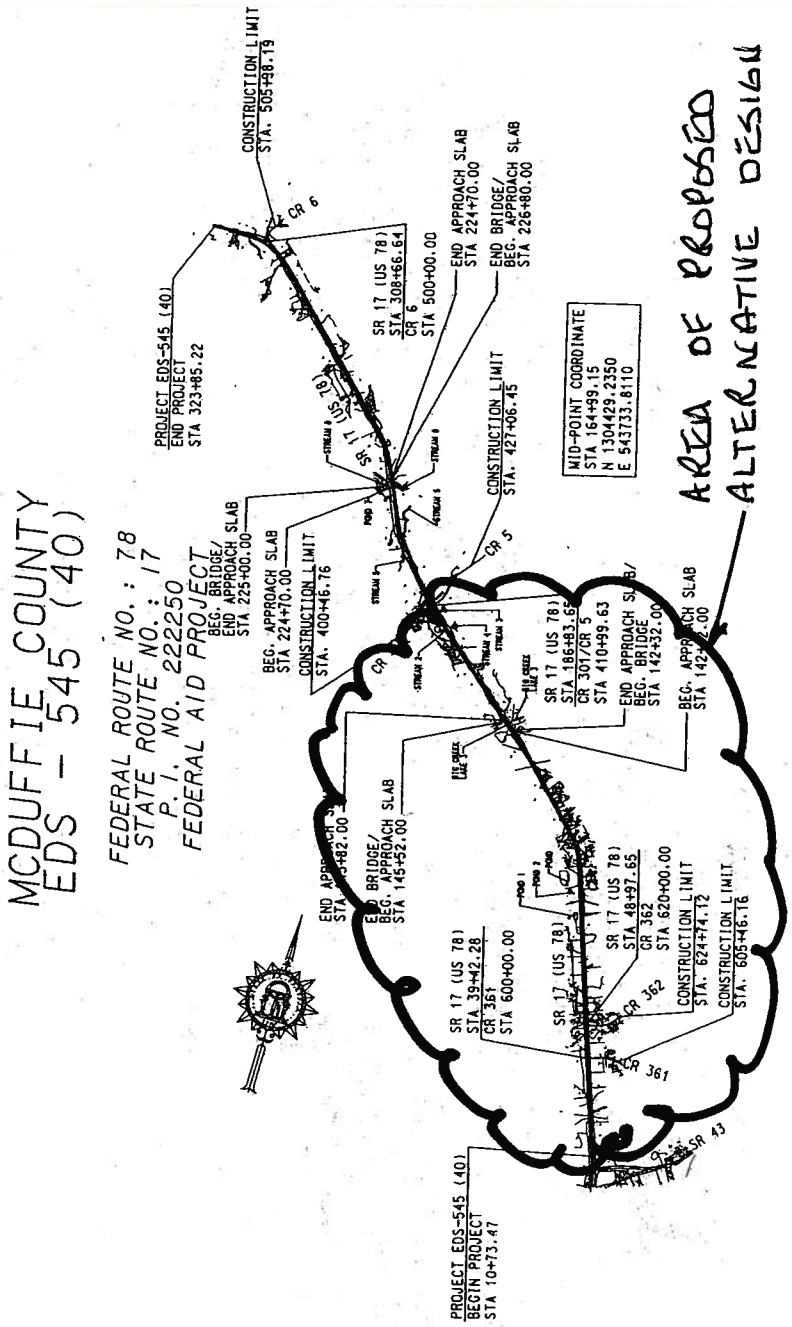
SHEET NO.: 2 of 5



Illustrations

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTAION EDS-545(40), BRN-014-1(73)(74) MCDUFFIE COUNTY - P.I. NO.: 222250, 227815, 227816, SR 17 FROM SR 43 TO WEST OF SR 6**

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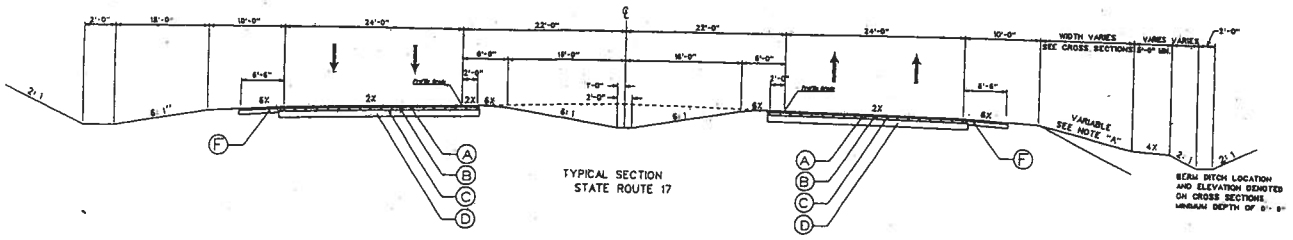
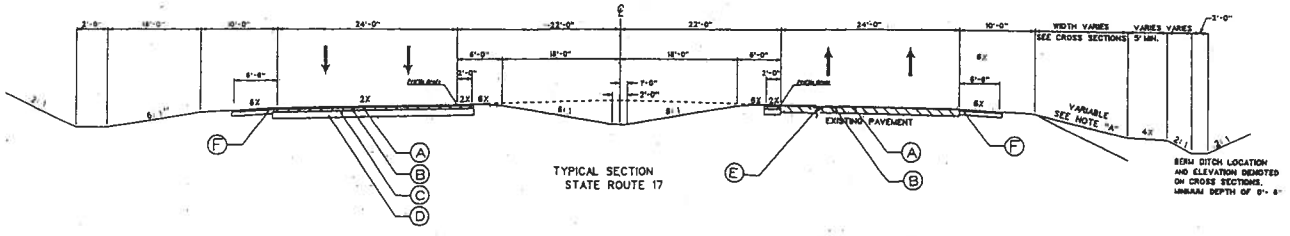
SHEET NO.: 3 of 5



ORIGINAL DESIGN

REQUIRED PAVEMENT
- (A) ASPHALTIC CONCRETE 12.5 mm SUPERPAVE - 165 LBS/SY
- (B) ASPHALTIC CONCRETE 19 mm SUPERPAVE - 220 LBS/SY
- (C) ASPHALTIC CONCRETE 25 mm SUPERPAVE - 880 LBS/SY
- (D) GRADED AGGREGATE BASE - 12 INCHES
- (E) ASPHALTIC CONCRETE LEVELING, AS REQ'D
- (F) 2 FT INDENTATION RUMBLE STRIP



ALTERNATIVE DESIGN

Calculations

PBS&J

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTAION EDS-545(40), BRN-014-1(73)(74) McDUFFIE COUNTY - P.I. No.: 222250, 227815, 227816, SR 17 FROM SR 43 TO WEST OF SR 6**

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STA 10+73 – STA 186+83

BRIDGE & APPROACHES - STA 140+50 - STA 150+00
THE BRIDGE AREA WILL BE NEW FULL DEPTH CONSTRUCTION

STA 10+73 - STA 140+50	12977 LF
STA 150+00 - STA 186+83	3683 LF
TOTAL	166660 LF

TYPICAL SECTION - 24' WIDTH
25mm SUPERPAVE 880 #/YD²
GAB 12" DEPTH

25 mm SUPERPAVE

166660 LF x 24 FT ÷ 9 x 880 #/YD² ÷ 2000 = 19547 TN

GAB

166660 LF x 24 FT x 1 FT x 145 #/FT³ ÷ 2000 = 28988 TN

UNCLASSIFIED EXCAVATION (ASSUME 8" REMOVAL)

166660 LF x 24 FT x 0.67 FT ÷ 27 = 9921 CU YD

COST WORKSHEET

PBS&J

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6**	ALTERNATIVE NO: R-1	SHEET NO: 5 OF 5
DESCRIPTION:	DESCRIPTION: **RE-EVALUATE EXISTING PAVEMENT ANALYSIS AND IF APPROPRIATE, UTILIZE THE EXISTING PAVEMENT AND PROFILE AS IS, UPGRADE PAVEMENT TO MEET STRUCTURE OR SURFACING REQUIREMENTS.**	

	CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
	ITEM	UNITS	NO. OF UNITS	COST/UNIT	TOTAL	NO. OF UNITS	COST/UNIT	TOTAL
	205-0001 UNCLASS EXCAV	CY	281900	6.98	1967662	271979	6.98	1898413
*	310-1101 GR A66R BASE CRS	TN	130000	17.40	2262000	101012	17.40	1757608
	402-3121 RECYCLED ASPH CONC 25mm	TN	79900	$0.00	6392000	60353	$0.00	4828240
	SUB-TOTAL				10621662			8484261
	MARK-UP AT				1062166			848426
	TOTAL				11683828			9332687

* QUANTITY SHOWN IN COST ESTIMATE IS INACCURATE. CALCULATION OF GAB BASED ON TYPICAL SECTIONS INDICATE 130 000 TN IS A CLOSER ESTIMATE.

Value Analysis Design Alternative

GEORGIA DEPARTMENT OF TRANSPORTATION

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-7**

DESCRIPTION: **RETAIN EXISTING C.R. 6/SMITH MILL ROAD ALIGNMENT**

Original Design:

The original design realigns C.R. 6/Smith Mill Road to improve the horizontal alignment and provide for a perpendicular intersection with S.R. 17.

Alternative Design:

This alternative design suggests retaining the existing C.R. 6/Smith Mill Road alignment and reconstructing only as necessary to tie in with the proposed profile grade of S.R. 17.

Opportunities:

- Cost Savings – Required R/W
- Cost Savings – Paving Items & Earthwork
- Minimize Impacts to Property Owners

Risks:

- Minimal redesign
- Intersection Skew Angle Less Than 90°

Technical Discussion:

The alternative reduces cost by minimizing required improvements to a low volume side road. The proposed improvements to the horizontal alignment of C.R. 6/Smith Mill Road are excessive and only a minimum length tie-in is required to provide access to proposed S.R. 17. The proposed S.R. 17 roadway profile indicates that the existing C.R. 6/Smith Road tie-in is approximately the same elevation as the mainline. Therefore, it is recommended that the C.R. 6/Smith Mill Road tie-in be maintained on existing alignment and paved only to the limits of the S.R. 17 right-of-way. An analysis of the S.R. 17 profile indicates that this solution will provide adequate intersection sight distance will be provided per AASHTO requirements.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 75,657	$ 0	$ 75,657
ALTERNATIVE	$ 12,329	$ 0	$ 12,329
SAVINGS	$ 63,328	$ 0	$ 63,328

Illustrations

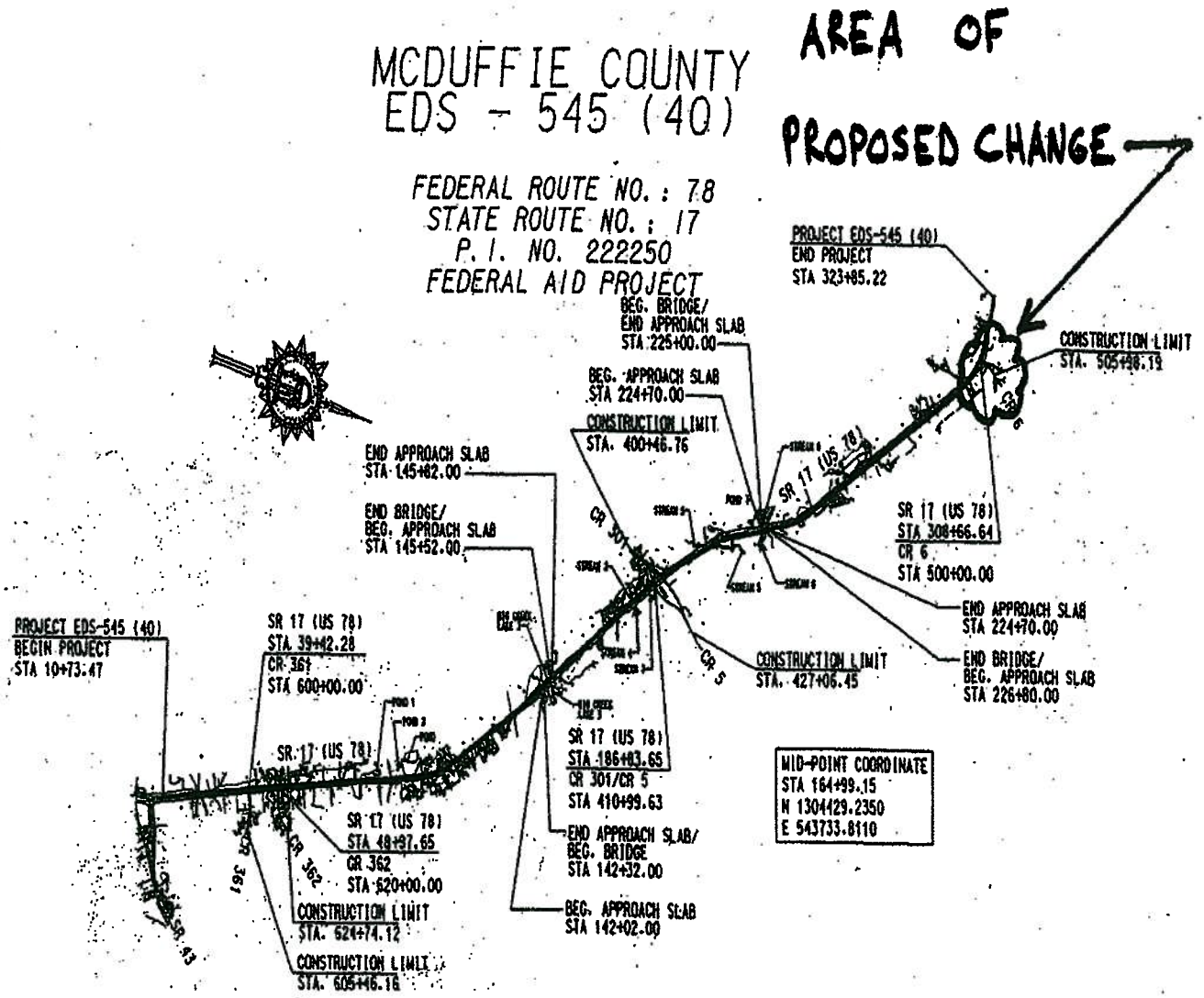
GEORGIA DEPARTMENT OF TRANSPORTATION

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

DESCRIPTION: **RETAIN EXISTING C.R. 6/SMITH MILL ROAD ALIGNMENT**

ALTERNATIVE NO.: R-7

SHEET NO.: 2 of 5



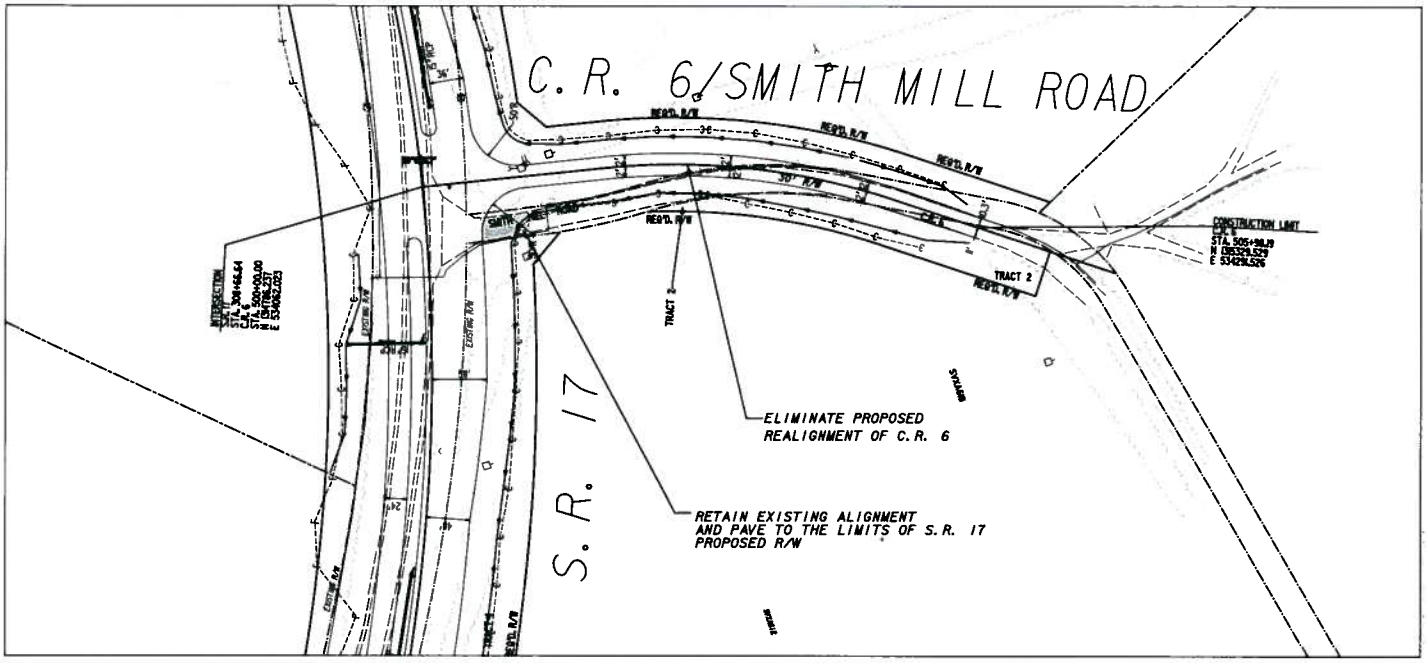
Illustrations

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-7**

DESCRIPTION: **RETAIN EXISTING C.R. 6/SMITH MILL ROAD ALIGNMENT**

SHEET NO.: 3 of 5



Calculations

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-7**

DESCRIPTION: RETAIN EXISTING C.R. 6/SMITH MILL ROAD ALIGNMENT

SHEET NO.: 4 of 5

Original

12.5 MM SUPERPAVE → 1,560 SY X 165 #/SY X 1 TN/2000 # = 129 TN

19 MM SUPERPAVE → 1,560 SY X 220 #/SY X 1 TN/2000 # = 172 TN

25 MM SUPERPAVE → 1,560 SY X 440 #/SY X 1 TN/2000 # = 344 TN

10" G.A.B. → 1,560 SY X 1100 #/SY X 1 TN/2000 # = 858 TN

Required R/W = 1.0 acres

Alternative

12.5 MM SUPERPAVE → 260 SY X 165 #/SY X 1 TN/2000 # = 22 TN

19 MM SUPERPAVE → 260 SY X 220 #/SY X 1 TN/2000 # = 29 TN

25 MM SUPERPAVE → 260 SY X 440 #/SY X 1 TN/2000 # = 58 TN

10" G.A.B. → 260 SY X 1100 #/SY X 1 TN/2000 # = 143 TN

Required R/W = 0 acres

COST WORKSHEET

PBSJ

PROJECT:	EDS-545(40), BRN-014-1(73)(74) McDuffie County	ALTERNATIVE NO.:	R-7
	P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6		
DESCRIPTION:	RETAIN EXISTING C.R. 6/SMITH MILL ROAD ALIGNMENT	SHEET NO.:	_5_ of _5_

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
G.A.B.	TN	858	17.40	14,929.20	143.00	17.40	2,488.20
12.5 MM SUPERPAVE	TN	129	80.00	10,320.00	22.00	80.00	1,760.00
19 MM SUPERPAVE	TN	172	80.00	13,760.00	29.00	80.00	2,320.00
25 MM SUPERPAVE	TN	344	80.00	27,520.00	58.00	80.00	4,640.00
REQUIRED R/W	AC	1	2,250.00	2,250.00	0.00	2,250.00	0.00
Sub-total				68,779.20			11,208.20
Mark-up at 10.00%				6,877.92			1,120.82
TOTAL				75,657.12			12,329.02

63,328.10

Value Analysis Design Alternative

GEORGIA DEPARTMENT OF TRANSPORTATION

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-11**

DESCRIPTION: **RETAIN EXISTING C.R. 301 (RIDGE ROAD)/C.R.5 (RUSSELL'S LANDING ROAD) ALIGNMENT**

Original Design:

The original design realigns C.R. 301 (Ridge Road) and C.R. 5 (Russell's Landing Road) to improve the horizontal alignments and provide for a perpendicular intersection with S.R. 17.

Alternative Design:

This alternative design suggests retaining the existing alignments for C.R. 301 (Ridge Road) and C.R. 5(Russell's Landing Road) and reconstructing both side roads only as necessary to tie in with the proposed profile grade of S.R. 17.

Opportunities:

- Cost Savings – Required R/W
- Cost Savings – Paving Items & Earthwork
- Minimize Impacts to Property Owners

Risks:

- Minimal redesign
- Intersection Skew Angle Less Than 90°

Technical Discussion:

The alternative reduces cost by minimizing required improvements to low volume side roads. The proposed improvements to the horizontal alignment of C.R. 301 (Ridge Road) and C.R. 5 (Russell's Landing Road) are excessive and only minimum length tie-ins are required to provide access from the side roads to proposed S.R. 17. The S.R. 17 roadway profile indicates that the existing C.R. 301 (Ridge Road)/C.R. 5 (Russell's Landing Road) tie-in is approximately one (1) foot lower than the mainline. Therefore, it is recommended that the tie-ins for C.R. 301 (Ridge Road) and C.R. 5 (Russell's Landing Road) be maintained on existing alignment and paved only to the limits of the S.R. 17 right-of-way. An analysis of the S.R. 17 profile indicates that this solution will provide adequate intersection sight distance per AASHTO requirements.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 695,365	$ 0	$ 695,365
ALTERNATIVE	$ 38,806	$ 0	$ 38,806
SAVINGS	$ 656,559	$ 0	$ 656,559

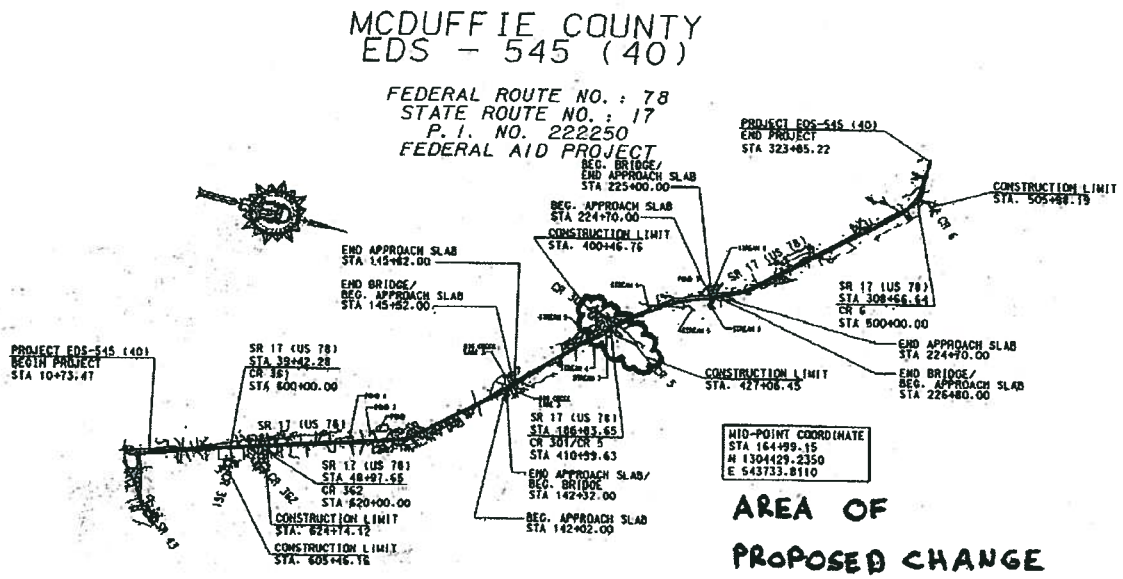
Illustrations

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: R-11

DESCRIPTION: **RETAIN EXISTING C.R. 301 (RIDGE ROAD)/C.R.5 (RUSSELL'S LANDING ROAD) ALIGNMENT**

SHEET NO.: 2 of 5



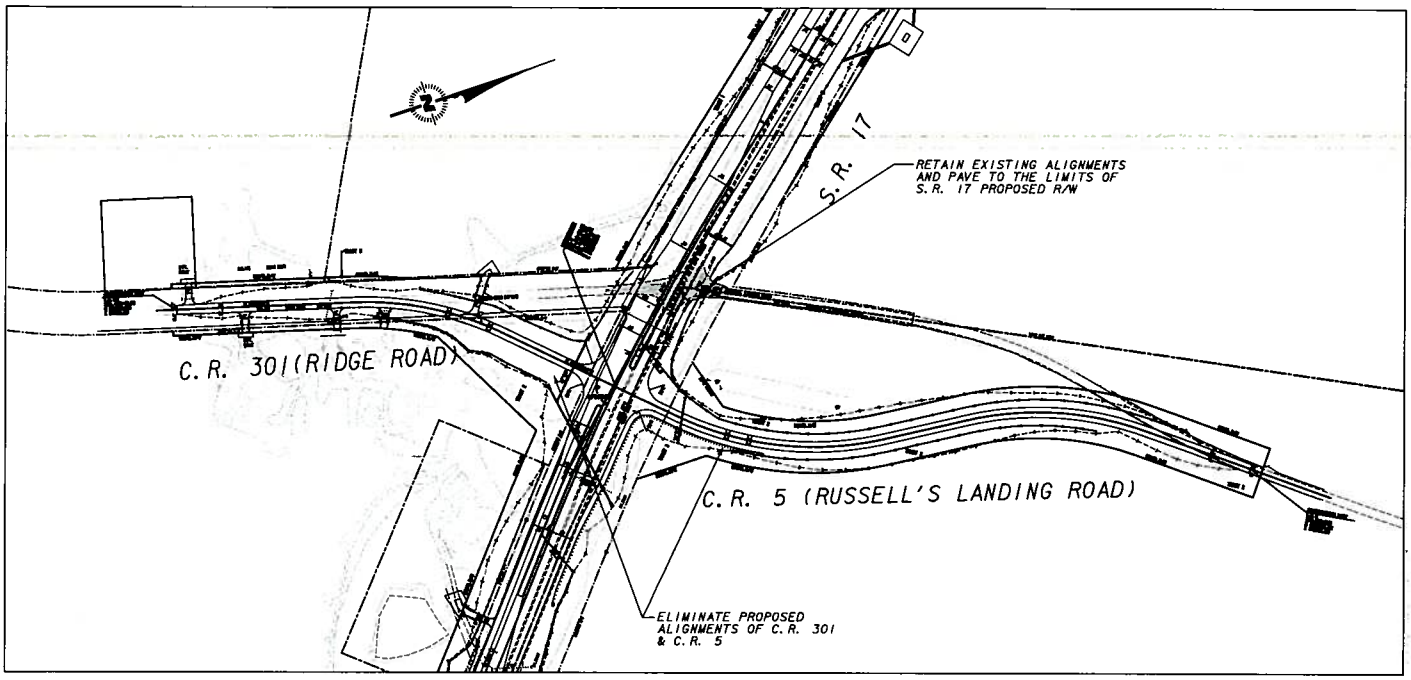
Illustrations

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: R-11

DESCRIPTION: **RETAIN EXISTING C.R. 301 (RIDGE ROAD)/C.R.5 (RUSSELL'S LANDING ROAD) ALIGNMENT**

SHEET NO.: 3 of 5



Original

12.5 MM SUPERPAVE → 6,700 SY X 165 #/SY X 1 TN/2000 # = 553 TN

19 MM SUPERPAVE → 6,700 SY X 220 #/SY X 1 TN/2000 # = 737 TN

25 MM SUPERPAVE → 6,700 SY X 440 #/SY X 1 TN/2000 # = 1,474 TN

10" G.A.B. → 6,700 SY X 1100 #/SY X 1 TN/2000 # = 3,685 TN

UNCLASS EXCAV = 39,500 CY (*Caice Earthwork Report*)

BORROW EXCAV, INCL MATL = 9,056 (*Caice Earthwork Report*)

REQUIRED R/W = 5.0 acres

Alternative

12.5 MM SUPERPAVE → 260 SY X 165 #/SY X 1 TN/2000 # = 22 TN

19 MM SUPERPAVE → 260 SY X 220 #/SY X 1 TN/2000 # = 29 TN

25 MM SUPERPAVE → 260 SY X 440 #/SY X 1 TN/2000 # = 58 TN

10" G.A.B. → 260 SY X 1100 #/SY X 1 TN/2000 # = 143 TN

UNCLASS EXCAV = 2,500 CY

BORROW EXCAV, INCL MATL = 1,000 CY

REQUIRED R/W = 0 acres

COST WORKSHEET

PBS&J

PROJECT:	EDS-545(40), BRN-014-1(73)(74) McDuffie County	ALTERNATIVE NO.:	R-11
	P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6		
DESCRIPTION:	RETAIN EXISTING C.R. 301 (RIDGE ROAD)/	SHEET NO.:	5 of 5
	C.R.5(RUSSELL'S LANDING ROAD) ALIGNMENT		

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
UNCLASS EXCAV	CY	39,500	7	275,710	2500	6.98	17,450
BORROW EXCAV	CY	9,056	7	59,951	1000	6.62	6,620
G.A.B.	TN	3,685	17	64,119	143	17.40	2,488
12.5 MM SUPERPAVE	TN	553	80	44,240	22	80.00	1,760
19 MM SUPERPAVE	TN	737	80	58,960	29	80.00	2,320
25 MM SUPERPAVE	TN	1474	80	117,920	58	80.00	4,640
REQUIRED R/W	AC	5	2,250	11,250	0	2,250.00	0
Sub-total				632,150			35,278
Mark-up at 10.00%				63,215			3,528
TOTAL				695,365			38,806

656,559

Value Analysis Design Suggestion

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-15**

DESCRIPTION: Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb

Original Design: Provides a full depth Roadway section of 21 ½" and a reduced section for shoulder paving in guardrail locations, the shoulder will be widened to accommodate the guardrail installation. Asphalt pavement will be installed for 2 ½' outside the paved shoulder beneath the guardrail per cost detail.

Alternative: Will specify the subgrade to be constructed to the same template for the pavement section and shoulder section. Shoulder pavement would remain the same as original design with the additional depth being constructed of aggregate base. The shoulder pavement would be reduced by 1 ½' with V-gutter being utilized to accomplish the same shoulder width. Guardrail would be installed so the face of rail would align with the V-gutter low point. Asphalt pavement or bituminous surface treatment would be installed beneath the guardrail.

Opportunities:

- Simplified grading operation for pavement and shoulder subgrade
- Reduced shoulder width
- Better shoulder construction

Risks:

- Design variance
- Additional gaps

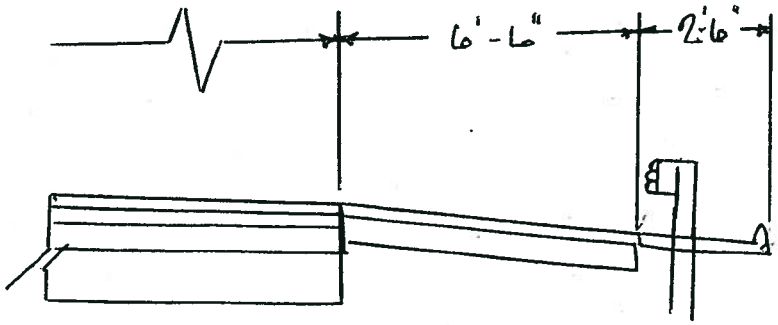
Illustrations

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

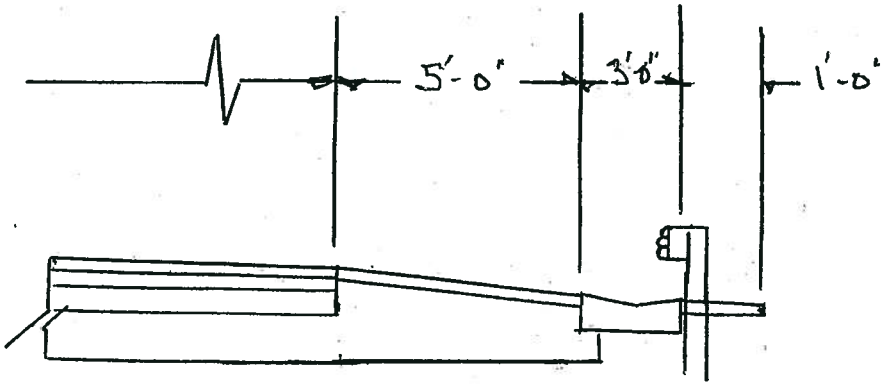
ALTERNATIVE NO.: R-15 (DS)

DESCRIPTION: Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb

SHEET NO.: 2 of 2



ORIGINAL DESIGN



ALTERNATE DESIGN

Value Analysis Design Suggestion

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **R-16**

DESCRIPTION: Review cost estimate for bridge removal cost (appears very low), and the quantity of rip rap being called for – appears high

SHEET NO.: 1 of 1

Original Design:

Cost estimate specifies 28,000 SY of rip rap and 28,000 SY of filter fabric at a cost of $1,638,280.00. Construction plans and Erosion control plans specify less than 1,000 SY of rip rap and filter fabric.

Alternative:

Place locations of required rip rap on plans, summary of quantities, and detailed estimate.

Opportunities:

- Cost savings
- Clarification of construction requirements

Risks:

-

Value Analysis Design Alternative

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB-3

DESCRIPTION: **BIG CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 1 of 5

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 7-span bridges, 320' long with Spans 1, 2, 3, 5, 6 & 7 at 40' and Span 4 at 80', over Big Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). Spans 1, 2, 3, 5, 6 & 7 are comprised of six GDOT Tee Beam Decks. Span 4 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. Bents 1, 2, 3, 6, 7 & 8 are made up of concrete caps supported on Steel "H" Piles while Bents 4 & 5 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:
The proposed alternative routes the Northbound and Southbound lanes through a single bridge in-lieu of twin bridges. This can be accomplished by providing a bridge of 69'-9" width.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by reducing total bridge width due to reduction in deck concrete, number of beams and foundation
- Reduced construction time
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Phased construction (staging) will be required
- Re-design effort will require minimal additional time
- Roadway alignments may require minor modifications

Technical Discussion:

The out-to-out width of 69'-9" (approx.) will accommodate standard barriers and 6' shoulder on the outside, two 12' travel lanes in each direction, 4' shoulders on the inside and an intermediate barrier for traffic separation with 2' buffers on either side. Spans 1, 2, 3, 5, 6 & 7 may be comprised of nine GDOT Tee Beam Decks. Span 4 may be comprised of nine AASHTO Type III PSC beams evenly spaced. The composition of the Bents will be similar to the current design except, cap lengths and foundation requirements will be reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 2,489,975	$ 0	$ 2,489,975
ALTERNATIVE	$ 1,954,033	$ 0	$ 1,954,033
SAVINGS	$ 535,942	$ 0	$ 535,942

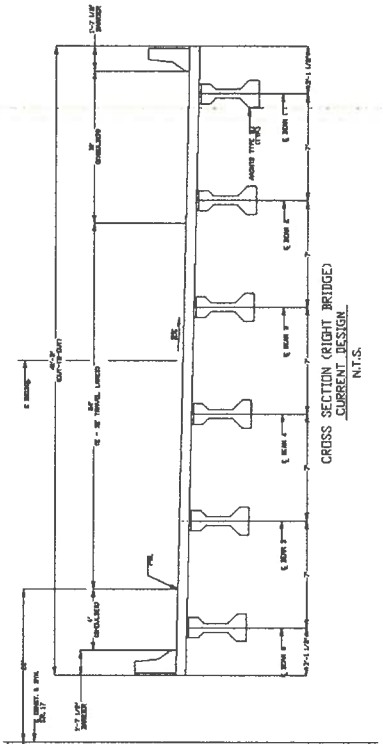
Illustrations

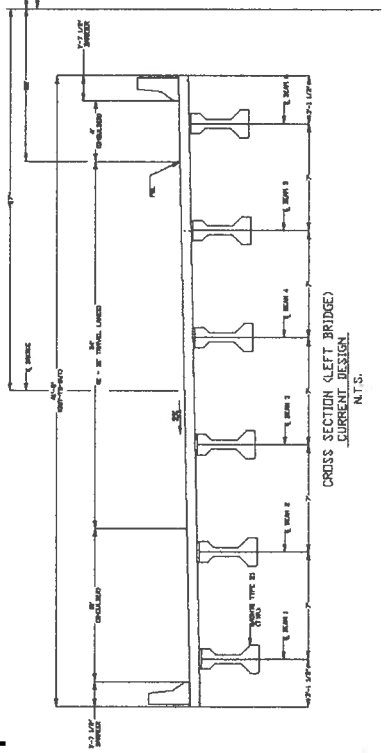
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

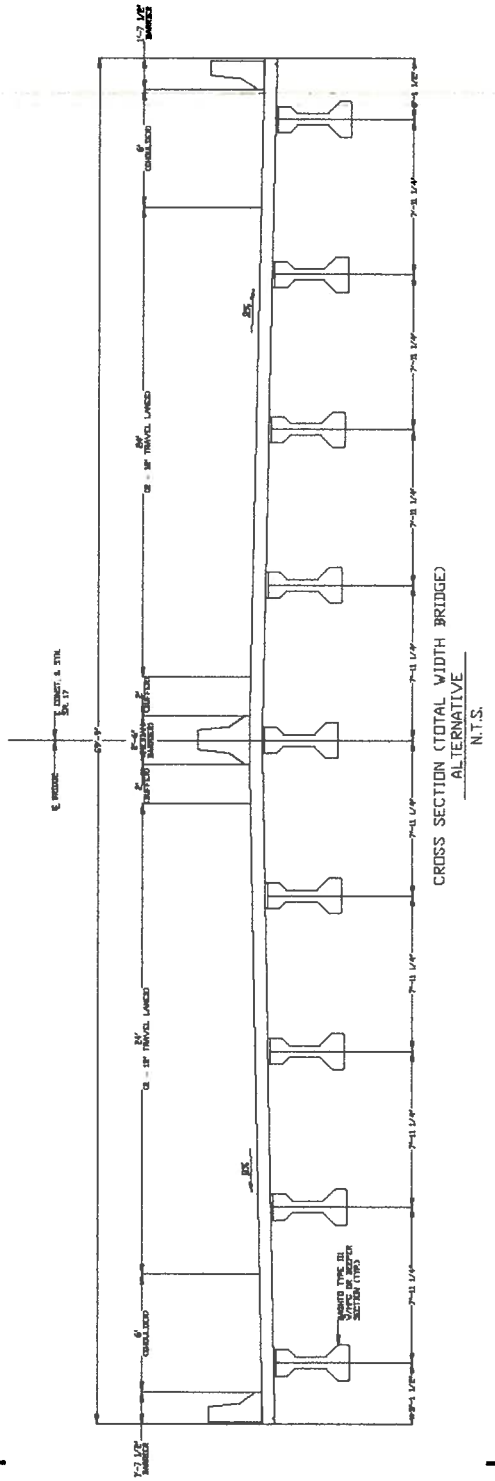
ALTERNATIVE NO.:

BCB-3

DESCRIPTION: **BIG CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**







Current Design (Twin, 7 Span – 320' Long, 41'-3" Out-to-Out)

Superstructure:

Deck Area = 2*320' * 41.25' (avg.) = 26,400 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[13200*(7.5"/12)]/27= 611.11 CY

Volume of Class AA Superstructure GDOT "T" Girder Concrete (36" X 18" each approx.) =

[2*6*(3'*1.5')*6*40]/27 = 480.00 CY

Total volume of Class AA Superstructure Deck Concrete = 611.11 + 480.00 = 1091.11 CY

Area of Grooved concrete (approx.) = 2*320'*36'/9 = 2,560 SY

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*6) = 960 LF

Total length of Barrier Rail (Standard) = 4*320 = 1,280 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[4*(42.5'*3'*3') + 2*(42.5*1.5'*1.5') + 2*(42.5'*3'*4')]}/27= 203.05 CY

End Bents (approx.): 2*2*{[44'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 84.22 CY

Total Volume of Class AA concrete = 287.27 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*6*32' + 4*15'] = 888 LF

Length of Steel HP 12X53 Piles (Intermediate Bents 2, 3, 6, 7 – 32 ft piles) = 2*4*(6*32) = 1,536 LF

Total length of Steel HP 12X53 Piles = 2424 LF

Length of Drilled Caissons (Intermediate Bents 4, 5 – 32 ft) = 2*2*3*32 = 384 LF

Alternative (Single, 7 Span – 320' Long, 69'-9" Out-to-Out)

Superstructure:

Deck Area = 320' * 69.75' (avg.) = 22,320 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

[22320*(7.5"/12)]/27= 516.67 CY

Volume of Class AA Superstructure GDOT "T" Girder Concrete (36" X 18" each approx.) =

[6*(3'*1.5')*9*40]/27 = 360.00 CY

Total volume of Class AA Superstructure Deck Concrete = 516.67 + 360.00 = 876.67 CY

Area of Grooved concrete (approx.) = 320'*60'/9 = 2,133.33 SY

Total length of AASHTO Type III PPC Girders (approx.) = 80'*9 = 720 LF

Total length of Barrier Rail (Standard) = 2*320 = 640 LF

Total length of Median Barrier = 1*320 = 320 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: {[4*(72'*3'*3') + 2*(72*1.5'*1.5') + 2*(72'*3'*4')]}/27= 172 CY

End Bents (approx.): 2*{[74'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 62.11 CY

Total Volume of Class AA concrete = 234.11 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = [2*9*32' + 4*15'] = 636 LF

Length of Steel HP 12X53 Piles (Intermediate Bents 2, 3, 6, 7 – 32 ft piles) = 4*(9*32) = 1152 LF

Total length of Steel HP 12X53 Piles = 1788 LF

Length of Drilled Caissons (Intermediate Bents 4, 5 – 32 ft) = 2*4*32 = 256 LF

Cost Estimate

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB - 3

DESCRIPTION: **BIG CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 5 of 5

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
AASHTO Type III PSC Beams	LF	960	145.81	139,977.60	720	145.81	104,983.20
Class "AA" Concrete (Sup)	CY	1091.1	1,122.40	1,224,661.86	876.67	1,122.40	983,974.41
Class "AA" Concrete (Sub)	CY	287.27	692.53	198,943.09	234.11	692.53	162,128.20
Concrete Deck Grooving	SY	2560	4.17	10,675.20	2133.33	4.17	8,895.99
Concrete Side Barrier	LF	1280	166.77	213,465.60	640	166.77	106,732.80
Concrete Intermediate Barrier	LF	0	262.17	0.00	320	262.17	83,894.40
Steel H Piles: HP 12X53	LF	2424	49.56	120,133	1788	49.56	88,613.28
Drilled Caisson	LF	384	926.45	355,757	256	926.45	237,171.20
	Sub-total			2,263,614			1,776,393
Mark-up at	**10.00%**			226,361			177,639
	TOTAL			**2,489,975**			**1,954,033**

Value Analysis Design Alternative

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **BCB-4**

DESCRIPTION: **BIG CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 1 of 6

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 7-span bridges, 320' long with Spans 1, 2, 3, 5, 6 & 7 at 40' and Span 4 at 80', over Big Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). Spans 1, 2, 3, 5, 6 & 7 are comprised of six GDOT Tee Beam Decks. Span 4 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. Bents 1, 2, 3, 6, 7 & 8 are made up of concrete caps supported on Steel "H" Piles while Bents 4 & 5 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:

The proposed alternative uses Steel "H" 12x53 piles (or as required per actual design) in lieu of Drilled Caissons at the intermediate Bents 4 & 5.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by replacing Drilled Caissons with Steel H Piles
- Ease of Pile Placement as opposed to Drilled Caisson Construction (ex: no cofferdams)
- Reduced construction time

Risks:

- Re-design effort will require minimal additional time

Technical Discussion:

The Bents 4 & 5 maybe supported by 12X53 Steel "H" piles under each of the Beam Centerlines / Bearing Line.

Two rows of Piles have been assumed at these Bents. The streamside row of piles could be battered.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 391,332	$ 0	$ 391,332
ALTERNATIVE	$ 83,737	$ 0	$ 83,737
SAVINGS	$ 307,596	$ 0	$ 307,596

Illustrations

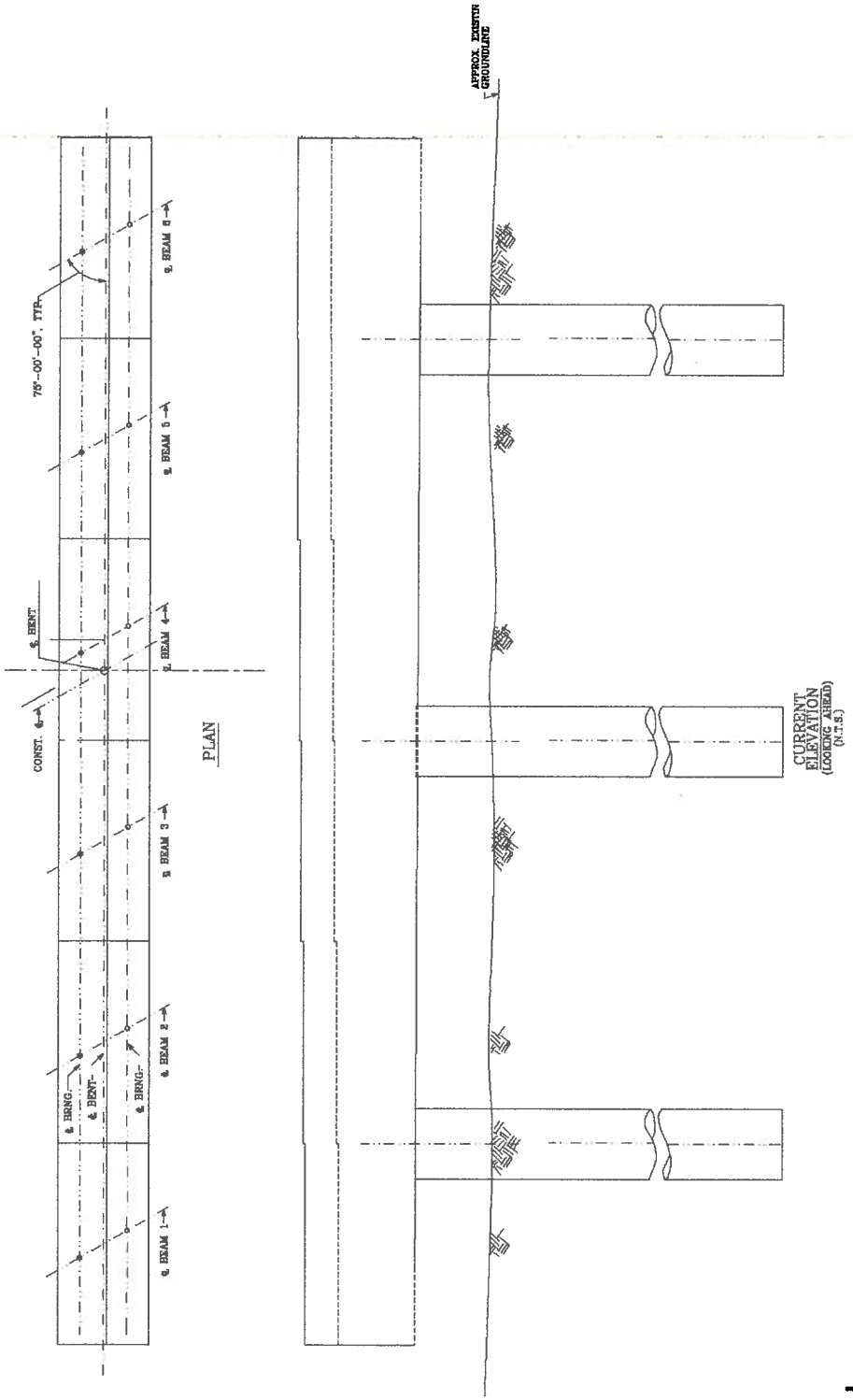
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB-4

DESCRIPTION: **BIG CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 2 of 6



Illustrations

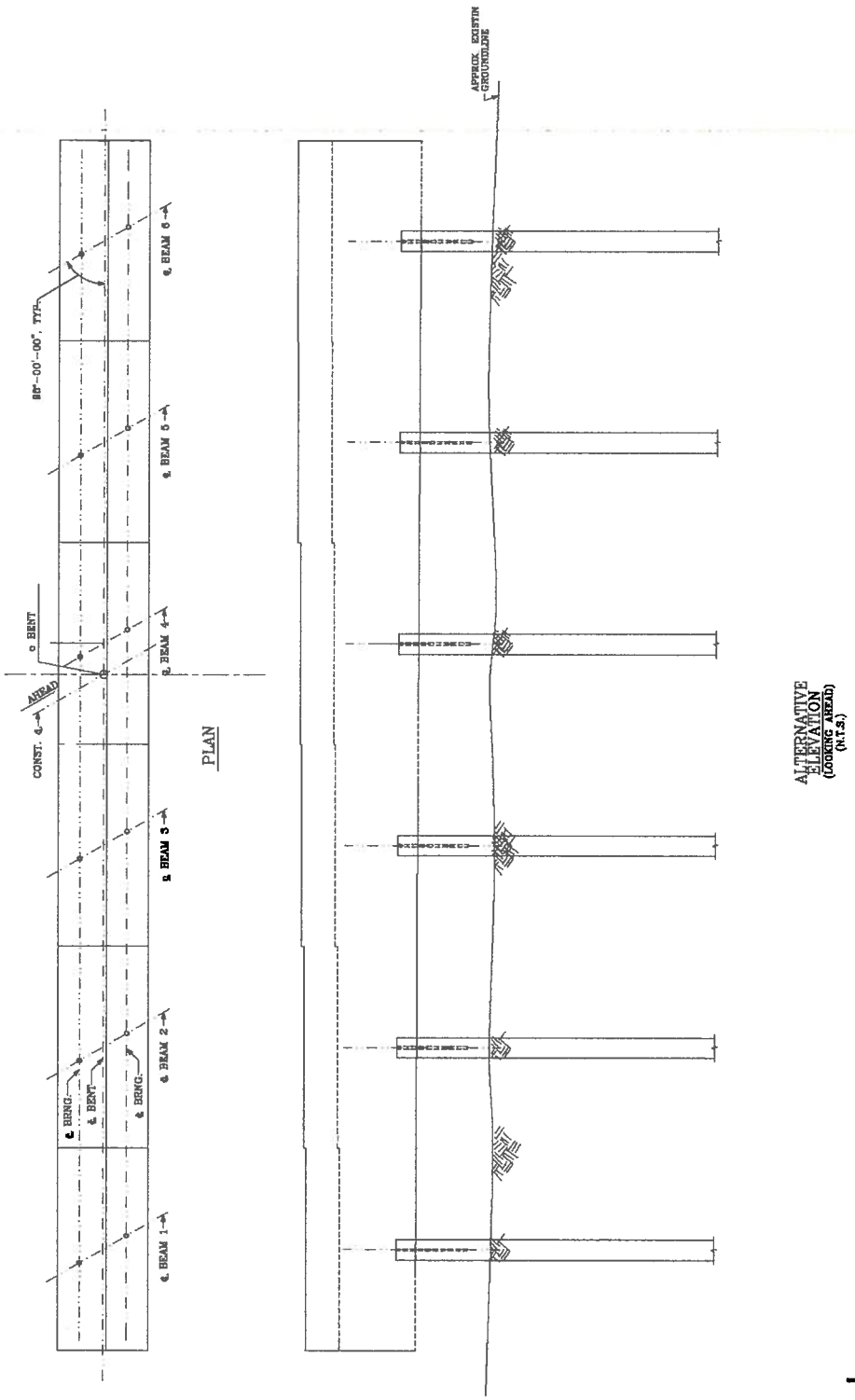
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB-4

DESCRIPTION: **BIG CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 3 of 6



Illustrations

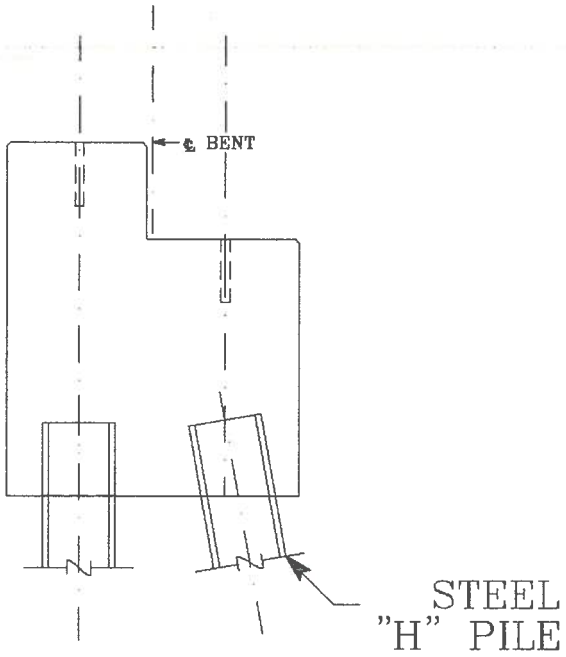
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

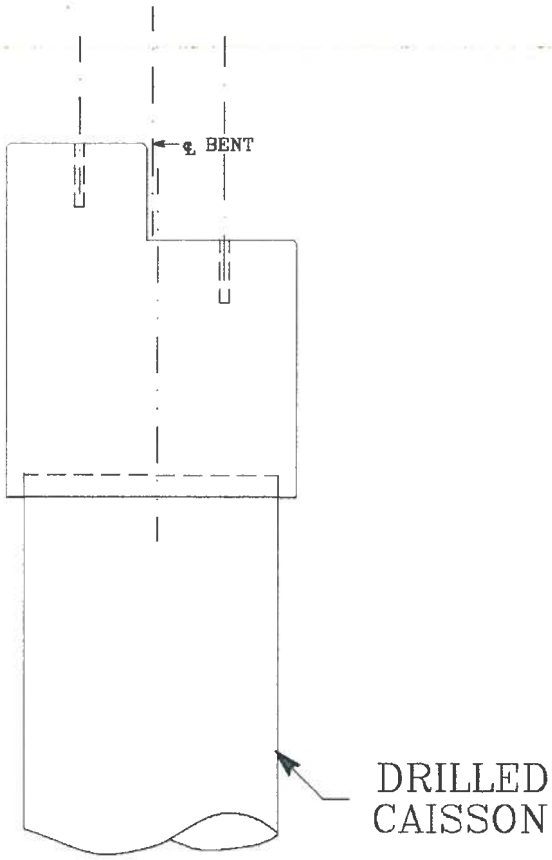
BCB-4

DESCRIPTION: **BIG CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 4 of 6



ALTERNATIVE
SECTION
N.T.S.



CURRENT
SECTION
N.T.S.

Calculations

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB-4

DESCRIPTION: **BIG CREEK BRIDGE - USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 5 of 6

Current Design (7 Span – 320' Long, with Drilled Caissons at Bents 4 & 5)

Bents 4 & 5:
Assumed Number of 48" diameter Drilled Caissons at each Bent = 3

Length of each Drilled Caisson = 32' (approx.)

Total length of Drilled Caissons for both bridges = 4*3*32' = 384 LF

Alternative Design (7 Span – 320' Long, with Steel "H" Piles at Bents 4 & 5)

Bents 4 & 5
Number of 12 X 53 Steel "H" Piles at each of Bents 4 & 5 (two rows, battered piles) = 2 X 6 =12

Length of each 12 X 53 Steel "H" Pile = 32' (approx.)

Total length of 12 X 53 Steel "H" Piles = 4*12*32 = 1536 LF

Cost Estimate

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB - 4

DESCRIPTION: **BIG CREEK BRIDGE - USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 6 of 6

CONSTRUCTION ITEM			ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM		UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Steel H Pile: HP 12X53		LF	0	49.56	0	1536	49.56	76,124.16
48" Diameter Drilled Caisson		LF	384	926.45	355,756.80	0	926.45	0
	Sub-total				355,757			76,124
Mark-up at	**10.00%**				35,576			7,612
	TOTAL				**391,332**			**83,737**

Value Analysis Design Alternative

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB-5

DESCRIPTION: **BIG CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 1 of 5

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 7-span bridges, 320' long with Spans 1, 2, 3, 5, 6 & 7 at 40' and Span 4 at 80', over Big Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). Spans 1, 2, 3, 5, 6 & 7 are comprised of six GDOT Tee Beam Decks. Span 4 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. Bents 1, 2, 3, 6, 7 & 8 are made up of concrete caps supported on Steel "H" Piles while Bents 4 & 5 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:

The proposed alternative uses a gutter-to-gutter bridge width of 32' for an out-to-out bridge width of 35'-3" for each of the twin bridges.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by reducing bridge width due to reduction in deck concrete, number of beams and foundation
- Reduced construction time
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal additional time

Technical Discussion:

The out-to-out width of 35'-3" (approx.) will accommodate standard barriers and 6' shoulder on the outsides, two 12' travel lanes in each direction and 2' buffers between the inside lanes and the barriers. Spans 1, 2, 3, 5, 6 & 7 may be comprised of five GDOT Tee Beam Decks. Span 4 may be comprised of five AASHTO Type III PSC beams evenly spaced. The composition of the Bents will be similar to the current design except, cap lengths and foundation requirements will be reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 2,489,975	$ 0	$ 2,489,975
ALTERNATIVE	$ 2,073,366	$ 0	$ 2,073,366
SAVINGS	$ 416,609	$ 0	$ 416,609

Illustrations

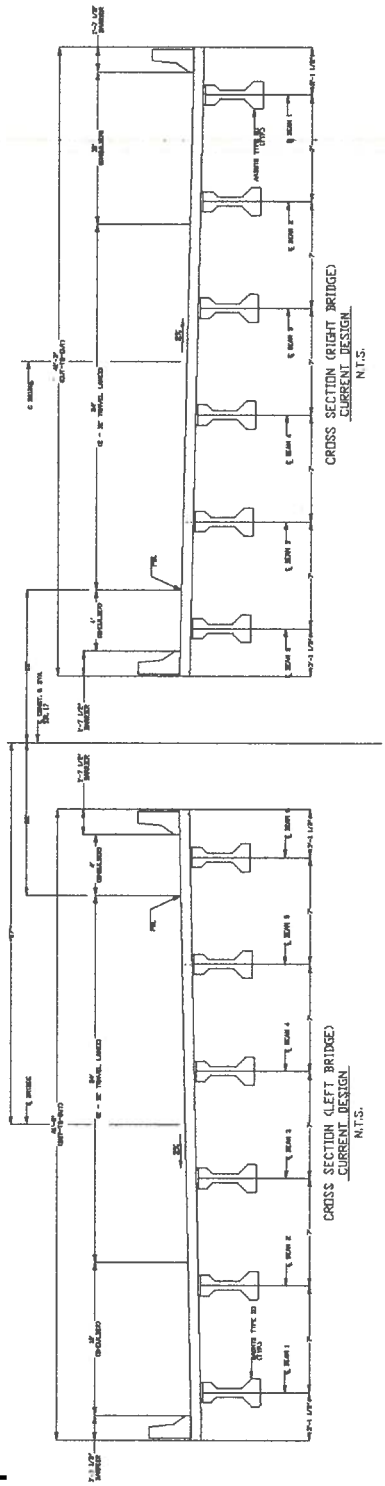
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

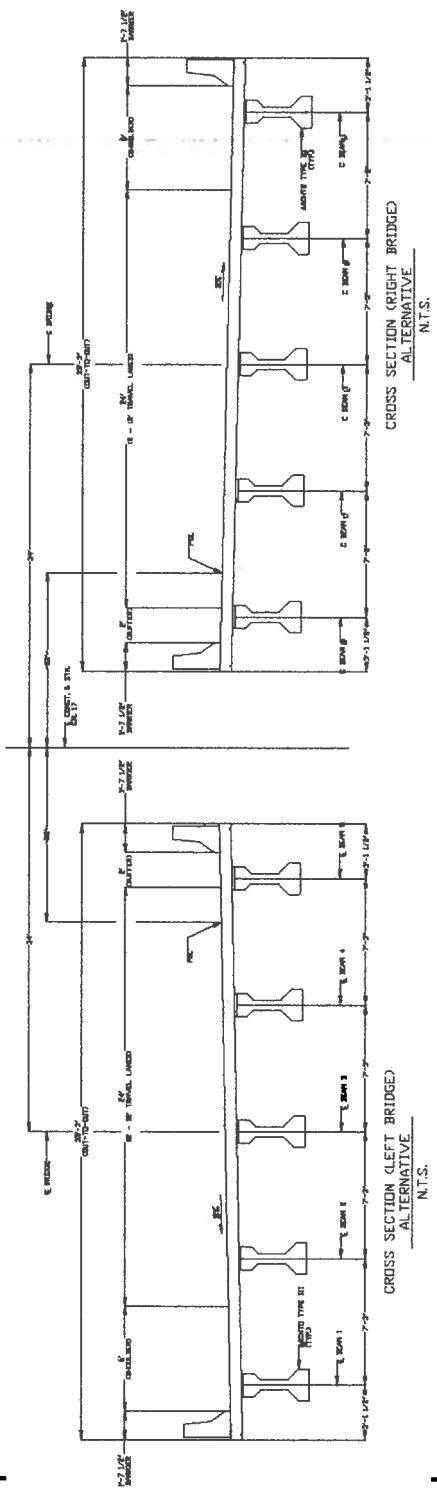
ALTERNATIVE NO.:

BCB-5

DESCRIPTION: **BIG CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 2 of 5





Calculations

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **BCB-5**

DESCRIPTION: **BIG CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 3 of 5

Current Design (Twin, 7 Span – 320' Long, 41'-3" Out-to-Out)

Superstructure:

Deck Area = 2*320' * 41.25' (avg.) = 26,400 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[13200*(7.5"/12)]/27= 611.11 CY

Volume of Class AA Superstructure GDOT "T" Girder Concrete (36" X 18" each approx.) =

[2*6*(3'*1.5')*6*40]/27 = 480.00 CY

Total volume of Class AA Superstructure Deck Concrete = 611.11 + 480.00 = 1091.11 CY

Area of Grooved concrete (approx.) = 2*320'*36'/9 = 2,560 SY

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*6) = 960 LF

Total length of Barrier Rail (Standard) = 4*320 = 1,280 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[4*(42.5'*3'*3') + 2*(42.5*1.5'*1.5') + 2*(42.5'*3'*4')]}/27= 203.05 CY

End Bents (approx.): 2*2*{[44'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 84.22 CY

Total Volume of Class AA concrete = 287.27 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*6*32' + 4*15'] = 888 LF

Length of Steel HP 12X53 Piles (Intermediate Bents 2, 3, 6, 7 – 32 ft piles) = 2*4*(6*32) = 1,536 LF

Total length of Steel HP 12X53 Piles = 2424 LF

Length of Drilled Caissons (Intermediate Bents 4, 5 – 32 ft) = 2*2*3*32 = 384 LF

Calculations

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **BCB-5**

DESCRIPTION: **BIG CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 4 of 5

Alternative (Twin, 7 Span – 320' Long, 35'-3" Out-to-Out)

Superstructure:

Deck Area = 2*320' * 35.25' (avg.) = 22,560 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[11280*(7.5"/12)]/27= 522.22 CY

Volume of Class AA Superstructure GDOT "T" Girder Concrete (36" X 18" each approx.) =

[2*6*(3'*1.5')*5*40]/27 = 400.00 CY

Total volume of Class AA Superstructure Deck Concrete = 522.22 + 400.00 = 922.22 CY

Area of Grooved concrete (approx.) = 2*320'*30'/9 = 2,133.33 SY

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*5) = 800 LF

Total length of Barrier Rail (Standard) = 4*320 = 1,280 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[4*(36.25'*3'*3') + 2*(36.25*1.5'*1.5') + 2*(36.25'*3'*4')]}/27= 173.19 CY

End Bents (approx.): 2*2*{[37.75'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 75.89 CY

Total Volume of Class AA concrete = 249.08 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*5*32' + 4*15'] = 760 LF

Length of Steel HP 12X53 Piles (Intermediate Bents 2, 3, 6, 7 – 32 ft piles) = 2*4*(5*32) = 1,280 LF

Total length of Steel HP 12X53 Piles = 2040 LF

Length of Drilled Caissons (Intermediate Bents 4, 5 – 32 ft) = 2*2*3*32 = 384 LF

Cost Estimate

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

BCB - 5

DESCRIPTION: **BIG CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 5 of 5

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
AASHTO Type III PSC Beams	LF	960	145.81	139,977.60	800	145.81	116,648.00
Class "AA" Concrete (Sup)	CY	1091.1	1,122.40	1,224,661.86	922.22	1,122.40	1,035,099.73
Class "AA" Concrete (Sub)	CY	287.27	692.53	198,943.09	249.08	692.53	172,495.37
Concrete Deck Grooving	SY	2560	4.17	10,675.20	2133.33	4.17	8,895.99
Concrete Side Barrier	LF	1280	166.77	213,465.60	1280	166.77	213,465.60
Concrete Intermediate Barrier	LF	0	262.17	0.00	0	262.17	0.00
Steel H Piles: HP 12X53	LF	2424	49.56	120,133	2040	49.56	101,102.40
Drilled Caisson	LF	384	926.45	355,757	256	926.45	237,171.20
	Sub-total			2,263,614			1,884,878
Mark-up at	**10.00%**			226,361			188,488
	TOTAL			**2,489,975**			**2,073,366**

Value Analysis Design Alternative

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **HCB-1**

DESCRIPTION: **HART CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 1 of 5

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 3-span bridges, 180' long with end Spans 1 & 3 at 50' and intermediate Span 2 at 80', over Hart Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). End Spans 1 & 3 are each comprised of six AASHTO Type II PSC beams evenly spaced. Intermediate Span 2 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. End Bents 1 & 4 are made up of concrete caps supported on Steel "H" Piles while Intermediate Bents 2 & 3 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:

The proposed alternative routes the Northbound and Southbound lanes on to one bridge in-lieu of twin bridges. This can be accomplished by providing a bridge of 69'-9" width.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by reducing total bridge width due to reduction in deck concrete, number of beams and foundation
- Reduced construction time
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Phased construction (staging) will be required
- Re-design effort will require minimal additional time
- Roadway alignments may require minor modifications

Technical Discussion:

The out-to-out width of 69'-9" (approx.) will accommodate standard barriers and 6' shoulder on the outside, two 12' travel lanes in each direction and an intermediate barrier for traffic separation with 2' buffers on either side. Spans 1 & 2 may be comprised of nine AASHTO Type III PSC beams evenly spaced. Span 4 may be comprised of nine AASHTO Type III PSC beams evenly spaced. Higher concrete strength or a deeper beam section may be used if required. The composition of the Bents will be similar to the current design except, cap lengths and foundation requirements will be reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 1,372,563	$ 0	$ 1,372,563
ALTERNATIVE	$ 1,060,965	$ 0	$ 1,060,965
SAVINGS	$ 311,598	$ 0	$ 311,598

Illustrations

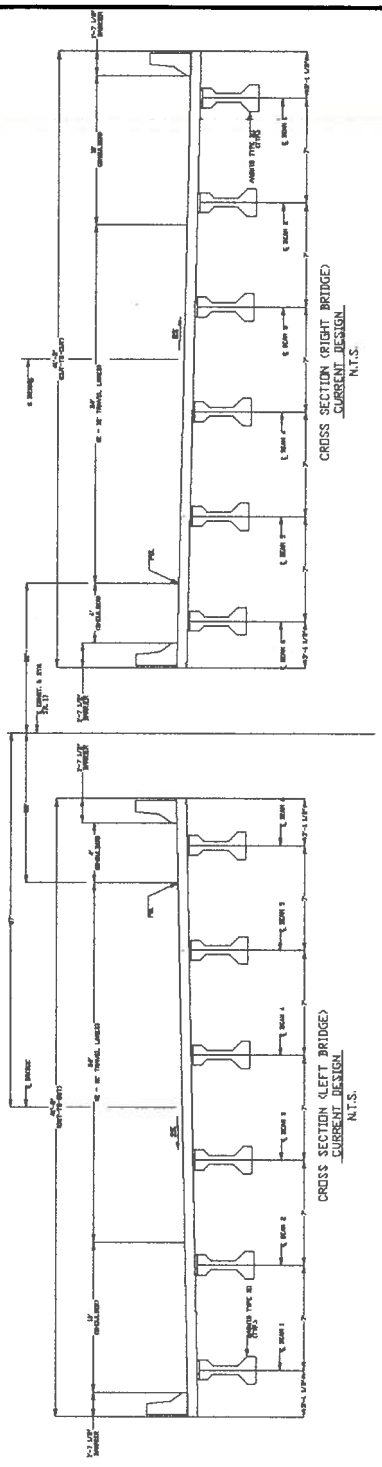
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

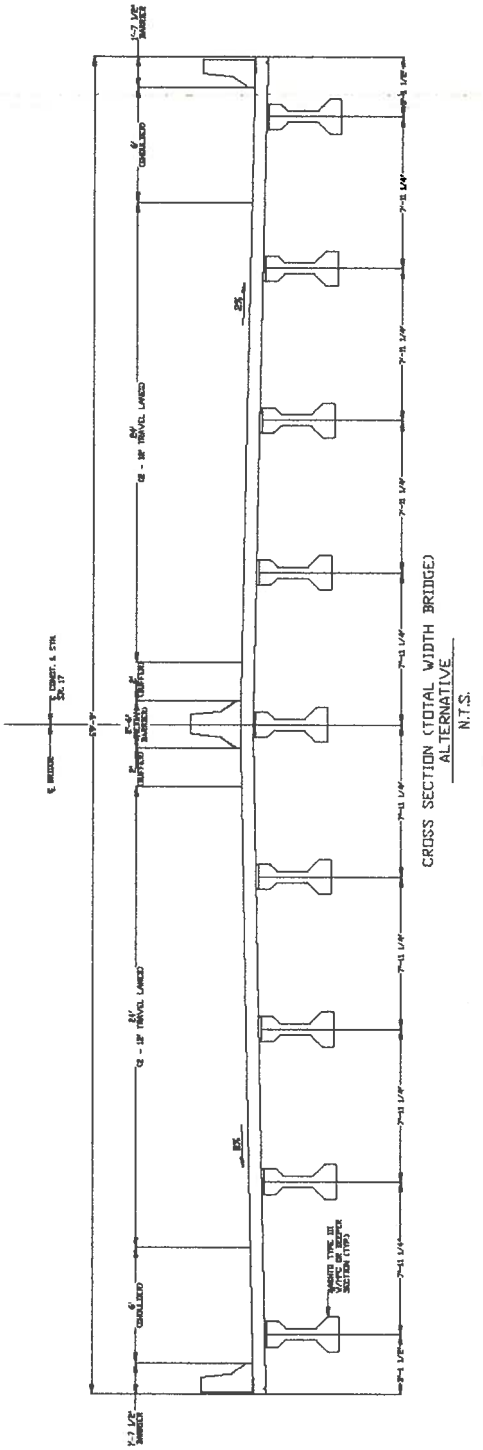
ALTERNATIVE NO.:

HCB-1

DESCRIPTION: **HART CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 2 of 5





Calculations

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:
HCB-1

DESCRIPTION: **HART CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 3 of 5

Current Design (Twin, 3 Span – 180' Long, 41'-3" Out-to-Out)

Superstructure:

Deck Area = 2*180' * 41.25' (avg.) = 14,850 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[7425*(7.5"/12)]/27= 343.75 CY

Area of Grooved concrete (approx.) = 2*180'*36'/9 = 1,440 SY

Total length of AASHTO Type II PPC Girders (approx.) = 2*(50'*6) = 600 LF

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*6) = 960 LF

Total length of Barrier Rail (Standard) = 4*180 = 720 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[2*(42.5*1.5'*1.5') + 2*(42.5'*3'*4')]}/27= 89.72 CY

End Bents (approx.): 2*2*{[44'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 84.22 CY

Total Volume of Class AA concrete = 173.94 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*6*32' + 4*15'] = 888 LF

Length of Drilled Caissons (Intermediate Bents 2, 3 – 32 ft) = 2*2*3*32 = 384 LF

Calculations

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:
HCB-1

DESCRIPTION: **HART CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 4 of 5

Alternative (Single, 3 Span – 180' Long, 69'-9" Out-to-Out)

Superstructure:

Deck Area = 180' * 69.75' (avg.) = 14,850 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

[12555*(7.5"/12)]/27= 290.63 CY

Area of Grooved concrete (approx.) = 2*180'*30'/9 = 1,200 SY

Total length of AASHTO Type II PPC Girders (approx.) = (50'*9) = 450 LF

Total length of AASHTO Type III PPC Girders (approx.) = (80'*9) = 720 LF

Total length of Barrier Rail (Standard) = 4*180 = 720 LF

Total length of Median Barrier = 1*180 = 180 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: {[2*(72*1.5'*1.5') + 2*(72'*3'*4')]}/27= 76 CY

End Bents (approx.): 2*{[74'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 62.11 CY

Total Volume of Class AA concrete = 138.11 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = [2*9*32' + 4*15'] = 636 LF

Length of Drilled Caissons (Intermediate Bents 2, 3 – 32 ft) = 2*4*32 = 256 LF

Cost Estimate

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

HCB - 1

DESCRIPTION: **HART CREEK BRIDGE – CONSTRUCT ONE NEW TOTAL WIDTH BRIDGE IN-LIEU OF TWO NEW BRIDGES**

SHEET NO.: 5 of 5

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
AASHTO Type II PSC Beams	LF	600	126.13	75,678.00	450	126.13	56,758.50
AASHTO Type III PSC Beams	LF	960	145.81	139,977.60	720	145.81	104,983.20
Class "AA" Concrete (Sup)	CY	343.75	1,122.40	385,825.00	290.63	1,122.40	326,203.11
Class "AA" Concrete (Sub)	CY	173.94	692.53	120,458.67	138.11	692.53	95,645.32
Concrete Deck Grooving	SY	1440	4.17	6,004.80	1200	4.17	5,004.00
Concrete Side Barrier	LF	720	166.77	120,074.40	360	166.77	60,037.20
Concrete Intermediate Barrier	LF	0	262.17	0.00	180	262.17	47,190.60
Steel H Piles: HP 12X53	LF	888	49.56	44,009.00	636	49.56	31,520.16
Drilled Caisson	LF	384	926.45	355,757.00	256	926.45	237,171.20
	Sub-total			1,247,785			964,513
Mark-up at	**10.00%**			124,778			96,451
	TOTAL			**1,372,563**			**1,060,965**

Value Analysis Design Alternative

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **HCB-2**

DESCRIPTION: **HART CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 1 of 6

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 3-span bridges, 180' long with end Spans 1 & 3 at 50' and intermediate Span 2 at 80', over Hart Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). End Spans 1 & 3 are each comprised of six AASHTO Type II PSC beams evenly spaced. Intermediate Span 2 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. End Bents 1 & 4 are made up of concrete caps supported on Steel "H" Piles while Intermediate Bents 2 & 3 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:

The proposed alternative uses Steel "H" 12x53 Piles (or as required per actual design) in lieu of Drilled Caissons at the intermediate Bents 2 & 3.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by replacing Drilled Caissons with Steel H Piles
- Ease of Pile Placement as opposed to Drilled Caisson Construction
- Reduced construction time

Risks:

- Re-design effort will require minimal additional time

Technical Discussion:

The Bents 2 & 3 maybe supported by 12X53 Steel "H" piles under each of the Beam Centerlines / Bearing Line.

Two rows of Piles have been assumed at these Bents. The streamside row of piles could be battered.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 391,332	$ 0	$ 391,332
ALTERNATIVE	$ 83,737	$ 0	$ 83,737
SAVINGS	$ 307,596	$ 0	$ 307,596

Illustrations

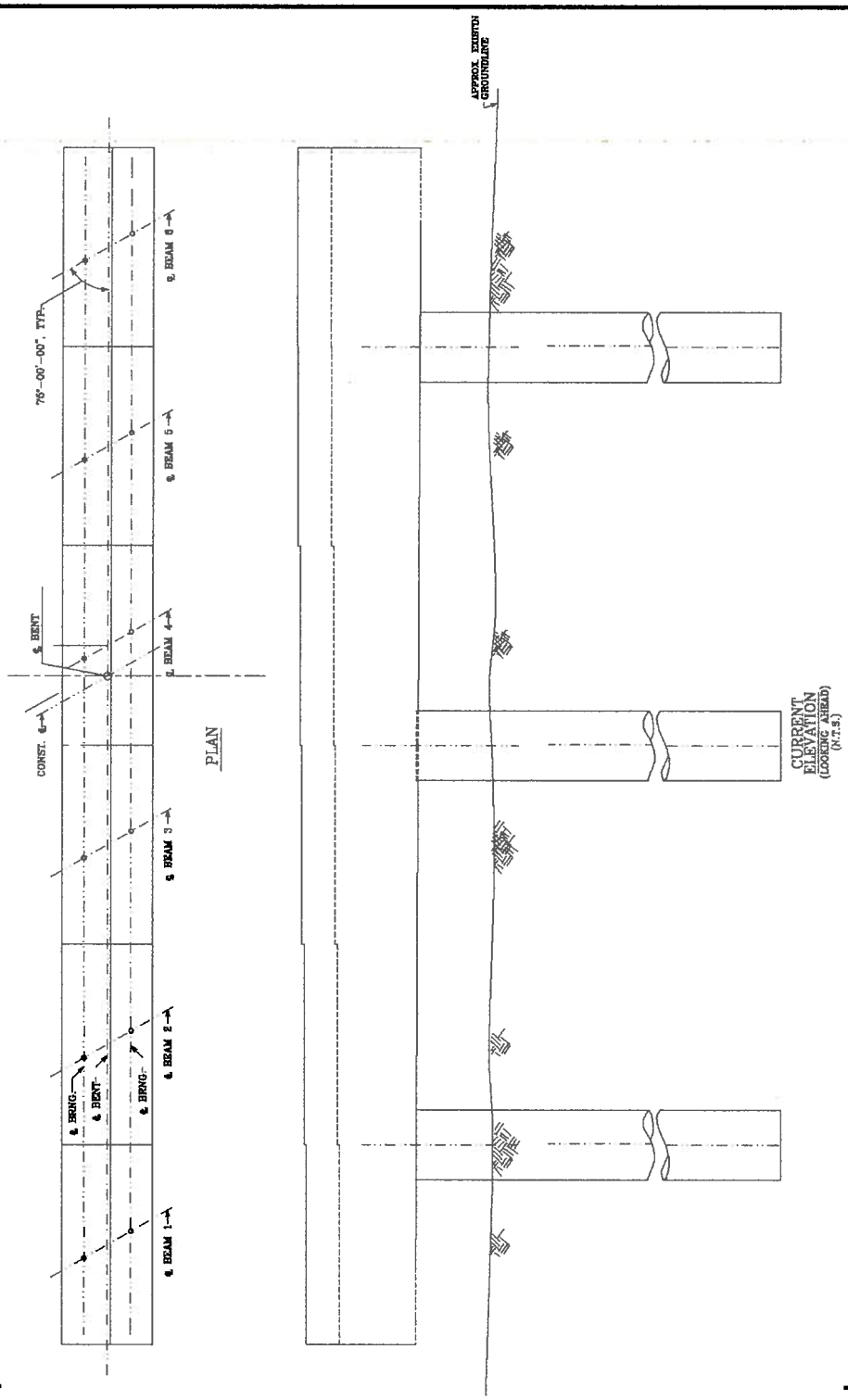
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

HCB-2

DESCRIPTION: **HART CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 2 of 6



Illustrations

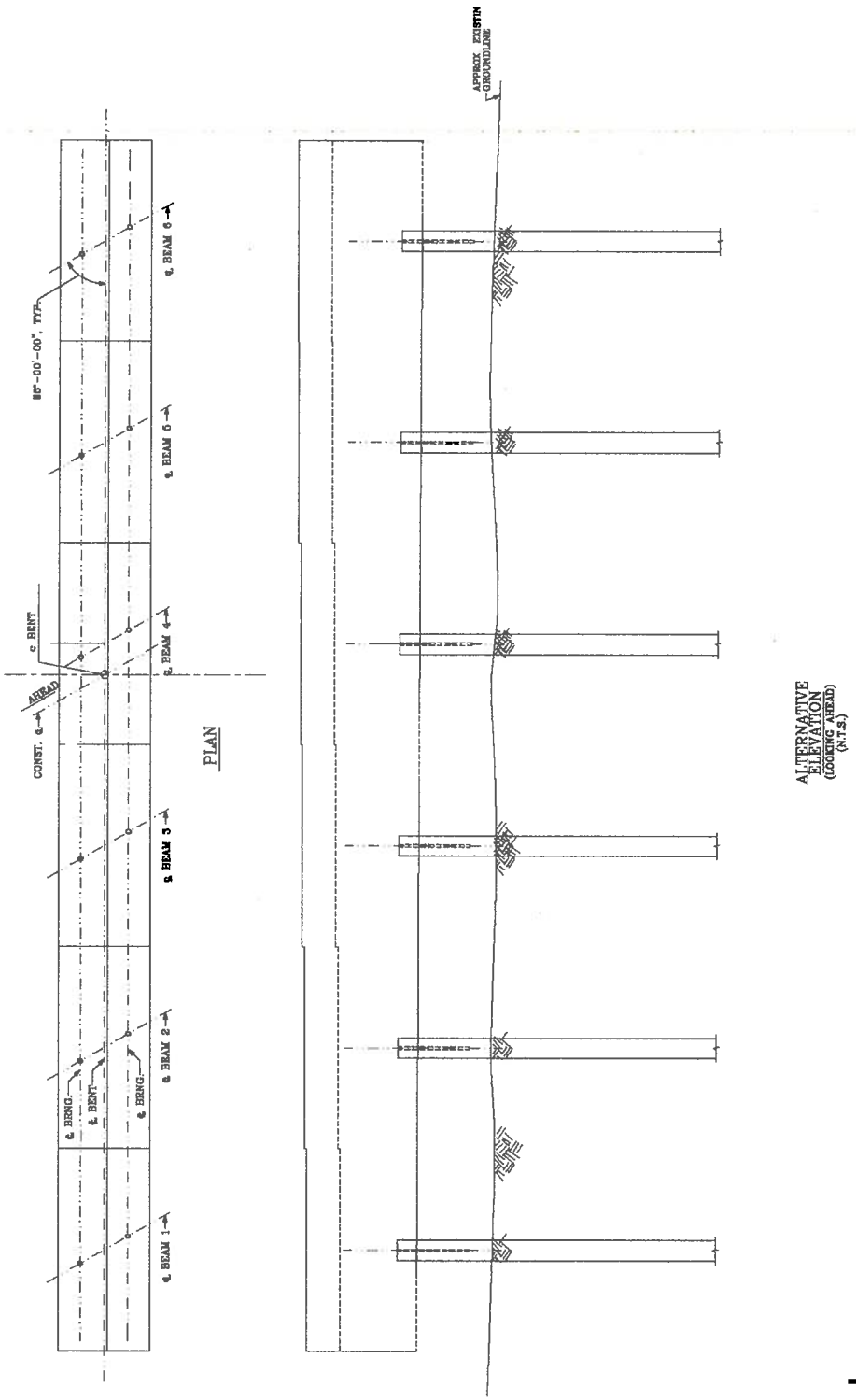
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

HCB-2

DESCRIPTION: **HART CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 3 of 6



Illustrations

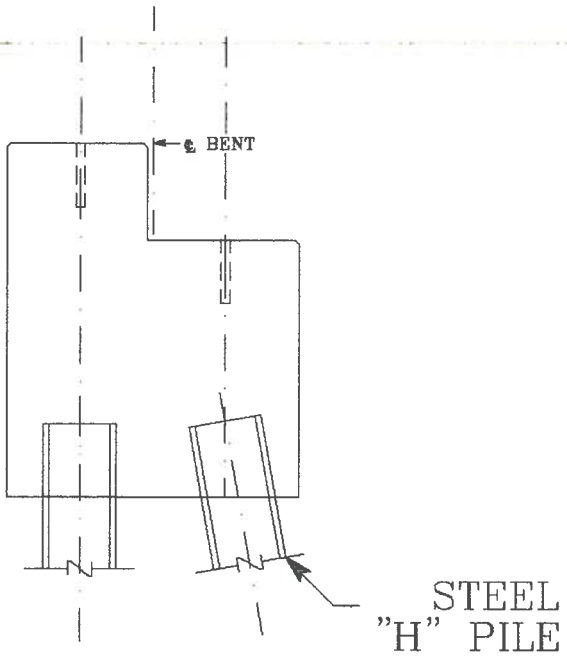
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

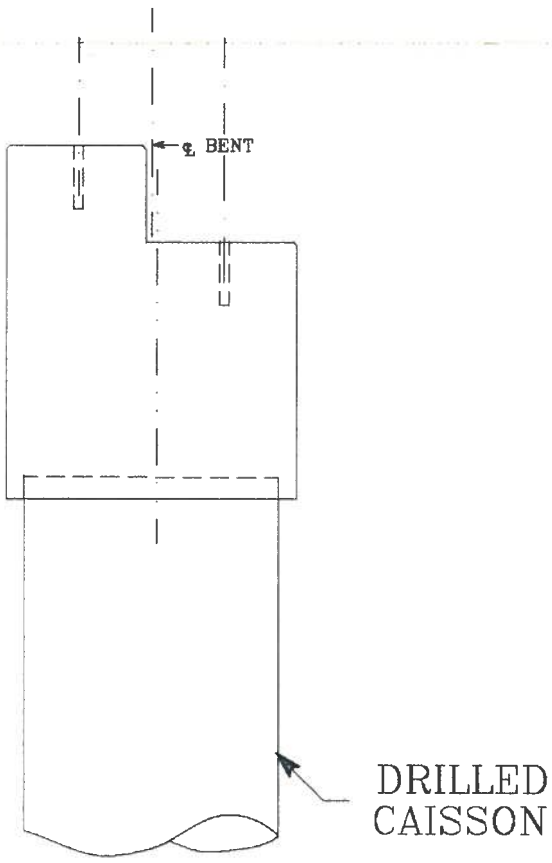
HCB-2

DESCRIPTION: **HART CREEK BRIDGE – USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 4 of 6



ALTERNATIVE
SECTION
N.T.S.



CURRENT
SECTION
N.T.S.

Current Design (3 Span – 180' Long, with Drilled Caissons at Bents 4 & 5)

Bents 2 & 3:

Assumed Number of 48" diameter Drilled Caissons at each Bent = 3

Length of each Drilled Caisson = 32' (approx.)

Total length of Drilled Caissons for both bridges = 4*3*32' = 384 LF

Alternative Design (3 Span – 180' Long, with Steel "H" Piles at Bents 4 & 5)

Bents 2 & 3

Number of 12 X 53 Steel "H" Piles at each of Bents 4 & 5 (two rows, battered piles) = 2 X 6 =12

Length of each 12 X 53 Steel "H" Pile = 32' (approx.)

Total length of 12 X 53 Steel "H" Piles = 4*12*32 = 1536 LF

Cost Estimate

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **HCB - 2**

DESCRIPTION: **HART CREEK BRIDGE - USE STEEL "H" PILES IN LIEU OF DRILLED CAISSONS**

SHEET NO.: 6 of 6

CONSTRUCTION ITEM			ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM		UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Steel H Pile: HP 12X53		LF	0	49.56	0	1536	49.56	76,124.16
48" Diameter Drilled Caisson		LF	384	926.45	355,756.80	0	926.45	0.00
	Sub-total				355,757			76,124
Mark-up at	10.00%				35,576			7,612
	TOTAL				**391,332**			**83,737**

Value Analysis Design Alternative

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: **HCB-3**

DESCRIPTION: **HART CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 1 of 5

Original Design: (The VE team realizes that there is some design information not yet available for the project. Appropriate assumptions have been made in their place).

The original design calls for the construction of identical twin 3-span bridges, 180' long with end Spans 1 & 3 at 50' and intermediate Span 2 at 80', over Hart Creek. The bridges are on a vertical sag and skewed to the normal at 25°. The out-to-out width of the bridges is 41'-3" (approx.). End Spans 1 & 3 are each comprised of six AASHTO Type III PSC beams evenly spaced. Intermediate Span 2 is comprised of six AASHTO Type III PSC beams evenly spaced. The bridges accommodate a 10' shoulder on the outside, two 12' travel lanes and a 4' shoulder on the inside. End Bents 1 & 4 are made up of concrete caps supported on Steel "H" Piles while Intermediate Bents 2 & 3 are made up of concrete caps supported on Drilled Caissons. The barrier rails are standard.

Alternative Design:

The proposed alternative uses a gutter-to-gutter bridge width of 32' for an out-to-out bridge width of 35'-3" for each of the twin bridges.

The alternative maintains all other current geometry.

Opportunities:

- Cost savings by reducing bridge width due to reduction in deck concrete, number of beams and foundation
- Reduced construction time
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal additional time

Technical Discussion:

The out-to-out width of 35'-3" (approx.) will accommodate standard barriers and 6' shoulder on the outsides, two 12' travel lanes in each direction and 2' buffers between the inside lanes and the barriers. Spans 1 & 3 may be comprised of five AASHTO Type III PSC beams evenly spaced. Span 2 may be comprised of five AASHTO Type III PSC beams evenly spaced. The composition of the Bents will be similar to the current design except, cap lengths and foundation requirements will be reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 1,372,563	$ 0	$ 1,372,563
ALTERNATIVE	$ 1,246,822	$ 0	$ 1,246,822
SAVINGS	$ 125,741	$ 0	$ 125,741

Illustrations

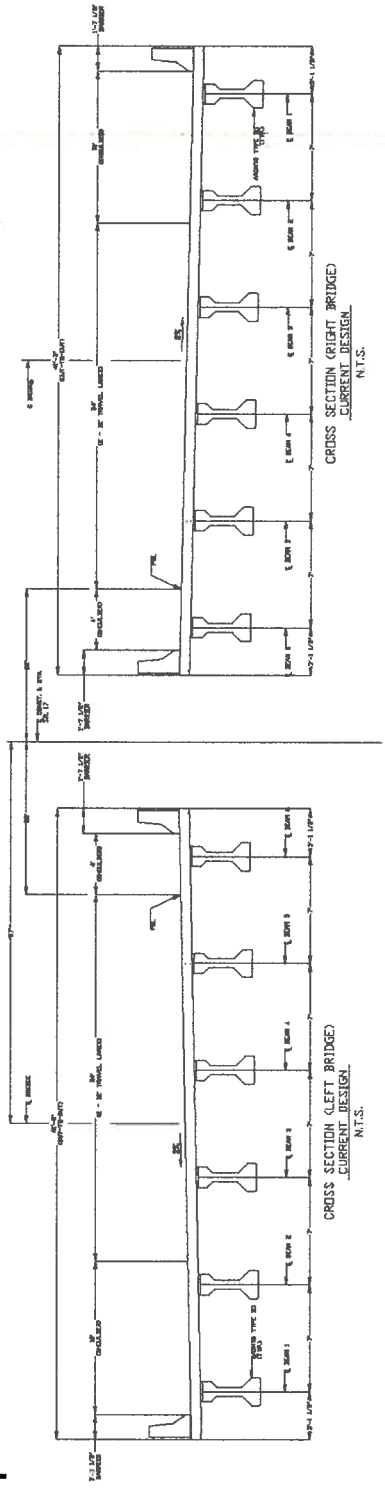
GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County -- P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

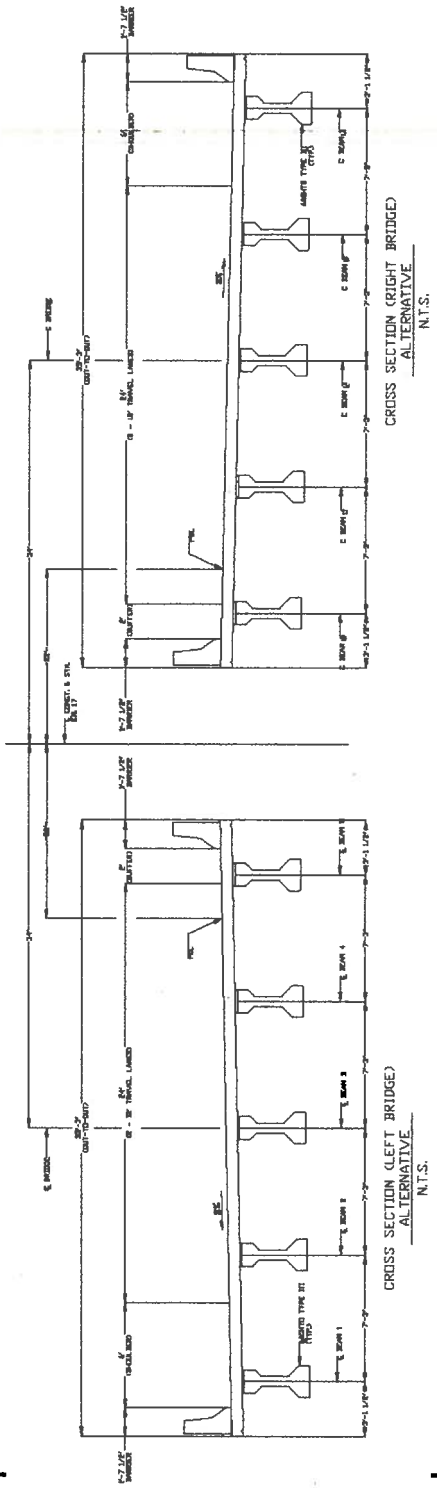
ALTERNATIVE NO.:

HCB-3

DESCRIPTION: **HART CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 2 of 5





Calculations

PBSJ

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:
HCB-3

DESCRIPTION: **HART CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 3 of 5

Current Design (Twin, 3 Span – 180' Long, 41'-3" Out-to-Out)

Superstructure:
Deck Area = 2*180' * 41.25' (avg.) = 14,850 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[7425*(7.5"/12)]/27= 343.75 CY

Area of Grooved concrete (approx.) = 2*180'*36'/9 = 1,440 SY

Total length of AASHTO Type II PPC Girders (approx.) = 2*(50'*6) = 600 LF

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*6) = 960 LF

Total length of Barrier Rail (Standard) = 4*180 = 720 LF

Substructure:
Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[2*(42.5*1.5'*1.5') + 2*(42.5'*3'*4')]}/27= 89.72 CY

End Bents (approx.): 2*2*{[44'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 84.22 CY

Total Volume of Class AA concrete = 173.94 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*6*32' + 4*15'] = 888 LF

Length of Drilled Caissons (Intermediate Bents 2, 3 – 32 ft) = 2*2*3*32 = 384 LF

Calculations

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.: HCB-3

DESCRIPTION: **HART CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

Alternative (Single, 3 Span – 180' Long, 35'-3" Out-to-Out)

Superstructure:

Deck Area = 2*180' * 35.25' (avg.) = 12,690 SF

Volume of 7 1/2" (assumed) thick Class AA Superstructure Deck concrete =

2*[6345*(7.5"/12)]/27= 293.75 CY

Area of Grooved concrete (approx.) = 2*180'*30'/9 = 1,200 SY

Total length of AASHTO Type II PPC Girders (approx.) = 2*(50'*5) = 500 LF

Total length of AASHTO Type III PPC Girders (approx.) = 2*(80'*5) = 800 LF

Total length of Barrier Rail (Standard) = 4*180 = 720 LF

Substructure:

Volume of Class AA concrete (average dimensions of Caps, Piles, Drilled Caissons):

Intermediate Bents: 2*{[2*(36.25*1.5'*1.5') + 2*(36.25'*3'*4')]}/27= 76.53 CY

End Bents (approx.): 2*2*{[37.75'*3'*3'] + [2*11.5'*1'*7.5']}/27 = 75.89 CY

Total Volume of Class AA concrete = 152.42 CY

Length of Steel HP 12X53 Piles (End Bents – 32 ft piles) = 2*[2*5*32' + 4*15'] = 760 LF

Length of Drilled Caissons (Intermediate Bents 2, 3 – 32 ft) = 2*2*3*32 = 384 LF

Cost Estimate

GEORGIA DEPARTMENT OF TRANSPORTATION
Project No.: EDS-545-(40) McDuffie County – P.I. Number: 222250
SR 17 From SR 43 to West of CR 6

ALTERNATIVE NO.:

HCB - 3

DESCRIPTION: **HART CREEK BRIDGE – USE A 32' BRIDGE WIDTH (GUTTER-TO-GUTTER)**

SHEET NO.: 5 of 5

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
AASHTO Type II PSC Beams	LF	600	126.13	75,678.00	500	126.13	63,065.00
AASHTO Type III PSC Beams	LF	960	145.81	139,977.60	800	145.81	116,648.00
Class "AA" Concrete (Sup)	CY	343.75	1,122.40	385,825.00	293.75	1,122.40	329,705.00
Class "AA" Concrete (Sub)	CY	173.94	692.53	120,458.67	152.42	692.53	105,555.42
Concrete Deck Grooving	SY	1440	4.17	6,004.80	1200	4.17	5,004.00
Concrete Side Barrier	LF	720	166.77	120,074.40	720	166.77	120,074.40
Concrete Intermediate Barrier	LF	0	262.17	0.00	0	262.17	0.00
Steel H Piles: HP 12X53	LF	888	49.56	44,009	760	49.56	37,665.60
Drilled Caisson	LF	384	926.45	355,757	384	926.45	355,756.80
	Sub-total			1,247,785			1,133,474
Mark-up at	**10.00%**			124,778			113,347
	TOTAL			**1,372,563**			**1,246,822**

Value Analysis Design Suggestion

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **D-1**

DESCRIPTION: Consider Jack & Bore in-lieu of an "open cut" for Stage I construction

SHEET NO.: 1 of 1

Original Design:

The original design provides for storm drain pipe cross drains to be installed in numerous locations. Depths of installation vary from four feet to twenty plus feet. Pay items indicate open cut trench excavation wll be used.

Alternative:

The alternative design would specify jack and bore for pipe installation in the existing roadway sections. The alternative will allow cross drain installation in plan locations.

Opportunities:

- Maintain drainage
- Minimize open cut installation to shallow cross drains
- Facilitate construction

Risks:

- Jack and bore increases construction costs
-

Value Analysis Design Suggestion

GEORGIA DEPARTMENT OF TRANSPORTATION
PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **D-3**

DESCRIPTION: Consider using "Jack and Bore storm drain pipes" in-lieu of box culverts for drainage crossing under the existing roadway

SHEET NO.: 1 of 1

Original Design:

Provides for concrete box culverts to be installed in four locations – Sta. 22+60, Sta. 93+50, Sta. 207+34, and Sta. 302+54. Construction of box culverts must be staged.

Alternative:

Designate single or double lines of storm drain pipe for replacement of the concrete box culverts. In lieu of constructing these installations in two stages, jack and bore operation could be utilized for a one stage operation.

Opportunities:

- Simplified construction
- Single stage operation

Risks:

- Increased costs
- Redesign required

Value Analysis Design Suggestion

PBS&J

GEORGIA DEPARTMENT OF TRANSPORTATION

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County - P.I. No.: 222250, 227815, 227816, SR 17 from SR 43 to West of SR 6

ALTERNATIVE NO.: **D-4**

DESCRIPTION: Review and modify the construction documents and or staging plan as need be to transport stormwater runoff from new southbound lanes to an outfall on east side of northbound lanes. May need to consider routing runoff north or south in median to be able to cross northbound lanes.

SHEET NO.: 1 of 1

Original Design:

Stage one and two construction creates a depressed median. Drop inlets are constructed and storm drain pipe cross drains are installed to drain the water easterly in numerous locations. The easterly lanes will have traffic during these two stages.

Alternative:

In lieu of cross drains from the median inlet to the easterly shoulder, longitudinal pipe would be installed in the median to connect with new cross drains. The cross drains would be eliminated only for deep cuts.

Opportunities:

- Eliminate cross drain installation across active lanes

Risks:

- Increased storm drain quantities

Project Description

Project Description

INTRODUCTION

This project consists of the widening of the existing SR 17 from SR 43 to West of SR 6 in McDuffie County. The project - EDS-545(40), BRN-014-1(73)(74) McDuffie County, P.I. Nos.: 222250, 227815, 227816, will also replace two bridges, one over Big Creek and one over Hart Creek. The design is being performed by STANTEC.

At the time of this study, the estimated cost of this construction, not including right-of-way purchase, was approximately $27,348,786.30 dollars. The estimated cost of Right-of-way acquisition was estimated at $2,733,500 dollars.

Please see the following enclosed documents:

- Preliminary Right of Way Cost Estimate
- GDOT Cost Estimate
- Concept Plan for EDS-545(40), BRN-014-1(73)(74) McDuffie County, P.I. No.: 222250, 227815, 227816
- Preliminary Field Plan Review Inspection Report

The VE Team utilized the supplied project materials noted above, along with the STANTEC construction drawings, and the GDOT current standard drawings, details and specifications, during the conduct of their work in the VE Study effort.

Department of Transportation

State of Georgia

Interdepartmental Correspondence

FILE R/W Cost Estimate
DB | GAM
OFFICE Atlanta
DATE October 11, 2005

FROM Don Brown, Right of Way Administrator

TO To: Babs Abubakari, P.E. State Consultant Design Engineer

Attention : Tom Cox

SUBJECT **Preliminary Right of Way Cost Estimate**
Project: EDS-545(40)McDuffie
P.I. No.: 222250
Description: SR 17 from SR 43 to West of CR 6

As per your request, attached is a copy of the approved Preliminary Right of Way Cost Estimates on the above referenced projects.

Please note the area of Required R/W was furnished with your request. **Please include total Required R/W areas for the entire corridor in all future requests.**

If you have any questions, please contact Jerry Milligan at the West Annex Right of Way Office at (770) 986-1541.

DB:GAM:jm
Attachments
c: Brian Summers, Engineering Services
Wilhelmina Mueller, R/W
Windy Bickers, Financial Management
File

Preliminary Right of Way Cost Estimate

Date:	**September 30, 2005**		
Project:	**EDS-545(40), McDuffie**	**P.I. Number:**	**222250**
Existing/Required R/W:	**Varies/Varies**	**No. Parcels:**	**59**
Project Termini:	**SR 17 from SR 43 to West of CR. 6**		
Project Description:	**4 lane with median**		

Land:

	Small Tract Residential			
R/W	**11**	**Ac.**	**@ $ 6,000/ Ac.**	**= $ 66,000**
	Medium Tract Residential			
R/W	**28**	**Ac.**	**@ $ 3,000/Ac.**	**= $ 84,000**
	Large Tract			
R/W	**50**	**Ac.**	**@ $2,250 /Ac.**	**= $ 112,500**

Improvements: **1 House, 1Day Care, 1Church, 1 Store (vacant), Signs, Fencing and Site improvements** **= $ 396,800**

Relocation:

1 Residential @ $ 20,000.00 = $ 20,000
2 Business @ $ 25,000.00 = $ 50,000

= $ 70,000

Damages:

Proximity - 3 Parcels = $ 58,000

= $ 58,000

Net Cost		**$ 787,300**
Scheduling Contingency	**55 %**	**$ 433,000**
Adm/Court Cost	**60 %**	**$ 732,200**
Inflation Factor	**40 %**	**$ 781,000**
		$ 2,733,500 **Rd.**

Total Cost $ 2,733,500

Prepared By : Dean Williamson
Dean Williamson

Approved :
GDOT R/W

McDuffie County Land Sales

EDS-545(40), McDuffie

Highest & Best Use	Size (acres)	Value/sf./ ac.	Sales price
Small Residential Lot	1.0	$ 6,100/ac	$ 6,100
	2.40	6,458/ac	15,500
	2.99	6,000/ac	18,000
Medium Residential			
	16.46	3,098/ac	51,000
	7.89	3,000/ac	23,700
	31.99	2,750/ac	88,000
Large Residential	170.1	2,233/ac	380,000
	109.5	2,175/ac	238,200
	105.97	1,916/ac	203,000

Estimate Report for file "PI 222250"

Section ROADWAY

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	250000.00	TRAFFIC CONTROL -	250000.00
153-1300	1	EA	76000.00	FIELD ENGINEERS OFFICE TP 3	76000.00
201-1500	1	LS	2200000.00	CLEARING & GRUBBING -	2200000.00
205-0001	281900	CY	6.98	UNCLASS EXCAV	1967662.00
206-0002	314100	CY	6.62	BORROW EXCAV, INCL MATL	2079342.00
310-1101	13000	TN	17.40	GR AGGR BASE CRS, INCL MATL	226200.00
318-3000	2000	TN	25.23	AGGR SURF CRS	50460.00
402-1812	6700	TN	50.00	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	335000.00
402-3112	27500	TN	80.00	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	2200000.00
402-3121	79900	TN	80.00	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	6392000.00
402-3129	23300	TN	80.00	RECYCLED ASPH CONC 12.5 MM MIX, GP 2 ONLY, INCL BITUM MATL & H LIME	1864000.00
413-1000	33500	GL	2.50	BITUM TACK COAT	83750.00
433-1000	868	SY	165.87	REINF CONC APPROACH SLAB	143975.16
441-0740	2400	SY	30.26	CONCRETE MEDIAN, 4 IN	72624.00
441-6720	4000	LF	11.78	CONC CURB & GUTTER, 6 IN X 30 IN, TP 7	47120.00
456-2015	14	GLM	771.72	INDENTATION RUMBLE STRIPS - GROUND-IN-PLACE (SKIP)	10804.08
634-1200	103	EA	111.30	RIGHT OF WAY MARKERS	11463.90
641-1100	170	LF	56.49	GUARDRAIL, TP T	9603.30
641-1200	8900	LF	18.54	GUARDRAIL, TP W	165006.00
641-5001	22	EA	617.35	GUARDRAIL ANCHORAGE, TP 1	13581.70
641-5012	22	EA	1871.80	GUARDRAIL ANCHORAGE, TP 12	41179.60
				Section Sub Total:	**$18,239,771.74**

Section DRAINAGE

Item Number	Quantity	Units	Unit Price	Item Description	Cost
207-0203	105	CY	50.55	FOUND BKFILL MATL, TP II	5307.75
500-3101	2030	CY	578.66	CLASS A CONCRETE	1174679.80
511-1000	51900	LB	0.95	BAR REINF STEEL	49305.00
550-1150	6800	LF	41.50	STORM DRAIN PIPE, 15 IN, H 1-10	282200.00
550-1180	160	LF	41.02	STORM DRAIN PIPE, 18 IN, H 1-10	6563.20
550-1240	1600	LF	53.78	STORM DRAIN PIPE, 24 IN, H 1-10	86048.00
550-1300	650	LF	65.92	STORM DRAIN PIPE, 30 IN, H 1-10	42848.00
550-1360	350	LF	77.97	STORM DRAIN PIPE, 36 IN, H 1-10	27289.50
550-1480	170	LF	130.46	STORM DRAIN PIPE, 48 IN, H 1-10	22178.20
550-2150	1200	LF	25.37	SIDE DRAIN PIPE, 15 IN, H 1-10	30444.00
550-2180	350	LF	28.99	SIDE DRAIN PIPE, 18 IN, H 1-10	10146.50
550-2240	250	LF	35.23	SIDE DRAIN PIPE, 24 IN, H 1-10	8807.50
550-2300	180	LF	43.71	SIDE DRAIN PIPE, 30 IN, H 1-10	7867.80
550-3615	124	EA	525.63	SAFETY END SECTION 15 IN, SIDE DRAIN, 6:1 SLOPE	65178.12
550-3618	25	EA	615.24	SAFETY END SECTION 18 IN, SIDE DRAIN, 6:1 SLOPE	15381.00
550-3624	29	EA	780.08	SAFETY END SECTION 24 IN, SIDE DRAIN, 6:1 SLOPE	22622.32
550-3630	16	EA	1954.52	SAFETY END SECTION 30 IN, SIDE DRAIN, 6:1 SLOPE	31272.32
550-3636	6	EA	2795.85	SAFETY END SECTION 36 IN, SIDE DRAIN, 6:1 SLOPE	16775.10
550-3648	5	EA	3368.50	SAFETY END SECTION 48 IN, SIDE DRAIN, 6:1 SLOPE	16842.50
573-2006	3000	LF	17.71	UNDDR PIPE INCL DRAINAGE AGGR, 6 IN	53130.00
576-1018	1000	LF	35.53	SLOPE DRAIN PIPE, 18 IN	35530.00
603-2024	28000	SY	53.68	STN DUMPED RIP RAP, TP 1, 24 IN	1503040.00
603-7000	28000	SY	4.83	PLASTIC FILTER FABRIC	135240.00
668-2100	50	EA	4470.97	DROP INLET, GP 1	223548.50
668-2105	17	EA	4663.90	DROP INLET, GP 1, SPCL DES	79286.30
668-2110	60	LF	294.93	DROP INLET, GP 1, ADDL DEPTH	17695.80
668-5000	2	EA	2040.26	JUNCTION BOX	4080.52
				Section Sub Total:	**$3,973,307.73**

Section PERMANENT EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
700-6910	45	AC	906.91	PERMANENT GRASSING	40810.95

700-7000	90	TN	61.12	AGRICULTURAL LIME	5500.80
700-7010	245	GL	19.30	LIQUID LIME	4728.50
700-8000	30	TN	348.14	FERTILIZER MIXED GRADE	10444.20
700-8100	1900	LB	2.04	FERTILIZER NITROGEN CONTENT	3876.00
716-2000	13000	SY	1.15	EROSION CONTROL MATS, SLOPES	14950.00
				Section Sub Total:	**$80,310.45**

Section TEMPORARY EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	30	AC	571.97	TEMPORARY GRASSING	17159.10
163-0240	680	TN	206.32	MULCH	140297.60
163-0300	30	EA	2872.37	CONSTRUCTION EXIT	86171.10
163-0503	72	EA	558.89	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3	40240.08
163-0520	156	LF	16.16	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	2520.96
163-0530	600	LF	3.67	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	2202.00
163-0531	17	EA	8652.35	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO -	147089.95
165-0010	9600	LF	1.40	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	13440.00
165-0030	11400	LF	1.83	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	20862.00
165-0050	900	LF	4.83	MAINTENANCE OF SILT RETENTION BARRIER	4347.00
165-0060	34	EA	1358.81	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO -	46199.54
165-0070	600	LF	2.29	MAINTENANCE OF BALED STRAW EROSION CHECK	1374.00
165-0087	72	EA	225.17	MAINTENANCE OF SILT CONTROL GATE, TP 3	16212.24
165-0101	30	EA	660.01	MAINTENANCE OF CONSTRUCTION EXIT	19800.30
167-1000	2	EA	1349.35	WATER QUALITY MONITORING AND SAMPLING	2698.70
167-1500	36	MO	1035.76	WATER QUALITY INSPECTIONS	37287.36
170-1000	900	LF	19.00	FLOATING SILT RETENTION BARRIER	17100.00
171-0010	9600	LF	2.03	TEMPORARY SILT FENCE, TYPE A	19488.00
171-0030	11400	LF	3.84	TEMPORARY SILT FENCE, TYPE C	43776.00
				Section Sub Total:	**$678,265.93**

Section SIGNING AND MARKING

Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	700	SF	15.69	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	10983.00
636-1031	300	SF	26.99	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING TP 6	8097.00
636-2080	1500	LF	11.30	GALV STEEL POSTS, TP 8	16950.00
653-0110	10	EA	70.04	THERMOPLASTIC PVMT MARKING, ARROW, TP 1	700.40
653-0120	25	EA	72.67	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	1816.75
653-0170	39	EA	80.60	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	3143.40
653-1501	72000	LF	0.63	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	45360.00
653-1502	72000	LF	0.69	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	49680.00
653-1704	200	LF	5.02	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	1004.00
653-3501	6400	GLF	0.48	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	3072.00
653-3502	500	GLF	0.36	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, YELLOW	180.00
653-6004	850	SY	2.79	THERMOPLASTIC TRAF STRIPING, WHITE	2371.50
653-6006	1250	SY	3.21	THERMOPLASTIC TRAF STRIPING, YELLOW	4012.50
654-1001	400	EA	4.02	RAISED PVMT MARKERS TP 1	1608.00
654-1003	900	EA	4.43	RAISED PVMT MARKERS TP 3	3987.00
				Section Sub Total:	**$152,965.55**

Section BIG CREEK BRIDGE

Item Number	Quantity	Units	Unit Price	Item Description	Cost
000-0000	90	EA	100.00	ELASTOMERIC BEARING	9000.00
500-2100	650	LF	90.00	CONCRETE BARRIER	58500.00
500-3101	550	CY	750.00	CLASS A CONCRETE	412500.00
500-3800	130	CY	896.15	CLASS A CONCRETE, INCL REINF STEEL	116499.50
507-9003	480	LF	145.42	PSC BEAMS, AASHTO TYPE III, BR NO -	69801.60
511-1000	183000	LB	1.00	BAR REINF STEEL	183000.00
520-1125	1500	LF	60.00	PILING IN PLACE, STEEL H, HP 12 X 53	90000.00
524-0010	120	LF	926.22	DRILLED CAISSON -	111146.40
540-1101	1	LS	20000.00	REMOVAL OF EXISTING BR, STA NO -	20000.00
603-2024	260	SY	53.68	STN DUMPED RIP RAP, TP 1, 24 IN	13956.80
				Section Sub Total:	**$1,084,404.30**

Section HART CREEK BRIDGE

Item Number	Quantity	Units	Unit Price	Item Description	Cost
000-0000	40	EA	100.00	ELASTOMERIC BEARING	4000.00
500-2100	360	LF	90.00	CONCRETE BARRIER	32400.00
500-3101	90	CY	750.00	CLASS A CONCRETE	67500.00
500-3800	230	CY	896.15	CLASS A CONCRETE, INCL REINF STEEL	206114.50
507-9002	600	LF	125.98	PSC BEAMS, AASHTO TYPE II, BR NO -	75588.00
507-9003	480	LF	145.42	PSC BEAMS, AASHTO TYPE III, BR NO -	69801.60
511-1000	26000	LB	1.00	BAR REINF STEEL	26000.00
520-1125	450	LF	60.00	PILING IN PLACE, STEEL H, HP 12 X 53	27000.00
524-0010	120	LF	926.22	DRILLED CAISSON -	111146.40
540-1101	1	LS	20000.00	REMOVAL OF EXISTING BR, STA NO -	20000.00
603-2024	260	SY	53.68	STN DUMPED RIP RAP, TP 1, 24 IN	13956.80
				Section Sub Total:	**$653,507.30**

Total Estimated Cost: $24,862,533.00

Subtotal Construction Cost	**$24,862,533.00**
E&C Rate 10.0 %	$2,486,253.30
Inflation Rate 0.0 % @ 0.0 Years	$0.00
Total Construction Cost	**$27,348,786.30**
Right Of Way	$0.00
ReImb. Utilities	$0.00
Grand Total Project Cost	**$27,348,786.30**

Estimate Report for file "BRN-014-1(73)"

Section Big Creek Bridge

Item Number	Quantity	Units	Unit Price	Item Description	Cost
000-0000	90	EA	100.00	ELASTOMERIC BEARING	9000.00
500-2100	650	LF	90.00	CONCRETE BARRIER	58500.00
500-3101	550	CY	750.00	CLASS A CONCRETE	412500.00
500-3800	130	CY	896.15	CLASS A CONCRETE, INCL REINF STEEL	116499.50
507-9003	480	LF	145.42	PSC BEAMS, AASHTO TYPE III, BR NO -	69801.60
511-1000	183000	LB	1.00	BAR REINF STEEL	183000.00
520-1125	1500	LF	60.00	PILING IN PLACE, STEEL H, HP 12 X 53	90000.00
524-0010	120	LF	926.22	DRILLED CAISSON -	111146.40
603-2024	260	SY	53.68	STN DUMPED RIP RAP, TP 1, 24 IN	13956.80
				Section Sub Total:	**$1,064,404.30**

Total Estimated Cost: $1,064,404.30

Subtotal Construction Cost	**$1,064,404.30**
E&C Rate 10.0 %	$106,440.43
Inflation Rate 0.0 % @ 0.0 Years	$0.00
Total Construction Cost	**$1,170,844.73**
Right Of Way	$0.00
ReImb. Utilities	$0.00
Grand Total Project Cost	**$1,170,844.73**

Estimate Report for file "BRN-014-1(74)"

Section Hart Creek Bridge

Item Number	Quantity	Units	Unit Price	Item Description	Cost
000-0000	40	EA	100.00	ELASTOMERIC BEARING	4000.00
500-2100	360	LF	90.00	CONCRETE BARRIER	32400.00
500-3101	90	CY	750.00	CLASS A CONCRETE	67500.00
500-3800	230	CY	896.15	CLASS A CONCRETE, INCL REINF STEEL	206114.50
507-9002	600	LF	125.98	PSC BEAMS, AASHTO TYPE II, BR NO -	75588.00
507-9003	480	LF	145.42	PSC BEAMS, AASHTO TYPE III, BR NO -	69801.60
511-1000	26000	LB	1.00	BAR REINF STEEL	26000.00
520-1125	450	LF	60.00	PILING IN PLACE, STEEL H, HP 12 X 53	27000.00
524-0010	120	LF	926.22	DRILLED CAISSON -	111146.40
603-2024	260	SY	53.68	STN DUMPED RIP RAP, TP 1, 24 IN	13956.80
				Section Sub Total:	**$633,507.30**

Total Estimated Cost: $633,507.30

Subtotal Construction Cost	**$633,507.30**
E&C Rate 10.0 %	$63,350.73
Inflation Rate 0.0 % @ 0.0 Years	$0.00
Total Construction Cost	**$696,858.03**
Right Of Way	$0.00
ReImb. Utilities	$0.00
Grand Total Project Cost	**$696,858.03**

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE EDS-545(40) (53) McDuffie/Wilkes Counties
P.I. No. 222250, 222255

OFFICE Preconstruction

DATE June 21, 1995

FROM H.J. Lively, Jr., P.E., Director of Preconstruction

TO Wayne Shackelford, Commissioner

SUBJECT PROJECT CONCEPT REPORT

This project is the widening of SR 17 from SR 43 to the southern end of the Washington Bypass for a total of 25.6 km. The existing roadway consists of 2-3.6 m lanes with 3.0 m rural shoulders. The existing right-of-way varies from 30.5 m to 61 m. The existing major structures are: (1) Big Creek - 61 m x 10.4 m bridge with a sufficiency rating of 64.7; (2) Hart Creek - 49 m x 10.4 m bridge with a sufficiency rating of 64.7; (3) Little River - 137 m x 10.4 m bridge with a sufficiency rating of 80.0. The base year traffic (1998) is 7800 VPD and the design year traffic (2018) is ~~31,550~~ 13,550 VPD. The posted speed and the design speed is 90 km/h.

Because of the length of this project (25.6 km), it is recommended that the project be divided into two projects. The first project limits would be from SR 43 to CR 6/Smith Mill Road for a total of 9 km. It is recommended that this project be EDS-545(40) McDuffie County, P.I. No. 222250.

The second project would extend from CR 6/Smith Mill Road to the Washington Bypass for a total of 16.6 km. It is recommended that the project be EDS-545(53) McDuffie/Wilkes Counties, P.I. No. 222255. The unit number and P.I. Number would be determined by the Office of Programming.

EDS-545(40) McDuffie County

The proposed construction will provide 4-3.6 m lanes with a 13.4 m depressed grassed median for the entire project length. The proposed right-of-way varies from 46 m to 76 m. New 11.6 m wide parallel bridges will be constructed over Big Creek and Hart Creek and the existing bridges will be widened to 11.6 m. Approximately 60% of the existing roadway will require reconstruction. This roadway will remain open to traffic during construction.

EDS-545(40) (53) McDuffie/Wilkes Counties

EDS-545(53) McDuffie/Wilkes Counties

The proposed construction will provide 4-3.6 m lanes with a 13.4 m depressed grassed median for the entire project length. Because of adverse horizontal and vertical conditions and to avoid historic resources, the alignment would bypass Aonia to the west on new location and cross existing SR 17 to the north of Aonia. The alignment would continue on new location east of and parallel to SR 17 to the Washington Bypass. Access would be regulated by permit along the existing roadway and partial limited along the portion on new location. The proposed right-of-way varies from 64 m to 76 m. A new parallel 137 m x 11.6 m bridge will be constructed over Little River and the existing bridge will be widened to 11.6 m. The existing roadway will remain open to traffic during construction.

Environmental concerns for both projects include requiring a COE 404 permit; 1.21 hectares of hydric soils impacted; an Environmental Assessment Report will be prepared; 9 displacements - 5 businesses, 4 residences; a public hearing will be held; time saving procedures are not appropriate.

The estimated costs for these projects are:

	PROPOSED EDS-545(40)	PROPOSED EDS-545(X)	APPROVED	PROG. DATE
Constr(Infl&E/C)	$7,488,000	$16,643,000	$13,400,000	1999
Right-of-way	$2,015,000	$3,005,000	$1,594,000	99-10
Utilities*	$94,000	$45,000	---	

*LGPA sent 3-23-92 requesting Wilkes County do utilities; McDuffie County signed LGPA for utilities on 5-7-92.

These projects are part of the Governor's Road Improvement Program. I recommend these project concepts be approved.

HJL/JDQ/se

CONCUR: Frank Danchetz
Frank Danchetz, P.E., Chief Engineer

APPROVED: Wayne Shackelford
Wayne Shackelford, Commissioner

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE EDS-545(40) MCDUFFIE-WILKES
P.I. NO. 222250
EDS-545(53) MCDUFFIE-WILKES
P.I. No. 222255

OFFICE Atlanta, Georgia

DATE JUNE 29, 1995

FROM Bob Mustin, P.E., Project Review Engineer DTM

TO C. Wayne Hutto, Assistant Director of Preconstruction

SUBJECT PROJECT CONCEPT REPORT

The concept report submitted June 16, 1995 been reviewed and is considered satisfactory.

The estimated costs for the project are as follows:

	545(40) PART 1	545(53) PART 2
Construction	$ 6,174,000	$ 13,723,000
Inflation	$ 617,000	$ 1,372,000
E & C	$ 697,000	$ 1,548,000
Right of Way	$ 2,015,000	$ 3,005,000
Reimbursable Utilities	$ 93,800	$ 45,000

DTM

c: David Studstill

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ENVIRONMENT/LOCATION

PROJECT CONCEPT REPORT

EDS-545(40)(53)
McDUFFIE/WILKES COUNTIES
P.I. NO. 222250/222255

Federal Route No.: F-14-1
State Route No.: 17

Date of Report: June 15, 1995

RECOMMENDATION FOR APPROVAL

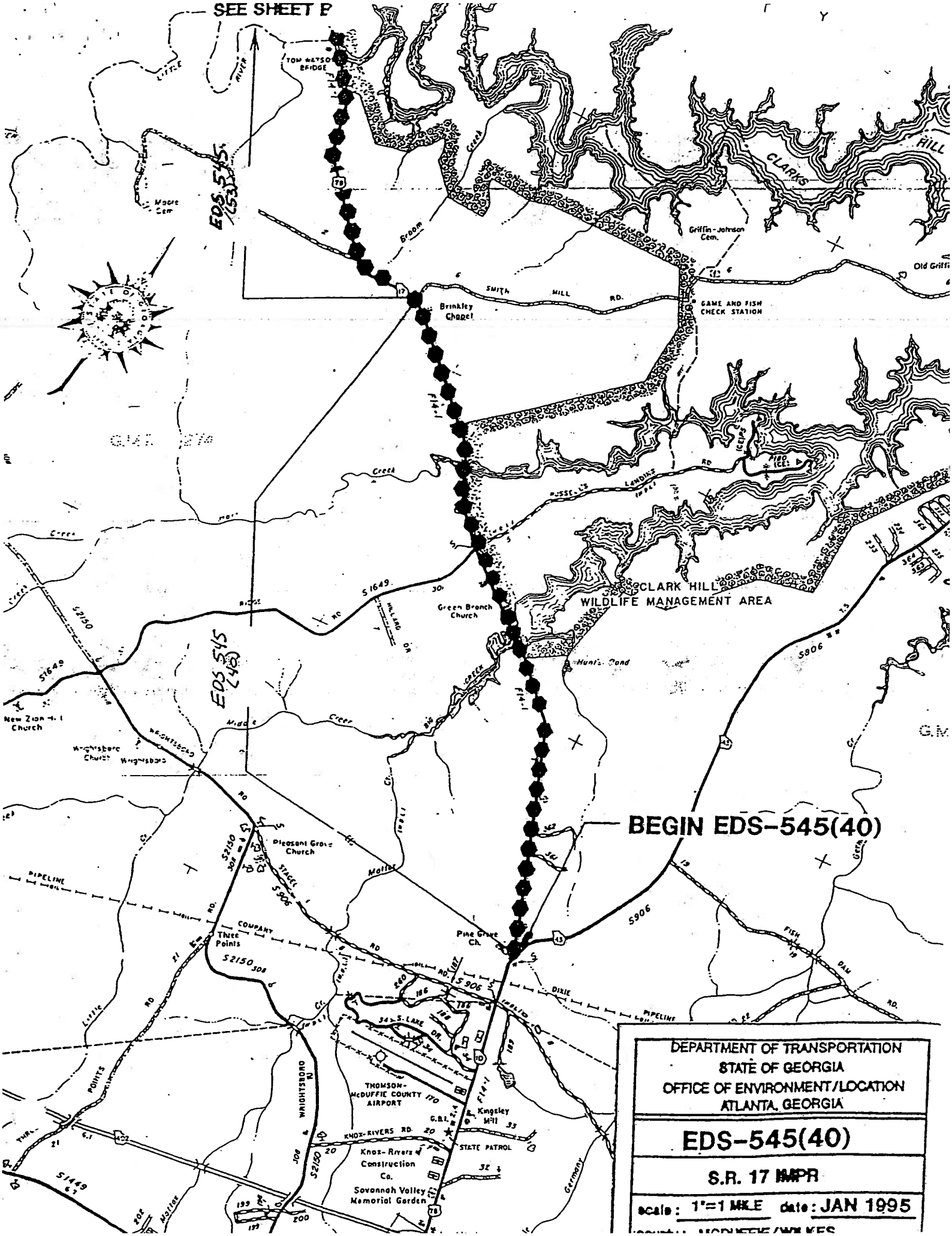
6/16/95 — O. L. E. Mitchell Jr.
Date — State Environmental/Location Engineer

Date — State Road & Airport Design Engineer

Date — State Traffic Operations Engineer

Date — District Engineer - TENNILLE

Date — State Bridge & Structural Engineer

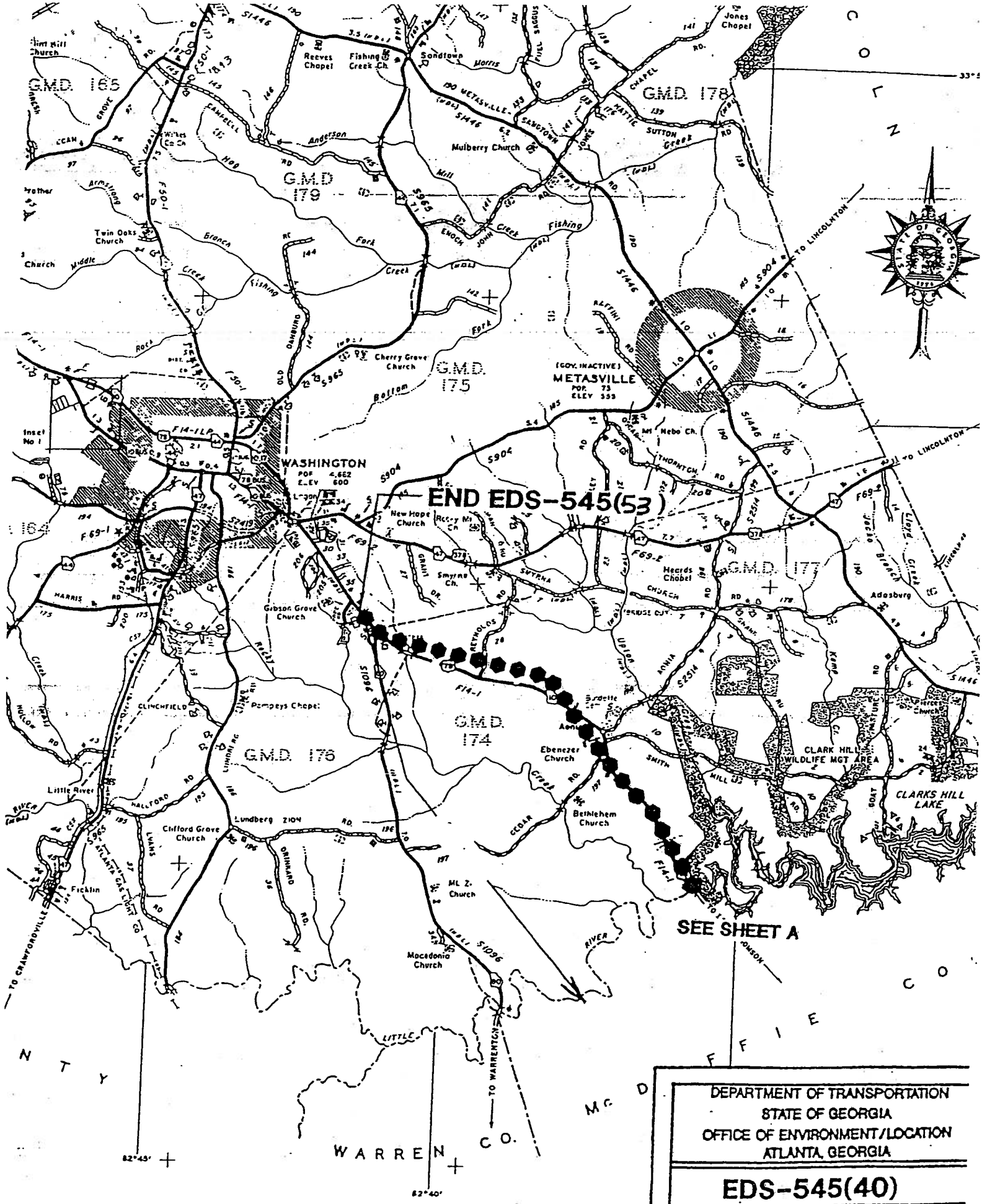


DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ENVIRONMENT/LOCATION
ATLANTA, GEORGIA

EDS-545(40)

S.R. 17 IMPR

scale: 1"=1 MILE date: JAN 1995



DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ENVIRONMENT/LOCATION
ATLANTA, GEORGIA

EDS-545(40)

S.R. 17 ~~HPR~~

scale: 1"=2 ~~MILE~~ date: JAN 1995

PROJECT CONCEPT REPORT

EDS-545 (53)
PROJECT NUMBER: EDS-545(40)McDuffie/Wilkes

PROJECT LOCATION AND DESCRIPTION

Project EDS-545(40) (53) is the widening of S.R. 17 from the S.R. 43 connector to the southern end of the Washington By-Pass for a distance of approximately 25.6 km. The widening would begin on the western side,using a typical section of four 3.6 m lanes with a 13.6 m grassed median, from the S.R. 43 connector to a point 0.427 km east of C.R. 301 relocation where the widening would shift to the eastern side of S.R. 17 and continue to a point of 0.487 km east of C.R. 6/Smith Mill Rd. The widening would then shift to the western side and continue to a point approximately 2.8 km north of the Little River. There, the widening would shift back to the northeastern side until a point 0.457 km south of C.R. 197. The widening would continue on new location to the northwest of Aonia, using a four 3.6 m lane section with a 13.6 m grassed median for approximately 1.1 km, crossing back over S.R. 17 north of S.R. 198 and continuing on new location to the north of S.R. 17 to a point just south of S.R. 80. At this point, the widening would shift to the west side and extend to the Washington By-Pass. The existing bridges at Big Creek, Hart Creek and the Little River are to be widened and new ones built parallel to the existing bridges. Required R/W varies from 46 m to 76 m. The speed design is 90 kph.

TRAFFIC

CURRENT		PROJECTED	
YEAR	AADT	YEAR	AADT
1998	7800	2018	13550

PDP CLASSIFICATION	FUNCTIONAL CLASSIFICATION
MAJOR / EXISTING	RURAL ARTERIAL

NON-CA ( ) CA ( ) N/A (X) EXEMPT ( )

NEED AND PURPOSE

The S.R 17 Improvements are part of the Governors Road Improvement Program(G.R.I.P.) and involves the multi-laning of this primary north-south corridor in east Georgia, serving as a catalyst for the development of this region. The improvements will aid in the economic development of sparsly populated rural areas and small towns along this route. Traffic carrying capacity will be increased and safety and operational characteristics along this segment will be improved.

EXISTING ROADWAY

TYPICAL SECTION:	2 - 3.6 m lanes with 3 m shoulders-rural	R/W WIDTH 30.5 m - 61 m
POSTED SPEED	MINIMUM RADIUS OF CURVE	MAX GRADE
90 kph	555 m	5.0%

MAJOR STRUCTURES

FEATURES INTERSECTED/TYPE	LENGTH	WIDTH	PRIORITY RATING	SUFF. RATING
Big Creek - Continous Steel Stringer bridge	61m	10.4 m	2096	64.7
Hart Creek - Continuous Steel Stringer bridge	49 m	10.4 m	2143	64.7
Little River - Continuous Steel Stringer bridge	137 m	10.4 m	2275	80.0

RECOMMENDATION

Because of its 25.6 km length, it is recommended that this project be divided into 2 parts. Part 1 would begin at the S.R. 43 connector and continue to C.R. 6/Smith Mill Rd. for a distance of approximately 9 km. Part 2 would begin at C.R. 6/Smith Mill Rd. and continue to the southern termini of the Washington By-pass for a distance of approximately 16.6 km.

PROPOSED ROADWAY (PART 1)

TYPICAL SECTION:	4-3.6 m lanes w/13.6 m depressed grassed median rural			
DESIGN SPEED	MINIMUM RADIUS OF CURVE		MAX GRADE	
90 kph	ALLOWABLE	275m Radius	ALLOWABLE	5.0 %
	PROPOSED	875 m Radius	PROPOSED	4.5 %

MAJOR STRUCTURES

FEATURES INTERSECTED/TYPE	LENGTH	WIDTH
Big Creek (Widen Existing Bridge & Build 1 New Bridge)	61 m	11.6 m
Hart Creek (Widen Existing Bridge & Build 1 New Bridge)	49 m	11.6 m

PROPOSED RIGHT-OF-WAY

RIGHT-OF WAY WIDTH	PARCELS IMPACTED	DISPLACEMENTS
Varies 46 m to 76 m	36	BUS.: 3 RES.: 3 M.H.: 1

TYPE OF ACCESS CONTROL: By permit/partial limited

ESTIMATED COST (PART 1)

CONSTRUCTION:	$ 6,174,000	RIGHT-OF-WAY:	$ 2,015,000
E & C (10%):	$ 617,000	ACQUIRED BY:	D.O.T.
INFLATION:	$ 697,000	UTILITIES:	$ 93,800
(2 yrs at 5% per yr):		ADJUSTED BY:	LGPA & D.O.T.
TOTAL CONS'T COST:	$ 7,488,000		

PROPOSED ROADWAY (PART 2)

TYPICAL SECTION:	4-3.6 m lanes w/13.6 depressed grassed median - rural			
DESIGN SPEED	MINIMUM RADIUS OF CURVE		MAX GRADE	
90 kph	ALLOWABLE	275m Radius	ALLOWABLE	5.0 %
	PROPOSED	555m Radius	PROPOSED	3.0%

MAJOR STRUCTURES

FEATURES INTERSECTED/TYPE	LENGTH	WIDTH
Little River - (Widen existing bridge & build 1 new bridge)	137m	11.6 m

PROPOSED RIGHT-OF-WAY

RIGHT-OF-WAY WIDTH	PARCELS IMPACTED	DISPLACEMENTS
Varies 64m to 76 m	42	BUS.:2 RES.:1 M.H.:0

TYPE OF ACCESS CONTROL: By permit/partial limited

ESTIMATED COST (PART 2)

CONSTRUCTION:	$ 13,723,000	RIGHT-OF-WAY:	$ 3,005,000
E & C (10%):	$ 1,372,000	ACQUIRED BY:	D.O.T.
INFLATION:	$ 1,548,000	UTILITIES	$ 45,000
(2 yrs at 5% per yr):		ADJUSTED BY:	LGPA & D.O.T.
TOTAL CONS'T COST:	$ 16,643,000		

COORDINATION

CONCEPT TEAM MEETING DATE:	May 11, 1994
ENVIRONMENTAL CONCERNS	None
PERMITS REQUIRED:	C.O.E. 404 (Approx. 0.15 hectares wetlands -PART 1) (Approx. 1.06 hectares wetlands- PART 2)
LEVEL OF PUBLIC INVOLVEMENT:	Public Hearing to be scheduled
TIME SAVING PROCEDURES APPROPRIATE:	NO
OTHER PROJECTS IN THE AREA:	EDS-545(40)McDuffie/Wilkes,EDS-545(47)Wilkes, EDS-545(13)Wilkes, EDS-545(46)McDuffie, EDS-545(3)McDuffie

MISCELLANEOUS

TRAFFIC CONTROL DURING CONSTRUCTION:	Maintain existing one lane in each direction
LEVEL OF ENVIRONMENTAL ANALYSIS:	Environmental Assessment Report
UNDERGROUND STORAGE TANKS:	1 possible: investigation requested.
HAZARDOUS WASTE SITES:	None known at this time;investigation requested.

DESIGN VARIATIONS REQUESTED:

	YES	NO	UNDETERMINED
SUBST HORIZ ALIGNMENT	( )	(X)	( )
SUBST ROADWAY WIDTH	( )	(X)	( )
SUBST SHOULDER WIDTH	( )	(X)	( )
SUBST VERTICAL GRADES	( )	(X)	( )
SUBST CROSS SLOPES	( )	(X)	( )
SUBST STOPPING SIGHT DIST	( )	(X)	( )
SUBST SUPERELEV RATES	( )	(X)	( )
SUBST HORIZONTAL CLEARANCE	( )	(X)	( )
SUBST SPEED DESIGN	( )	(X)	( )
SUBST VERTICAL CLEARANCE	( )	(X)	( )
SUBST BRIDGE WIDTH	( )	(X)	( )
SUBST BR STRUCT CAPACITY	( )	(X)	( )

ALTERNATIVES CONSIDERED

1. No build.
2. A widening alternative was considered through Aonia GA. to the Washington By-pass. This recommended alternative impacts several historical properties along S.R. 17.

COMMENTS

1. Approximately 58% of this project requires vertical reconstruction.
2. This alignment has not been through the 404-B(1) guideline process with the Federal resource agencies and is subject to change.

ATTACHMENTS: COST ESTIMATE, TYPICAL SECTIONS, TEAM MEETING MINUTES

PREPARED BY: Cindy VanDyke, T.E. II

PRELIMINARY COST ESTIMATE

OFFICE OF ENVIRONMENT/LOCATION

P.I. NO: 222255

DATE: 06-15-1995

PROJECT NO: EDS-545(53)

PROJECT NAME: S.R. 17 IMPROVEMENTS

COUNTY: MCDUFFIE/WILKES

PROJECT DESCRIPTION: FROM THE S.R. 43 CONNECTOR TO THE WASHINGTON BY-PASS SECTION 2

PROJECT LENGTH: 10.200 MILES

SECTION LENGTH: 7.100 MILES

TYPICAL SECTION:
RURAL NEW LOCATION-4-LANES WITH 44' DIV MEDIAN (48' PAV'T)
Minimum R/W = 150 ft

EXISTING ROADWAY (If Applicable): S.R. 17

TRAFFIC:

INITIAL DESIGN YEAR: 1998 DAILY VOLUME (AADT): 7,800

FINAL DESIGN YEAR: 2018 DAILY VOLUME (AADT): 13,550

( )FEASIBILITY STUDY ( )PRE-PROGRAMMING PROCESS (X)PROGRAMMING PROCESS

COMMENTS: EDS-545(40) HAS BEEN DIVIDED INTO 2 SECTIONS. SECTION 1 IS FROM THE S.R.43 CONN. TO C.R. 6. SECTION 2 IS FROM C.R. 6 TO THE WASHINGTON BY-PASS.

PREPARED BY: CLV

PROJECT COSTS

A. RIGHT-OF-WAY

1. PROPERTY (Land and Easements)	$ 1,237,000
2. DISPLACEMENTS	$ 421,000
3. OTHER COST	$ 1,347,000
SUBTOTAL	$ 3,005,000

B. REIMBURSABLE UTILITIES

1. RAILROAD	$ 0
2. TRANSMISSION LINES	$ 0
3. SERVICES	$ 45,000
SUBTOTAL	$ 45,000

C. MAJOR STRUCTURES

1. WALLS	$ 0
2. BRIDGE STREAM CROSSING LITTLE RIVER	$ 1,026,225
3. BRIDGE OVER/UNDERPASS	$ 0
4. BOX CULVERTS ROCK CREEK TRIB.	$ 98,000
SUBTOTAL	$ 1,124,000

D. GRADING AND DRAINAGE

1. EARTHWORK	
a. UNCLASSIFIED EXCAVATION SOIL 527,530 CY @ $1.37	$ 725,000
b. UNCLASSIFIED EXCAVATION ROCK 0 CY @ $4.00	$ 0
c. BORROW EXCAVATION 367,000 CY @ $2.41	$ 884,000
2. DRAINAGE	
a. MINOR DRAINAGE (INCLUDING CROSS DRAIN PIPES & LONGITUDINAL SYSTEM) 7.100 MILES @ $82,080	$ 583,000
b. CURB AND GUTTER 0 LF @ $8.06	$ 0
SUBTOTAL	$ 2,192,000

PROJECT COSTS
con't.

E. BASE AND PAVING

1. GRADED AGGREGATE BASE — $ 1,580,000
   10.00" -- 137,956 T @ $11.45

2. ASPHALT PAVING
   a. ASPHALTIC CONCRETE "E" — $ 653,000
      1.50" -- 21,556 T @ $30.31
   b. ASPHALTIC CONCRETE "B" — $ 900,000
      2.00" -- 28,741 T @ $31.31
   c. ASPHALTIC CONCRETE BASE — $ 1,038,000
      3.00" -- 34,489 T @ $30.09
   d. BITUMINOUS TACK COAT — $ 15,000
      19,029 G @ $0.80

3. CONCRETE PAVING — $ 0

4. OTHER PAVING — $ 419,000

SUBTOTAL $ 4,605,000

F. LUMP ITEMS

1. TRAFFIC CONTROL — $ 15,000

2. CLEARING AND GRUBBING — $ 607,000
   129 ACRES @ $4,700

3. LANDSCAPING — $ 362,000
   7.100 MILES @ $51,000

4. EROSION CONTROL — $ 341,000
   7.100 MILES @ $48,000

5. DETOURS (INCL. TEMP. BRIDGES) — $ 0

SUBTOTAL $ 1,325,000

G. MISCELLANEOUS

1. SIGNING/STRIPING — $ 263,000
   7.100 MILES @ $37,000

2. GUARDRAIL — $ 18,000
   960 LF @ $11.85 + 8 Anchors @ $912.63

3. OTHER — $ 1,144,000
   7.100 MILES @ $161,100

SUBTOTAL $ 1,425,000

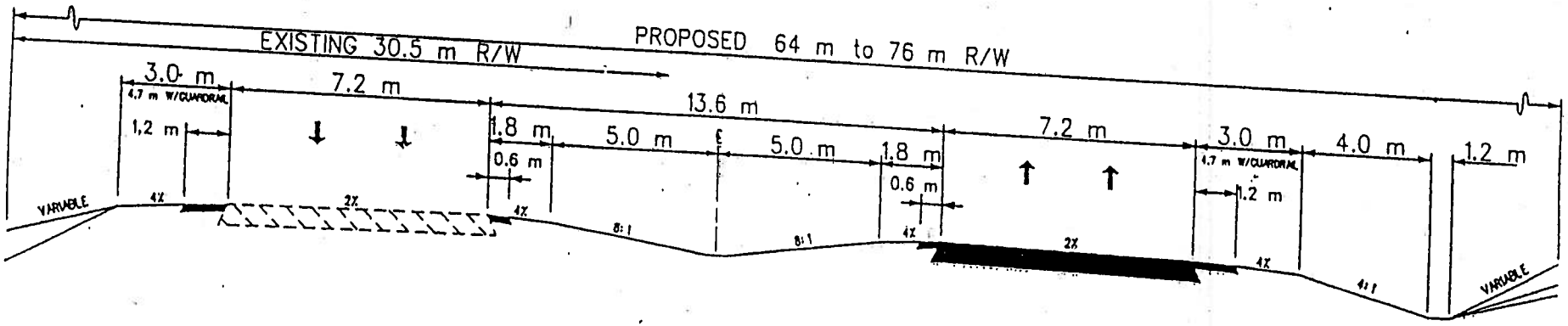
ESTIMATE SUMMARY

		SECTION COST (per mile)
A. RIGHT-OF-WAY	$ 3,005,000	$ 423,000
B. REIMBURSABLE UTILITIES	$ 45,000	$ 6,000

CONSTRUCTION COST SUMMARY

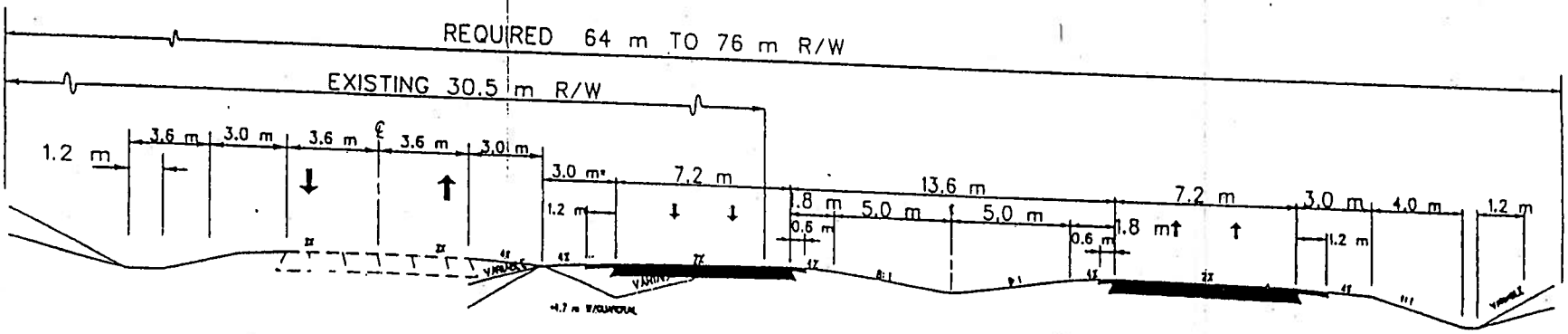
C. MAJOR STRUCTURES	$ 1,124,000	
D. GRADING AND DRAINAGE	$ 2,192,000	
E. BASE AND PAVING	$ 4,605,000	
F. LUMP ITEMS	$ 1,325,000	
G. MISCELLANEOUS	$ 1,425,000	
H. SPECIAL FEATURES	$ 3,052,000	
SUBTOTAL CONSTRUCTION COST	$ 13,723,000	$ 1,933,000
E. & C. (10%)	$ 1,372,000	
INFLATION...2 yr(s) @ 5% per year	$ 1,548,000	
TOTAL CONSTRUCTION COST	$ 16,643,000	$ 2,344,000
GRAND TOTAL CONSTRUCTION COST	$ 19,693,000	$ 2,774,000

IRAL NEW LOCATION-4-LANES WITH 44' DIV MEDIAN (48' PAV'T)



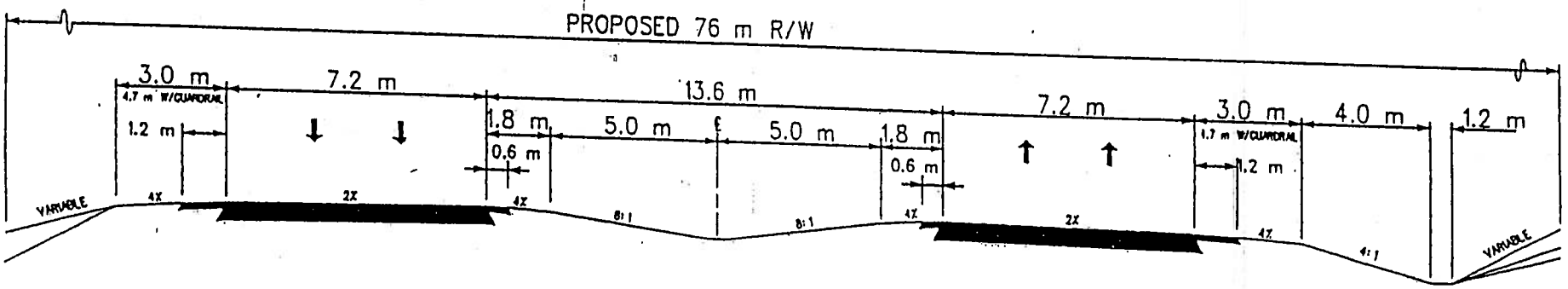
TYPICAL CROSS SECTION
S.R. 17 IMPROVEMENTS
EDS-545(53) PART 2 McDUFFIE/WILKES COUNTIES

NOT TO SCALE



TYPICAL CROSS SECTION
S.R. 17 IMPROVEMENTS
EDS-545(53) PART 2 McDUFFIE/WILKES COUNTIES

NOT TO SCALE



TYPICAL CROSS SECTION
S.R. 17 IMPROVEMENTS
EDS-545(53) PART 2 McDUFFIE/WILKES COUNTIES

NOT TO SCALE

545T8

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF CONSULTANT DESIGN

PRELIMINARY RIGHT OF WAY AND CONSTRUCTION COST ESTIMATE

Project Number: EDS-545 (53)
County: McDUFFIE / WILKES
P. I. Number: 222255

Federal Route Number: 78
State Route Number: S.R. 17/S.R. 10

APPENDIX B

PRELIMINARY COST ESTIMATE

PROJECT NUMBER: EDS-545 (53) **COUNTY:** McDUFFIE/WILKES

DATE: 4/10/02 **ESTIMATED LETTING DATE:** UNKNOWN

PREPARED BY: Clark Patterson Associates **PROJECT LENGTH (MILES):** 9.70

( )PROGRAMMING PROCESS ( )CONCEPT DEVELOPMENT (X)DURING PROJECT DEV.

PROJECT COST	
A. RIGHT-OF-WAY:	
1. PROPERTY (LAND & EASEMENT)	$ 1,741,000
2. DISPLACEMENTS; RES:0, BUS;0, M.H.:0	$ 592,000
3. OTHER COST (ADM./COST, INFLATION)	$ 1,895,000
SUBTOTAL:A	$ 4,228,000
B. REIMBURSABLE UTILITIES	
1. RAILROAD	$ 0
2. TRANSMISSION LINES	$ 63,000
3. SERVICES	$ 0
SUBTOTAL:B	$ 63,000
C. CONSTRUCTION:	
1. MAJOR STRUCTURES	$ 0
a. RETAINING WALLS	$ 0
b. BRIDGES	$ 1,444,000
c. DETOURS BRIDGES	$ 0
d. BOX CULVERTS	$ 1,380,000
SUBTOTAL:C-1	$ 2,824,000
2. GRADING AND DRAINAGE:	
a. EARTHWORK	$ 1,800,000
b. DRAINAGE:	
1) Cross Drain Pipe (exclude box culverts)	$ 725,000
2) Curb and Gutter	$ 0

PROJECT COST		
3) Longitudinal System(include catch basins)		0
SUBTOTAL:C-2		$ 2,525,000
3. BASE AND PAVING:		
a. AGGREGATE BASE (10.00'') 177,500 T @ $21.48		$ 3,813,000
b. ASPHALT PAVING:		
Surface 27,268 T @ $35.93	$ 980,000	
Binder 33,100 T @ $40.99	$ 1,357,000	
Base 39,200 T @ $37.84	$ 1,483,000	
SUBTOTAL:C-3.b		$ 3,820,000
c. CONCRETE PAVING		$ 0
d. OTHER (TACK COAT, LEVELLING)		$ 331,000
SUBTOTAL:C-3		$ 7,964,000
4. LUMP ITEMS:		
a. TRAFFIC CONTROL		$ 50,000
b. CLEARING AND GRUBBING 230 acres @ $5,000.00		$ 1,150,000
c. LANDSCAPING		$ 0
d. EROSION CONTROL 120 acre @ $2,500.00		$ 300,000
e. DETOURS		$ 0
SUBTOTAL:C-4		$ 1,500,000
5. MISCELLANEOUS:		
a. LIGHTING		$ 0
b. SIGNING - STRIPING - SIGNAL		$ 370,000
c. GUARDRAIL		$ 26,000
d. BRIDGE REMOVAL		$ 50,000
SUBTOTAL:C-5		$ 113,000
6. SPECIAL FEATURES_____SUBTOTAL:C-6		$ 4,294,000

ESTIMATE SUMMARY			
A. RIGHT-OF-WAY			$ 4,228,000
B. REIMBURSABLE UTILITIES			$ 63,000
C. CONSTRUCTION			
1. MAJOR STRUCTURES	$	2,824,000	
2. GRADING AND DRAINAGE	$	2,525,000	
3. BASE AND PAVING	$	7,964,000	
4. LUMP ITEMS	$	1,500,000	
5. MISCELLANEOUS	$	113,000	
6. SPECIAL FEATURES	$	4,294,000	
SUBTOTAL CONSTRUCTION COST	$	19,220,000	
E. & C. (10%)	$	1,922,000	
INFLATION (5% PER YEAR)	$	1,970,000	
NUMBER OF YEARS 2			
TOTAL CONSTRUCTION COST			$ 23,113,000
GRAND TOTAL PROJECT COST			$ 27,404,000

PRELIMINARY FIELD PLAN REVIEW INSPECTION REPORT

PROJECT NUMBER: EDS-545(40), McDuffie County
PI No.: 222250
SR 17 Widening

INSPECTION DATE: January 18, 2007
REPORT DATE: February 7, 2007

This inspection was requested by Mohammed Abubakari, State Consultant Design Engineer. The Project Manager is Thomas Cox.

The plans were prepared by Stantec.

This report was prepared by David Zoeckler, Design Review Engineer, and approved by Brian Summers, Project Review Engineer, Office of Engineering Services.

The NEPA document was approved on December 7, 1999.

This report is being distributed via E-mail.

All comments marked with an arrow symbol, ⇒, should be addressed with a written response by the Project Manager.

This project will require the use of the 2004 AASHTO "GREEN BOOK" and the 2001 Georgia Standard Specifications. Please revise all notes that make reference to previous GA DOT Design Manuals and specifications and ensure that all design is done in accordance with current policy.

PROJECT DESCRIPTION

This 6.7 mile project consists of the widening of SR 17 from SR 43 to CR 6 / Smith Mill Road. SR 17 will be widened from a rural two lane roadway to a rural four lane roadway with a 44 foot wide depressed grassed median. The Project also includes construction of two bridges over Big Creek and Hart Creek. The roadway will remain open to traffic during construction. This project is currently scheduled to be let in May 2009.

DESIGN DATA

CURRENT TRAFFIC ADT: 7800 (1998)

DESIGN TRAFFIC ADT: 13550 (2018)

⇒ It is recommended that the Current ADT and Design ADT data be updated. The current ADT should normally be the "Base Year" as defined in Chapter 13 of the GDOT Design Manual (base year is the year the project is anticipated to be open to traffic). In accordance with the GDOT Design Manual, the design year is the anticipated future life of the project and for all GDOT projects the future traffic volumes will be 20 years from the base year. In the case of this project the current or base ADT should be for 2012 and the Design ADT is required to be for 2038.

Stantec will apply a growth factor and revise cover sheet accordingly.

PERCENT TRUCKS: 17%

CURRENT POSTED SPEED: 55 MPH

SPEED DESIGN: 65 MPH

FUNCTIONAL CLASSIFICATION: Rural Arterial

ENVIRONMENTAL

LEVEL OF ENVIRONMENTAL ANALYSIS: Environmental Assessment – Finding of No Significant Impacts approved on December 7, 1999.

PERMITS REQUIRED: Individual Section 404 Permit will be required – In progress

UNDERGROUND STORAGE TANKS: N/A

HAZARDOUS WASTE SITE(S): N/A

HISTORICAL SITE(S): Pinehall Fire Tower (#1), Burdette Barn (#11), Dyar Property (#14), Thomson Property (#15), Fernacres Farm (#16), Madden Property (#19(, and Property # 20.

PARKLAND: N/A

ARCHAEOLOGICAL SITE(S): N/A

AIR/NOISE: N/A

STREAM/WETLAND MITIGATION/RESTORATION: N/A

ENDANGERED SPECIES: N/A

ENVIRONMENTAL MONITORING REQUIRED: N/A

ENVIRONMENTAL COMMITMENTS:

COMMITMENT / REQUIREMENT	DOCUMENT STIPULATED IN	RESPONSIBLE OFFICE	PLACE ON PLANS?	REQUIRES A SPECIAL PROVISION?	STATUS
Pre-Construction Commitments					
An Individual Section 404 Permit will be obtained prior to project implementation.	EA/FONSI	OEL	No	No	Incomplete
All unavoidable stream and wetland impacts will be mitigated at an USACOE approved mitigation bank.	EA/FONSI	OEL	No	No	Incomplete
Prior to project implementation data recovery of archaeological site 9MF38 will	MOA	OEL	No	No	Incomplete

occur					
During Construction Commitments					
None identified					
Post Construction Commitments					
None identified					

GENERAL ENVIRONMENTAL COMMENTS: None

RIGHT OF WAY

NUMBER OF PARCELS: 57 Appraised: 0

ACQUIRED DEEDS: None

ACQUISITION BY: District Right of Way

TYPE ACCESS CONTROL: Access Permit

GENERAL RIGHT OF WAY COMMENTS: See comments under other sections of this report as they may affect required Right of Way or Easements.

DESIGN EXCEPTIONS

⇒ DESIGN EXCEPTIONS REQUIRED: See comments in the construction plan section of this report regarding speed designs for side roads as they relate to geometric design requirements. The Project Manager is advised to verify the necessary speed design for the side roads and to provide necessary geometric design revisions as necessary to meet the necessary speed designs, or request the appropriate design exceptions.

DESIGN EXCEPTIONS REQUESTED: None

DESIGN EXCEPTIONS APPROVED: None

DESIGN VARIANCES

⇒ DESIGN VARIANCES REQUIRED: Substandard distance between median openings; median openings between CR 361 and CR 362 are 977 feet apart, GDOT policy specifies a minimum distance of 1320 feet between median openings in rural sections.

Stantec will request a variance for Speed Design on CR361, CR362, CR5, CR301, CR6.

DESIGN VARIANCES REQUESTED: None

DESIGN VARIANCES APPROVED: None

SPECIAL PROVISIONS

SPECIAL PROVISIONS FURNISHED FOR THE INSPECTION:

Section 107.23.G – Protection of Federally Protected Environmentally Sensitive Species (Bald Eagle, and Barn or Cliff Swallows
Section 149 – Construction Layout
Section 205 – Roadway Excavation

ADDITIONAL SPECIAL PROVISIONS REQUIRED:

⇒ It is requested that the Special Provision 150.11 be provided that specifies that no lane closures will be allowed during the week of the Master's Golf Tournament.

Stantec will include Special Provision 150.11.

GENERAL SPECIAL PROVISION COMMENTS:

Contracts Administration should include the Special Provision adding the Fine Grader.

No Restrictive working hours are specified for this project.

ESTIMATED CONTRACT TIME: 36 Months

PLANS

⇒ The Project Manager is advised that the bridges for this project are separate projects and as such must have their own separate stand alone plan sets. As presented for the PFPR, the preliminary bridge plans were assembled into the plan set for project EDS-545(40).

Stantec will add Bridge Project numbers to Cover sheet.

⇒ The Project Manager is advised to ensure that the various plan sections of the plan set are correctly identified in the title boxes and that the plan sheets are correctly numbered by section number in accordance with the PPG.

Stantec will re-number plan sheets in accordance to September 15, 2006 EDG.

COVER SHEET/INDEX:

⇒ It is requested that the applicable beginning and end mileposts be added to the project sketch on the cover sheet.

Stantec will add mileposts to the cover sheet.

TYPICAL SECTIONS:

⇒ As provided for the PFPR review, Typical Sections 2, 5, and 6 indicate areas throughout the project where the existing SR 17 roadway will be retained and leveled; however, this is not reflected in the plans or cross sections which show full depth full width reconstruction. Typical Section 1 indicates areas where existing pavement is to be retained and widened; however, this is not reflected in the plans or cross sections. As discussed in the PFPR meeting, it was understood that the plans had apparently been revised after the pavement evaluation recommended replacement of the existing pavement. It is requested that the Project Manager ensure that the typical sections are revised as necessary to accurately reflect these changes.

Stantec will revise typical sections.

⇒ The PFPR review team was uncertain about the intended meaning for noting on the Typical Sections that "Applicable Stationing based on the number of lanes". It is requested that the Typical Sections be provided for a mainline tangent section, superelevated section, and a median opening turn lane and side street deceleration lane section.

Stantec will revise typical sections and add superelevated sections, median opening turn lane sections, and deceleration lane sections.

⇒ The Typical Sections appear to show the center turn lanes being constructed with a 2% crown in the middle of the lane, these turn lanes should be provided with a single cross slope.

Stantec will revise typical sections and cross sections to illustrate cross slope changes at lane edges, not in the middle of lanes.

⇒ The "varies" dimension for the center turn lane on Typical Section 5 and 6 is incorrect. These lanes should be centered 6 feet on both sides of the centerline.

The "varies" dimension corresponds to left-turn lane tapers. The turn lanes are centered about the centerline as suggested. No action required.

⇒ The Project Manager is advised that many of the Station Ranges provided for Typical Section 6 are actually located in the middle of the median openings and therefore should show a full depth pavement section across the entire section instead of the depressed grassed median.

Stantec will revise typical sections accordingly.

⇒ It is requested that Typical Section 7 representing the bridge typical sections be deleted.

Stantec will remove the bridge typical section.

⇒ It is requested that the leveling course be deleted from Typical Section 8; however, it is requested that leveling remain set up in the Summary of Quantities and Detailed Estimate but noted, as directed by the Engineer.

Stantec will remove leveling from typical sections, but list it in the Summary of Quantities and Detailed Estimate.

⇒ It is requested that the required pavement courses be indicted on each side of the typical section including the paved shoulders.

Stantec will revise typical sections accordingly.

⇒ It is requested that the course F description be revised to read "Indentation Rumble Strip per GDOT Detail S-8".

Stantec will revise typical sections accordingly.

⇒ It is requested that a detail for the placement of rock embankment to a height of 1.5 feet above the water level of any inundated fill sections be added to the plans. Possible areas identified in the Soil Survey Summary report included Station 26+00 LT, 39+00 RT, 142+00 to 147+00 LT and RT, 209+50 RT, and 224+00 to 228+00 LT and RT.

Riprap details for bridge embankments are provided with the bridge layouts. No action required.

⇒ It is requested that the driveway detail be amended to specify that all driveways (including earth or gravel) are to be paved to the Right of Way or tie-in point whichever is further. That the driveways be provided as 14 feet to 16 feet wide for residential, 20 feet wide for farm use, 24 feet wide for commercial, and 24 feet wide for country roads. It is requested that commercial driveways and country roads be provided with 35 foot tie in radii. It is requested that all references to aggregate surface course be deleted since all driveways are to be paved.

Stantec will revise plans to illustrate requested dimensions. All references to aggregate surface course will not be deleted as dirt driveways shall be constructed with aggregate surface course beyond right-of-way limit. Notes and details will be revised to inform the contractor of locations of aggregate surface course.

⇒ It is requested that the Shoulder Detail for Guardrail be amended to provide for GAB and paving from the edge of the paved shoulder to behind the guardrail, and that asphalt curbing and spillways be provided at the top of the fill slopes behind any guardrail sections. It is also requested that the specified guardrail height be deleted from this detail.

Stantec will revise plans accordingly.

GENERAL NOTES:

⇒ It is requested that the Project Manager verify that the Utility Owners Contact box provided in the General Notes has been updated in accordance with the information provided in the Utilities section of this report.

Stantec will revise plans accordingly.

⇒ The current Call Before You Dig utility relocation logo needs to be added to the General Notes and General Notes 2 and 3 can be deleted.

Stantec will add this logo to the plans and delete Notes 2 & 3.

⇒ It is requested that General Note 4 be revised to read, "It shall be the responsibility of the contractor to furnish all necessary environmentally approved material pits on this project.

Stantec will revise this note.

⇒ General Note 5 can be deleted since it is already covered by the applicable specifications.

Stantec will delete Note 5.

⇒ General Note 6 should be deleted. All required fence will have to be shown in the plans, with applicable pay items and quantities set up. The Project Manager is further advised that GDOT Construction Detail F-3 for field fencing will need to be added to the Project Plans. The data box contained on Detail F-3 should be completed listing the type fence that was agreed upon during Right of Way negotiations for each parcel requiring fencing. The required fencing also needs to be shown on the Construction Plans with the applicable callouts, Station numbers, and offset distances.

Stantec will revise plans to show proposed fence relocations as negotiated during right-of-plans.

⇒ It is requested that Project Note 2 sentence 2 be revised the read, "The cost of the pipe plugs...".

Stantec will revise plans this note.

⇒ It is requested that a note be added to the plan set that specifies that there are no suitable locations within the project limits to dispose of removed bridge materials and that it will be the contractor's responsibility to obtain environmentally approved off site waste facilities.

Stantec will add this note.

⇒ The Benching Detail for placement of fills on existing slopes steeper than 3:1 as recommended by the Soil survey Summary Report needs to be added to the plan set.

Stantec will add this detail to the plans.

⇒ The Alternate Pipe Material Chart as provided in the approved Soil Survey Summary Report needs to be added to the plan set.

Stantec will add the Pipe Material Chart to the plans.

SUMMARY OF QUANTITIES: Not provided, but not required for the PFPR.

⇒ The Project Manager is reminded to include the Signing General notes when placing the signing items in the Summary of Quantities.

Stantec will include the notes in the Summary of Quantities.

⇒ The Project Manager is reminded to verify that the signing Summary of Quantity chart specifies the correct current sign sheeting material (i.e. Type VII, and Type IX).

Stantec will verify the sign sheeting material.

⇒ It is requested that the Project Manager verify that changes and corrections due to the comments provided in this report are accurately reflected in the Summary of Quantities.

Stantec will verify that changes are reflected in Summary of Quantities and Detailed Estimate.

DETAILED ESTIMATE: Not provided, but not required for the PFPR.

⇒ It is requested that the Project Manager verify that changes and corrections due to the comments provided in this report are accurately reflected in the Detailed Estimate as needed.

Stantec will develop the Detailed Estimate with up-to-date quantities in mind.

CONSTRUCTION PLAN AND PROFILE SHEETS:

⇒ It is requested that the intended SE rates be provided in all curve data charts in the plans.

Stantec will add SE rates to curve data charts.

⇒ As discussed at length at the PFPR, it is recommended that the Project Manager verify what applicable speed designs should be applied to the side roads on this project. As currently designed, proposed design geometry for curves meet AASHTO requirements for the speed designs listed below.

- CR 361 – 30 MPH
- CR 362 – 25 MPH
- CR 5 – 25 MPH

- CR 301 – 25 MPH

It is the belief of the PFPR review team that the current speed designs are lower then they should be. The Project Manager is advised that AASHTO's Policy for Geometric Design of Highways and Streets provides minimum design speeds for local rural roads (Exhibit 5-1, page 381) based upon terrain and traffic volumes. It is recommended that the Project Manager verify the type of terrain and traffic volumes in accordance with AASHTO guidelines and to design the curves in accordance with the applicable speed design, or obtain the necessary Design Exceptions.

All local rural roads were designed to meet 45 mph with 4% maximum superelevation. Stantec understands that paved and unpaved roads not posted have default speed limits of 55 mph and 35 mph, respectively. Stantec will request a design variance for these roads and will illustrate the proposed posted speed in the signing/striping plans.

⇒ It is requested that the beginning of the project limits be extended back (south) approximately 1600 feet south of the SR 43 intersection for the purpose of eradicating existing pavement markings that will conflict with the proposed roadway. It is requested that this work be provided by means of milling and inlay of the existing paved surface. It is further requested that the Project Manager consider if a right turn deceleration lane will need to be constructed from SR 17 NB to SR 43 EB considering that the current right lane, as a turn only lane, may actually become the right through lane of SR 17 in the final configuration.

Stantec will denote on plans that existing pavement should be milled/overlayed approximately 1600 ft south of the Preliminary Plans proposed Begin Construction flag. Likewise, signing/striping plans will also denote extending construction and removing existing striping and re-striping for proposed conditions. The existing right-turn lane will remain in place. The width will be approximately 11 ft.

⇒ The Project Manager is advised that existing topographical features shown in the plans do not match those actual features found at the beginning of the project at the time of the PFPR. It is requested that the topographical features be updated to accurately show present features.

Stantec will verify the existing topographic survey and revise as necessary.

⇒ The Project Manager is advised that throughout the plans the Type 12 Guardrail Anchor and Begin/End W-beam Guardrail are incorrectly flagged at the same location. The W-Beam Guardrail should be flagged as beginning/end at the trailing end of the Type 12 Anchor. It is further requested that all Type 12 guardrail anchors be specified as Non-Flare.

Stantec will revise plans accordingly.

⇒ It is requested that the Utility level be turned off on the Construction Plans.

Stantec will turn off Utility level on Construction Plans.

⇒ It is requested that the Project Manager consider including additional pavement widening (eyebrows) at U-turn permissible median openings to accommodate the required design vehicle at the following locations:

- Station 82+50 RT and LT
- Station 124+70 RT and LT
- Station 164+20 RT and LT
- Station 239+00 RT and LT
- Station 308+50 RT

District Traffic Operations stated during PFPR that eyebrows are not required on Type B Median Crossovers, but are definitely permissible. Stantec will address this comment as it affects right-of-way impacts and add eyebrows as necessary.

⇒ As discussed in the PFPR meeting, it is requested that the following driveways be eliminated from the plans either because it was discovered that there is not a current existing driveway provided or that the existing driveway is considered to be abandoned:

- Station 22+82 LT
- Station 42+00 LT
- Station 42+30 LT
- Station 58+75 LT
- Station 60+15 RT
- Station 90+75 LT
- Station 97+15 LT
- Station 102+30 LT
- Station 108+60 LT
- Station 116+15 RT
- Station 173+00 LT
- Station 250+15 RT
- Station 267+50 RT
- Station 284+40 LT
- Station 287+60 LT

Stantec will remove these driveways.

⇒ It is requested that the driveways at the following locations be provided as farm use driveways with a width of 20 feet:

- Station 55+00 LT
- Station 67+75 LT
- Station 86+10 LT

Stantec will revise driveways as requested.

⇒ It is requested that the driveways at the following locations be provided as commercial driveways with a width of 24 feet:

- Station 105+00 LT
- Station 164+25 RT
- Station 171+75 LT

Stantec will revise driveways as requested.

⇒ It is requested that the driveways at the following locations be provided as a single driveway between the roadway and Right of Way limits. If it desired that the driveway needs to be split in different directions then the split should occur outside of the Right of Way limits on temporary easement:

- Stations 28+00 LT and Station 29+25 LT combined to a single driveway at Station 29+25 LT
- Station 111+00 RT, provide single 14 foot wide residential driveway
- Station 301+10 RT, provide single 24 foot wide commercial driveway

Stantec will revise these driveways as requested.

⇒ It is requested that all driveways be provided with a 90 degree skew angle from the roadway to the Right of Way limits. Any alignment changes necessary for tying the proposed driveway into the existing driveway should occur outside of the Right of Way limits on temporary easement.

Stantec will revise driveways as necessary.

⇒ It is requested that a centerline PI flag line with the applicable Station number be provided for all driveway / roadway centerline tie in points.

Stantec will add centerline flags for driveways.

⇒ It is requested that the actual sediment basins be illustrated on the Construction Plans as they are currently shown on the Erosion Control Plans.

Stantec will add sediment basins to the Construction Plans.

⇒ It is requested that the note for obliterating and removing existing pavements of existing roadways be revised to read, "Obliterate and remove existing pavement, grade to drain, and grass". It is further requested that those sections of existing roadways to be removed that are outside of the provided construction limits be hatched or shaded in some manner that clearly illustrates the intended limits of removal.

Stantec will revise plans accordingly.

⇒ The Project Manager is advised that the drainage structures in the near vicinity of the profile low points were not located directly at the specified low point locations. It is requested that the drainage structure locations be revised accordingly to ensure that the structures are located on the plans directly at the profile low points.

Stantec will revise.

⇒ The Project Manager is advised that permanent erosion control features (rip rap) specified at drainage structure outlets need to be shown on the Construction Plans.

Stantec will show these items on the Construction Plans.

⇒ The Project Manager is advised that type 7 curb and gutter for rural type B median openings with a speed design of 65 MPH should not be used as currently shown for median openings at Stations 187+00, 239+50, and 308+66.

Stantec will revise plans accordingly.

⇒ It is requested that flumes be provided where curbing is installed behind guardrail.

Stantec will add flumes at these locations as necessary.

⇒ It is recommend that the designer examine the following sections to evaluate the potential to eliminate the proposed guardrail and continue to meet GDOT's minimum side slope guidelines. The following shouldn't be considered all inclusive but examples of the areas where guardrail may possibly be removed and acceptable side slopes obtained:

- Stations 22+00 LT to 28+00 LT.
- Stations 74+00 LT to 79+00 LT
- Stations 83+00 LT to 86+00 LT
- Stations 118+00 LT to 122+00 LT

- Stations 127+00 LT to 131+00 LT
- Stations 162+00 LT to 165+00 RT
- Stations 200+00 LT to 211+50 LT
- Stations 310+00 LT to 311+00 LT

Stantec will verify guardrail locations and revise as necessary.

⇒ The Project Manager is advised that there are many necessary fence easements missing on the Construction Plans. These will need to be added prior to the Right of Way Plans being authorized.

Stantec will add fence easements as necessary.

⇒ The project Manager is advised that in cut sections throughout the plans, the 2:1 backslope is located exactly at the 30 minimum clear zone point. It is requested that the Project Manager consider providing a more preferred 34' minimum clear zone by moving the toe of the 2:1 back slope out another 4 feet. It appears in most cases that the construction limits will still be contained within the proposed Right of Way corridor. This would give allow for a greater clear zone and provide more excavation material for use on the project.

GRIP typical sections provided by GDOT call for 30 ft clear zone for 65 mph roadway. The 30 ft clear zone point shall remain unchanged.

⇒ It is requested that concrete spillways be provided at the outside edges of the bridge approach slabs.

Stantec will add spillways at bridge approaches.

⇒ It is requested that the required approaches slabs for the bridges be appropriately labeled to reference GDOT Standard 9017R.

Stantec will add GDOT Std 9017R reference to plans.

⇒ It is requested that consideration be provided to utilize the existing cross drain pipe at Station 14+50 LT (newly installed on previous widening project) in lieu of installing a new cross drain pipe at Station 15+00 RT across the existing travel lanes.

Stantec will examine this drainage issue and revise if necessary.

⇒ The proposed ditch at Station 27+50 LT is shown tight against the required Right of Way limits, it is requested that additional temporary construction easement be provided in this area.

Stantec will revise.

⇒ It is requested that the required Right of Way limits on CR 361 be widened slightly to 65 feet left at Station 601+87.49.

Stantec will revise right-of-way.

⇒ Drainage Structure FE 12 should be shown ending within the required Right of Way Limits and should not end in the middle of the driveway as currently shown.

Stantec will revise.

⇒ It is requested that consideration be given for the possibility of providing a 6:1 fill slope at Station 46+50 LT so that guardrail is not required. If this is not possible; it is requested that the Project Manager review appropriate warrant criteria and add guardrail as deemed necessary.

Stantec will revise.

⇒ The Project Manager is advised that it appears that the provided easement for the proposed sediment basin adjacent to CR 362 at Station 622+00 RT needs to be enlarged to ensure that the sediment basin will be outside of the required Right of Way limits.

Easement is labeled incorrectly. Stantec will revise.

⇒ The Project Manager is advised that necessary modifications (extending) or replacement of the existing 24 inch RCP cross drain at Station 76+20 has not been addressed in the plans.

Stantec will address this culvert issue.

⇒ The Project Manager is advised that the existing dam for pond 1 between Stations 80+50 LT and 83+00 LT needs to be relocated entirely outside of the required Right of Way limits or the pond should be drained and filled in. In either case additional easement will need to be acquired in order to perform this work. Typically, it is normally more beneficial to acquire easement for the entire pond and to fill in the pond. Compensation issues with the property owner could be settled during R/W and easement acquisition.

Stantec will add easement around entire pond and label it to be filled.

⇒ It is requested that the Project Manager verify if the proposed side drain pipe will be necessary for the driveway at Station 86+10 RT.

Stantec will verify the need for this pipe.

⇒ It is requested that the Project Manager realign the intended cross drain outlet at Station 117+00 RT so that is further away from the 30 inch driveway side drain end section.

Stantec will examine this culvert and revise plans if necessary.

⇒ It is requested that the Project Manager verify that the required TP 12 Guardrail Anchor pad at Station 130+88 LT has been provided for (the construction limits and cross sections do not appear to reflect it).

TP 12 Anchors will be non-flare as requested during PFPR, so additional shoulder width will not be required.

⇒ It is requested that the Project Manager verify the actual limits of Lake 3 at Stations 141+00 to 143+00 RT and LT, and 145+50 to 147+50 RT. The Bridge Plans specify that the normal pool elevation is 329 and the maximum pool is 334; therefore; it appears that roadway fill will be placed within the lake limits. It is requested that the Project Manager confirm that applicable environmental clearances have been obtained for doing this work.

Stantec will meet with OEL and the GDOT Project Manager to discuss environmental concerns at this location. Appropriate actions will be determined at that time.

⇒ It is requested that median drains or spillways be provided at each end of Bridge 1(since it is in a vertical sag) that will channel median water via a concrete flume or slope drain to the toe of the bridge endrolls.

Stantec will address this drainage issue.

⇒ It is requested that consideration be provided to possibly flatten out fill slopes to 6:1 at Stations 149+00 LT to 151+00 LT. Otherwise, it is believed that the guardrail ending at Station 148+50 LT will have to be extended to Station 151+00 LT.

Stantec will add guardrail to cross sections and construction plans to Station 151+00 LT.

⇒ It requested that the Project Manager consider providing a 6:1 fill slope at Station 151+00 RT or consider maintaining 2:1 slopes from Stations 148+50 RT through 151+00 RT and extending the guardrail .

Stantec will look at flattening slope to 6:1 at 151+00 and revise plans accordingly.

⇒ The Project Manager is advised that it appears that guardrail is warranted between Stations 161+50 RT to 165+50 RT.

Stantec will add guardrail to these stations.

⇒ It is requested that the sediment basin located at Station 178+50 RT be relocated so that it is outside of the stream buffer limits.

Stantec will move the sediment basin if possible or remove it if it will not work.

⇒ It is requested that demolition easements be provided for the existing structures at 172+25 LT, 173+25 LT, and 191+25 LT.

Stantec will add these easements.

⇒ The Project Manager is advised that during the subsequent field inspection of this project, an existing pond and earth dam structure were found at Station 180+00 LT that appeared to intrude into the required Right of Way Limits. It is recommended that existing topographical data be obtained in this area to ascertain if any part of the pond or dam structure will be within the Right of Way Limits. If so; the dam needs to be relocated entirely outside of the required Right of Way limits or the pond should be drained and filled in. In either case additional easement will need to be acquired in order to perform this work. Typically, it is normally more beneficial to acquire easement for the entire pond and to fill in the pond. Compensation issues with the property owner could be settled during R/W and easement acquisition.

Stantec will add note to drain and fill pond and add easement to accommodate this construction.

⇒ It is requested that the required easement between Stations 196+68 RT to 200+00 RT be identified and illustrated to differentiate that portion of the easement required for slopes verses that portion required for the sediment basin.

Stantec will revise.

⇒ It is recommended that the Project Manager confirm that applicable environmental clearances have been obtained for relocating the existing stream channel between Stations 207+50 RT to 210+50 LT. It is further requested that the Project Manager specifically identify this as channel

excavation with the applicable details and pay items. The Project Manager is further advised that the proposed 2 foot flat bottom ditch shown in the cross sections will not provide the necessary drainage capacity required to contain the outfall of a 7 foot X 6 foot culvert. The Project Manager is also advised that additional Right of Way will be required in the vicinity of Station 210+00 RT.

Stantec will meet with OEL and the GDOT Project Manager to discuss environmental concerns at this location. Stantec will add the appropriate details and pay items to the plans. Stantec will re-examine the capacity of the 2-ft flat bottom ditch and the stormwater discharge at the 7'X 6' box culvert. The plans will be revised as necessary. Stantec will add additional riprap in the drainage channel.

⇒ It is requested that the Project Manager verify the actual limits of Hart Creek (lake tributary) at Stations 223+50 RT to 224+50 RT. The Bridge Plans specify that the normal pool elevation is 329 and the maximum pool is 334; therefore; it appears that roadway fill will be placed within the streams limits. It is requested that the Project Manager confirm that applicable environmental clearances have been obtained for doing this work.

Stantec will meet with OEL and the GDOT Project Manager to discuss environmental concerns at this location. Appropriate actions will be determined at that time.

⇒ It is requested that a median drain or spillway be provided at the south end of Bridge 2 (since it is in a vertical sag) that will channel median water via a concrete flume or slope drain to the toe of the bridge endroll.

Stantec will address this drainage issue.

⇒ It is requested that the required easement between Stations 270+98 RT to 273+91 RT be identified and illustrated to differentiate that portion of the easement required for drainage verses that portion required for the sediment basin.

Stantec will revise.

⇒ It is requested that the Project Manager consider incorporating the existing topographical features of the existing roadside drainage into the final design template from Station 240+00 LT to 305+00 LT in a manner that eliminates the maintenance of two separate ditches within the Right of Way Limits (the existing on the west side of the existing roadway and the new one between the new and existing roadway). For further consideration, since this project is a borrow project, this may provide more excavation material for use on the project.

Stantec will evaluate this issue and incorporate revisions into construction plans.

⇒ It is requested that a small amount of easement for construction and maintenance be acquired at the inlet end of the proposed cross drain at Station 272+00 LT.

Stantec will revise.

⇒ It is requested that Orange Safety Fencing be added between the cemetery and gravity wall at Station 302+00 RT.

Stantec will revise.

⇒ The Project Manager is advised that the current plans show construction work occurring outside of the Right of Way limits from Station 319+74 LT to the end of the project at Station 323+85 LT. At the very least, easement will be required for this area; however, it is further suggested that a more prudent action may be to continue the acquisition of proposed Right of Way from where it

currently ends at Station 319+74 LT to Station 323+85 LT. This would be required at a later point for the future continuation of the SR 17 four lane section.

Stantec will coordinate with Clark Patterson's Unit 46. Plans will reflect Clark Patterson's proposed improvements. R/W for the properties will be included for purchase with Unit 46. It will be shown as existing R/W on Unit 40.

⇒ It is recommended that the Project Manager verify what the required minimum transition length for the southbound lane shift at the end of the project should be in accordance with GDOT Standard 9121 and to revise the transition length as found necessary.

Stantec discussed the taper length with the GDOT Project Manager and is awaiting a decision on the appropriate length of this taper. If the taper is extended, Stantec will incorporate topographic information from Unit 46 into the Unit 40 database and extend the limits of the project farther north. The taper cannot be extended south due to the location of the SR17/CR6 intersection.

⇒ A driveway side drain pipe will be required on CR 362 at Station 623+54 LT.

Stantec will revise plans.

⇒ The mainline profile should be adjusted to more closely match the existing roadway elevation. It is clear that this was the intent of the project as the Typical Sections indicate retaining the existing roadway; however, the profile as shown is too high to effectively accomplish this. Conversation at the PFPR meeting indicates that the existing pavement is not to be retained which would further lend justification to lowering the profile. The profile as shown is not economical as it will unnecessarily require thousands of yards of borrow excavation and increase the cost of the project. The profile, as shown, is actually "filling" on top of hills where cuts would appear to be in order. In addition, staging of the project can be greatly simplified and the costs lowered as the use of temporary pavements and working in one section more than once can be eliminated.

The profile was designed in 2004 to accommodate an overlay of the existing two lanes. There are locations where the profile could be improved upon to accomplish this in a more cost effective manner. The pavement evaluation was completed during the summer of 2006 and suggested full-depth reclamation of the pavement. Stantec will revise the profile from Station 16+00 through Station 69+50; Station 82+00 through Station 87+00; Station 115+50 through Station 131+00; Station 148+00 through Station 176+00; Station 256+00 through Station 274+00. The intent of these revisions is to reduce the required borrow excavation, which in turn will reduce construction costs.

The profile between Stations 131+00 and 147+00 will not be revised. Revising the profile through this area would negatively impact the Big Creek Bridge crossing at Station 144+00. Also, this section was designed mostly as a cut section, so a design intended for a more effective overlay would actually result in more borrow excavation.

The profile between Stations 190+00 and 225+00 will not be revised; it is dictated by two key factors. The first is stage construction of Relocated CR301 and Relocated CR5. The SR17 profile should be very near grade at the relocated intersection with these side roads. This will ensure easier maintenance of traffic throughout construction. The CR301 and CR5 profiles will be revised as indicated in a previous comment to better accommodate this construction. The second factor is the Hart Creek Bridge crossing at Station 225+00. Lowering the profile prior to the bridge would result in lowering the bridge elevation itself. This, in turn, would result in the removal of considerably more soil beneath the bridge to allow for the appropriate free board. Already an environmental concern, it is Stantec's and

the GDOT Project Manager's opinion that the profile through this area should remain as originally designed.

The profile between Stations 225+00 and 249+00 will not be revised. Revising the profile through this area would negatively impact the Hart Creek Bridge crossing at Station 225+00. Also, this section was designed mostly as a cut section, so a design intended for a more effective overlay would actually result in more borrow excavation.

The profile between Station 256+00 and the end of the project will not be revised. A large percentage of the profile at this location produces cut excavation. Also, the profile is designed to accommodate stage construction at the tie-in point near Station 310+00. Revising this section of the profile could create staging problems.

⇒ The profile break over rate where the side streets meet the mainline must meet the GADOT Design Guidelines. The rates of county roads 301 and 5 far exceed the maximum allowed. The break over shown for CR 5 would most likely result in pull type campers and "lowboys" dragging as they entered and exited the roadway.

Stantec will revise profile.

⇒ The profile of CR 301 should be adjusted to hold the existing roadway elevations where the new construction leaves the existing roadway (station 400+00 through 406+50). This will be necessary in order to allow for an asphalt overlay and actually have a profile that can be constructed while traffic is maintained.

Stantec will revise profile.

⇒ The profile of CR 5 should be adjusted to hold the existing roadway elevations where the new construction leaves the existing roadway (station 423+50 through 427+00). This will be necessary in order to allow for an asphalt overlay and actually have a profile that can be constructed while traffic is maintained.

Stantec will revise profile.

⇒ It is recommended that the sight distance on SR 17 NB between the profile highpoint at Station 35+14 +/- and the intersection of CR 361 at Station 39+42 +/- be checked. AASHTO recommends a minimum stopping sight distance of 645 for 65 MPH Speed Design which would be on the other side of the crest vertical at Station 32+97 +/-.

Sight distance is met. K-values meet minimum requirements. Also, the project will be cleared from R/W line to R/W line, so no obstructions will be in place to impede sight. No action required.

⇒ It is recommended that the sight distance on SR 17 SB between the profile highpoint at Station 190+07+/- and the intersection of CR 301 at Station 186+83 +/- be checked. AASHTO recommends a minimum stopping sight distance of 645 for 65 MPH Speed Design which would be on the other side of the crest vertical at Station 193+28 +/-.

Sight distance is met. This curve meets minimum K-value requirements. No action required.

⇒ It is requested that the Project Manager verify and identify the PI as shown on CR 301 profile at Station 410+77.

Stantec will clarify the profile labeling for grade breaks.

⇒ CR 6 Curve 12 is incorrectly identified as curve 6 on Plan Sheet 15-21.

Stantec will revise plans.

STAGE CONSTRUCTION PLANS:

⇒ The staging plans to not adequately address the issue of drainage. In many locations it appears to be almost impossible to drain the median with the use of existing and or proposed drainage. The proposed profile is greatly impacting this. Many median cross drains should be designed to outfall across the new lanes rather than the existing. This would greatly reduce the cost of the work and provide for drainage during staging. The staging also does not appear to have addressed the fact that the culverts must be constructed in two stages all the while maintaining drainage. (The existing roadway cannot be open cut to allow culvert construction without traffic being moved.)

Stantec will revisit drainage during staging and revise as necessary.

⇒ All work that can be done during a particular stage should be shown in that stage (example, Stage 1 does not indicate any Stage 1 construction being performed between Stations 10+00 through 191+00 that could clearly be performed during stage one. The current work specified in Stage 1 could be combined with the Stage 2 work between Stations 10+00 through 191+00 into Stage 1). The plans currently list four stages; it appears the work could be accomplished in two. If the work was done in the manner shown in the plans then it would required twice as long to perform.

Staging was designed to indicate construction to be performed prior to shifting traffic. Construction of southbound lanes from Stations 10+00 through 191+00 will not be required to accommodate the traffic shift at Station 191+47, which will occur upon completion of the work from Stations 191+47 through 313+42. Construction of southbound lanes will be completed, less the topping course of asphalt and final grading, during Stage 2 at which time traffic will be shifted to the southbound lanes. Stage 3 plans reflect construction of northbound lanes, less topping course of asphalt. Northbound traffic will then be shifted to the proposed northbound lanes. Southbound traffic will remain at the proposed southbound lanes location. Stage 4 plans reflect final grading and application of the wearing course of asphalt for all proposed lanes.

The profile between Stations 190+00 and 225+00 is largely dictated by two key factors. The first is stage construction of Relocated CR301 and Relocated CR5. The SR17 profile should be very near grade at the relocated intersection with these side roads. This will ensure easier maintenance of traffic throughout construction. The CR301 and CR5 profiles will be revised as indicated in a previous comment to better accommodate this construction. The second factor is the Hart Creek Bridge crossing at Station 225+00. Lowering the profile prior to the bridge would result in lowering the bridge elevation itself. This, in turn, would result in the removal of considerably more soil beneath the bridge to allow for the appropriate free board. Already an environmental concern, it is Stantec's and the GDOT Project Manager's opinion that the profile through this area should remain as originally designed.

Revisions to staging plans will be made as a result of other plan revisions, such as profile revisions and drainage revisions.

⇒ The profiles must be adjusted to allow for staging. Crossovers and tie-ins cannot be constructed cost effectively as shown.

Stantec will revise the profile from Station 16+00 through Station 69+50; Station 82+00 through Station 87+00; Station 115+50 through Station 131+00; Station 148+00 through Station 176+00; Station 256+00 through Station 274+00.

SIGNING AND MARKING PLANS:

⇒ It is requested that the title blocks in the signing and marking plans correctly identify the sheets as "Signing & Marking" and to revise sheet sections in accordance with the PPG from 13-XX to 26-XX.

Stantec will revise title blocks and sheet numbering.

⇒ It is requested that all R5-1 signs be specified as 36" x 36" (Expressway Size).

Stantec will revise plans.

⇒ It is requested that all R6-1L signs be specified as 54" x 18" (Expressway Size).

Stantec will revise plans.

⇒ It is requested that all R6-3a and R6-3 signs be specified as 36" x 30" (Expressway Size).

Stantec will revise plans.

⇒ It is requested that all R2-1 signs installed on the multi-lane sections be specified as 36" x 48" (Expressway Size).

Stantec will revise plans.

⇒ It is requested that preformed plastic tape traffic markings be utilized for the concrete bridge decks.

Stantec will revise plans.

⇒ It is requested that W8-13 signs be provided in advance of the bridge approaches (Stations 138+00 RT, 149+50 LT, 219+00 RT, and 234+00 LT).

Stantec will revise plans.

⇒ It is requested that I series signs identifying the specific stream names at the two bridge sites be added to the plans.

Stantec will revise plans.

⇒ It is requested that the specified use of longitudinal yellow mini skip stripes across the median openings be deleted from the plans.

Stantec will revise plans.

⇒ It is requested that Type A striped separator islands be provided at the end of deceleration lanes and that R1-2 signs be provided at the yield point at the following locations:

- Station 39+50 RT
- Station 48+70 RT
- Station 186+50 RT
- Station 187+00 LT

Stantec will revise plans.

⇒ The Project Manager is advised to ensure that reflective sheeting types, special provisions, and pay items (type VI shall change to Type IX sign sheeting) for signs comply with the Director of Preconstruction's instructions dated October 11, 2006.

Stantec will ensure that plan elements are in compliance.

⇒ It is requested that the designated signs accompanying the W2-1 and W2-2 signs all be correctly identified as W16-8 or W16-8a signs in accordance with the 2003 edition of the MUTCD.

Stantec will revise plans.

⇒ It is requested that the side street acceleration lanes onto SR 17 mainline be deleted at the following locations. It is requested that a 50 foot long taper be provided instead.

- Station 40+00 RT
- Station 186+50 LT
- Station 187+50 RT
- Station 309+00 RT

Stantec will add signs at these locations.

⇒ It is requested that W1-2L or W1-2R signs (whichever is applicable) be added at the following locations:

- Station 95+30RT
- Station 106+80 LT
- Station 296+50 RT
- Station 315+00 LT
- Station 418+00 RT
- Station 425+00 LT

Stantec will add signs at these locations.

⇒ It is requested that the R2-1 signs be deleted at Stations 33+00 LT, and 55+00 RT; and that R2-1 signs (55) be added at Stations 13+00 RT, 112+00 RT, and 116+00 RT.

Stantec will add signs at these locations.

⇒ It is requested that the stop ahead warning signs be correctly identified as W3-1 signs (not W3-1A as currently shown in the signing and marking plans).

Stantec will revise plans.

⇒ It is requested that the correct spelling of Russells Landing be verified, it is believed that the correct spelling should be "Russell's Landing". It is requested that all applicable signs be corrected as found necessary.

Stantec will verify and revise plans.

⇒ It is requested that a M3-1(North), M1-5 (SR 43), and M6-1L (Arrow) sign be added at Station 7+00 LT.

Currently, Guide Signs exist at this location. Stantec will verify the information provided on these signs and revise plans as necessary.

⇒ It is requested that a D1-1 sign (Lincolnton) sign be added at Station 9+00 LT.

Stantec will add this sign at this location.

⇒ It is requested that the sign assembly shown at Station 51+50 RT be relocated to Station 9+00 RT.

Stantec will revise plans.

⇒ It is requested that a M2-1 (JCT), M3-1 (North), and M1-5 (SR 43) sign be added at Station 11+00 LT.

Stantec will add signs at these locations.

⇒ It is requested D2-3 sign (Washington 19, Lexington 45, Elberton 48) at Station 11+00 RT.

Stantec will add signs at these locations.

⇒ It is requested that the Sign assembly at Station 36+00 LT be deleted.

Stantec will remove these signs from the plans.

⇒ It is requested that a route designation sign assembly be added at Station 114+00 LT and RT.

Stantec will add signs at these locations.

⇒ It is requested that the signs at Station 125+31 LT and 127+31 LT be switched with one another.

Stantec will revise plans.

⇒ It is requested that a D2-2 sign (Washington 14, Lexington 40, Elberton 43) be added at Station 275+00 RT.

Stantec will add signs at these locations.

⇒ It is requested that a M1-1 (Interstate 20) and a M6-3 sign be added at 301+00 LT.

Stantec will add signs at these locations.

⇒ It is requested that all applicable signs associated with transitioning from a 4-lane section to a 2-lane section be provided in accordance with the Signing and Marking Guidelines Figure A-1. These signs should be expressway sized and formatted to the current versions.

Stantec will add the applicable signs.

TRAFFIC SIGNAL PLANS: N/A

UTILITY PLANS:

Electrical: Jefferson Energy Cooperative
Kenny Johnson
P.O. Box 457
3077 Hwy 17 North
Wrens, GA 30833
Telephone: 800-342-0322

Telephone: Bellsouth Telecommunications Inc.
3841 Wrightsboro Road
Augusta, GA 30909
Telephone: 706-228-5203

Gas: None

Water/Sewer: None

Railroad: None

Cable TV: None

Other: None

General Utility Comments:

⇒ It is requested that all existing utility linestyles match the utility legend.

Stantec will revise plans.

⇒ It is requested that the existing Right of Way be flagged on Plan Sheet 12-5.

Stantec will revise plans.

⇒ It is requested that the existing electrical facilities be shown on Plan Sheet 12-12.

Stantec will revise plans.

⇒ It is requested that the current "Call Before You Dig" logo is added to the Utility Plans.

Stantec will revise plans.

⇒ As discussed during the PFPR it is requested that overhead facilities at the bridge sites be moved as far as possible outside the limits of construction (100 feet from the outside edges of the proposed bridges) to accommodate the use of cranes on temporary work bridges / barges. It is suggested that the temporary relocation of the facilities to temporary easement during construction may be necessary.

The first submittals of Utility Plans have been submitted to the Utility owners and have been received and transmitted to the Project Manager

Stantec will show additional R/W and easement at the two bridge locations to accommodate utilities. The easement will be temporary for temporary relocation of utilities as suggested.

BRIDGE PLANS:

Existing bridges: No Comments

Proposed bridges: No Comments

EROSION CONTROL PLANS:

Items proposed in plans:

Silt Fence, Type A and C
Baled Straw
Inlet Sediment Traps
Sediment Basins
Rip Rap
Rip Rap Ditch Checks
Erosion Control Mats
Silt Retention Barrier

Additional items recommended:

⇒ Silt Control Gates
⇒ Construction Exits
⇒ Maintenance of all applicable items.
⇒ Plastic Filter Fabric
⇒ Grassing, Temporary and Permanent
⇒ Mulch
⇒ Fertilizer, Mixed Grade and Nitrogen Content
⇒ Lime, Agricultural and Liquid
⇒ Water Quality Monitoring and Sampling
⇒ Water Quality Inspections
⇒ Temporary Slope Drains

Stantec will add these items as necessary.

General Erosion Control Comments:

⇒ The Project Manager is reminded that the Office of Road Design has issued revised guidelines for Erosion Sedimentation and Pollution Control Plans (ESPCP) on January 8, 2007. These new guidelines are to take effect for all projects with scheduled let dates of April 2007 and beyond. These revisions included:

- ESPCP Guidelines
- EPD Checklist
- Revised Certification Statements
- Revised ESPCP General Notes

It is requested that the Project Manager verify that the Erosion Control Plans are revised in accordance with the revised guidelines, and that all necessary Certification Statements, and General notes are added to the plans.

Stantec will ensure that revised statements and general notes are provided in the plans. Plans will be updated to comply with new guidelines.

⇒ A legend identifying all proposed BMP devices need to be provided in the Erosion control Plans.

Stantec will add a BMP legend to the plans.

⇒ The BMP code designations all need to be updated to the latest versions.

Stantec will update the plans accordingly.

⇒ It is requested that the Project Manager verify that all sediment basins and easements are located outside of and applicable stream / lake buffer areas. The current plans show sediment basin easements in very close proximity to stream / lake channels at bridge 1, the sediment basins at Station 178+50 RT and LT are currently shown within the stream buffer zone.

Stantec will relocate the proposed sediment basins beyond buffer zones.

⇒ All sediment basins should be located outside of the Right-of-Way limits on easement (examples of basins shown within the right of way limits include Stations 141+00 LT, 146+00 LT, 197+00 RT, 199+00 LT, 220+00 LT, 223+00 RT, 228+00 LT, 240+00 RT, 242+00 LT, 273+00 RT, and 314+00 LT). The Project Manager is advised that corrections of this item will require additional easements throughout the plans.

Stantec will relocate the proposed sediment basins outside the R/W limits on temporary easement.

⇒ GDOT Construction Detail D-22 needs to be included in the Plan set with the dimension chart filled out for all sediment basins.

Stantec will provide Detail D-22 with the Final Plan Submittal.

⇒ It is requested that consideration be provided for requiring longitudinal silt fence along the toe of higher fill sections that utilize a toe ditch between the toe of the slope and the top of the ditch.

Stantec will examine the need for longitudinal silt fence at these locations and add as necessary.

DRAINAGE PROFILES:

⇒ It is requested that all specified 15 inch drainage pipe be changed to a minimum diameter of 18 inches.

Stantec will revise those culverts which cover can be achieved.

⇒ It is requested that the Project Manager review the hydraulic calculations to ensure that specified drainage structures replacing larger sized structures will provide adequate drainage capacity for the necessary design storm. Examples to check include the following locations:

- Station 178+25; new 24 inch cross drain replacing an 2' X 3' X 3 barrel culvert
- Station 199+75; new 24 inch cross drain replacing an existing culvert
- Station 207+50; new 7' X 6' culvert replacing what appears to be a 7 foot span X 3 barrel culvert
- Station 210+00; new 48 inch cross drain replacing an existing 3' X 3' X 3 barrel culvert.

Stantec will verify the size reduction of structures and revise as necessary.

⇒ It is requested that consideration be provided for changing Junction Box 1 at Station 26+20 to a median inlet, since blind junction boxes can be problematic for maintenance.

Stantec will revise plans.

⇒ It is requested that consideration by provided for rerouting the alignment of the proposed 48 inch cross drain at Station 210+01. It is suggested that from a constructability (depth) and staging (maintaining drainage across stage 1 traffic lanes) standpoint that the proposed 48 inch cross drain and median inlet I-40 could be shifted slightly down Station at the center line to tie in to the existing 3 X 3 culvert and continue to the right to it's intended outfall during stage one construction. Then during stage 2 construction the remaining 48 inch cross drain to the left could be installed.

Stantec will evaluate moving drop inlet I-40 to top of existing 3x3 box culvert and extending box culvert. Culvert may be retained. If not Stantec will revise plans to better accommodate stage construction.

⇒ A one foot deep blanket of Type II Foundation Backfill Material should be provided under the barrels of all culverts and 46 inch and larger cross drains on this project as recommended by the Soil Survey Summary Report.

Stantec will add this note to the plans.

⇒ As discussed in the PFPR meeting, it is requested that the required length of skewed cross drain pipes be verified. It is noted on the drainage profiles that normally, skewed cross drain sections appear to utilize flatter slopes due to the diagonal alignment of the of the cut lines. In the case of this project however, the skewed cross drain sections show the same slope rate as would apply if the cut line was perpendicular to the centerline resulting in the pipe lengths being possibly shorter then they should be.

Stantec will verify the lengths of proposed cross drains pipes and revise the drainage cross sections as necessary.

⇒ As discussed in the PFPR meeting, It is recommended that the cross drain systems crossing CR 301 at Station 409+76, and CR 5 at Station 412+68 be redesigned to eliminate the proposed intermediate blind CMP slope drains (26% grade) connecting to the flatter storm drain pipes at each end.

Stantec will evaluate these cross drains and revise as necessary.

CROSS SECTIONS:

⇒ The Project Manager is advised that the shoulder break point between Stations 185+50 LT and 186+00 LT needs to flushed out approximately 2 to 3 foot further in order to provide a 30 foot wide clear zone from the edge of the through travel lane or guardrail will be required. It is thought that flushing out the shoulder is the better solution.

Stantec will examine extending the shoulders to provide 30ft (min) of clear zone. 2:1 slopes will be retained to reduce R/W impact or 6:1 slopes will be provided at the typical shoulder break point. This second option would likely require additional easement, but it may be easier to construct with no slope transitions from 6:1 to 2:1.

⇒ It is requested that the Project Manager review the side ditch drainage on CR 361 between Stations 600+50 RT and the intended cross drain inlet at Station 601+21 RT to verify positive drainage. It currently appears that the low point of the ditch will be at Station 601+00 RT.

Slopes at Station 601+00 tie to SR17 side slopes, so low point is at 601+21. Stantec will revise CR361 cross sections to better illustrate the proposed conditions.

⇒ It is requested that the Project Manager verify if the CR 361 cross section at Station 600+00 is correct since it would be located in the middle of the SR 17 median opening.

Stantec will revise CR361 cross sections to better illustrate the proposed conditions.

⇒ It is requested that the Project Manager verify if the CR 362 cross sections at Stations 620+00 and 620+50 are correct since they would be located on the SR 17 mainline. It is further requested that the provided cross slope at Station 620+50 be verified as correct, since it is on the mainline it should be the same as the mainline profile grade.

Stantec will revise CR362 cross sections.

⇒ It is requested that the Project Manager verify if the CR 301/5 cross sections at Stations 410+50 through 411+50 are correct since they would be located on the SR 17 mainline.

Stantec will revise CR301/CR5 cross sections to better illustrate the proposed conditions.

⇒ It is requested that the Project Manager verify if the CR 6 cross sections at Stations 500+00 and 500+50 are correct since they would be located on the SR 17 mainline.

Stantec will revise CR6 cross sections to better illustrate the proposed conditions.

⇒ It is requested that cross slope directional arrows be provided on the Cross Sections.

Stantec will add cross slope directional arrows on cross sections through superelevated sections. Normal crown sections will not be labeled.

WALL PLANS: I had no comments

WETLAND MITIGATION/RESTORATION PLANS: N/A

RIGHT OF WAY PLANS: N/A

LIGHTING PLANS: N/A

SPECIAL PLAN DETAILS: N/A

FIELD INSPECTION

Comments during the Field Inspection have been incorporated into the applicable sections of this report.

DDZ

PERSONNEL PRESENT

David Zoeckler	GDOT – Engineering Services	
Jamie Lindsey	GDOT – District Utilities	
Todd Price	GDOT – District Traffic Operations	
Raye Southerland	GDOT – District Traffic Operations	
Lynn Bean	GDOT – District Construction	
Tommy Johnson	GDOT – District R/W	
James Smith	GDOT – District Construction	
Terrell McMillan	GDOT – District Construction	
Mitchell Greenway	Stantec (Design)	mitchell.greenway@stantec.com

Brett Gillis	Stantec (Design)	brett.gillis@stantec.com
Thomas Cox	GDOT – Office of Consultant Design	
Renee Hollie	GDOT – District R/W	
Rusty Merritt	GDOT – District Construction	

c: Todd Long
Mohammed Abubakari
Thomas Cox
Michael L. Thomas
Russell Merritt
James Smith
Lynn Bean
Terrell McMillan
Michael D. Thomas
George Brewer
Tommy Johnson
Roger Price
Jack Cooper
Dale Brantley
Richard Marshall
David Hoge
Leigh Priestley
Georgene Geary
Paul Liles
Genetha Rice-Singleton
Angela Alexander
Johnny Quarles
Phil Copeland
Gail D'Avino
Susan Knudson
Susan Watts
Lisa Westberry
Rich Williams
Quinn Hazelbaker
David Crim
Jeff Baker
Nabil Raad
Jamie Simpson
Ron Wishon
Steve Matthews

SCORING RESULTS PER TOPPS 2440-2

Project Number:	County:	PI No.:	Project Designed By:	
EDS-545(40)	McDuffie	222250	DOT Office:	Office of consultant Design
			Consultant:	Stantec
Date FPR Held: January 18, 2007	☒ Preliminary	☐ Final		

Project Type:
Choose appropriate project type:

☒ Major ☐ Minor
☐ Urban ☒ Rural

☐ Bridge Replacement ☐ Intersection Improvement ☐ New Location ☐ Miscellaneous
☒ Widening & Reconstruction ☐ Interchange Reconstruction ☐ Interstate ☐ ATMS

FOCUS AREAS	SCORE	RESULTS
Presentation	90	☐ Did not follow PDP ☐ Missing information ☐ Incorrect quantities ☐ Did not follow PPG ☐ Conflicting information ☐ Missing pay items ☐ Unclear requirements ☐ Incorrect information ☐ Incorrect pay items **Notes: Minor discrepancies**
Judgment	90	☐ Did not follow Concept Report ☐ Did not follow GDOT policy ☐ Did not follow AASHTO requirements ☐ Did not use sound engineering judgment **Notes: appears that proposed profile could match existing roadway better, minimizing grade changes, and simplifying staging**
Environmental		☐ Not consistent with Environmental Document ☐ Modification of Environmental commitments required ☐ Modification of Environmental Permits required ☐ Modification of Environmental Document required ☐ Unreasonable environmental commitments/requirements **Notes:**
Right of Way	90	☐ Did not provide adequate Right of Way/Easements ☐ Was not consistent with constraints to accessing property ☐ Did not show physical characteristics of property **Notes: Sediment basins needs to be moved outside of R/W on easements, minor discrepancies**
Utility	100	☐ Did not show existing Utilities on plans ☐ Utility Legend discrepancies ☐ Did not define all conflicts ☐ Modification of Utility Relocation Plan required ☐ Did not show all relocations ☐ Did not show Contract items **Notes:**
Constructability	90	☐ Did not provide Staging Cross Sections ☐ Did not include Intermediate Completion Dates ☒ Did not address Temporary Drainage ☐ Did not address Side Road Staging ☐ Staging will not work as shown **Notes: Staging could be compressed into 2 stages instead of 4, minor discrepencies**
Schedule	100	☐ Submitted late for Scheduled Let Date ☐ Incomplete Initial Submittal ☐ Extensive Re-do work ☐ Additional Field Plan Review required **Notes:**

Value Engineering Process

VALUE ENGINEERING PROCESS

Introduction

This report summarizes the analysis and conclusions by the PBS&J Value Engineering team as they performed a VE Study during the period of April 16-19, 2007 in Atlanta, Georgia, for the Georgia Department of Transportation.

The Value Engineering Study team and its leadership were provided by PBS&J. This VE Team consisted of the following:

Les Thomas, P.E., CVS-Life	VE Team Leader
Ramesh Kalvakaalva, PE	Structural Engineer
Steven Gaines, P.E.	Highway Design Engineer
Gary King	Highway Construction Specialist
Randy Thomas, AVS	Assistant Team Leader

The Value Engineering Team followed the Seven Step Value Engineering job plan as promulgated by SAVE International. This Seven Step job plan includes the following:

- **Investigation/Information Phase** – during this phase of the VE Team's work, the team received a briefing from the designers and project delivery team representatives of the Georgia Department of Transportation (GDOT). This briefing included discussions of the design intent behind the project and the cost concerns. Gary King visited the project site and provided the team with photos and his insight.
  In the working session that followed, the VE Team developed cost models from the cost data provided by GDOT and the designers and familiarized themselves with the construction drawings and other data that was available to the team. Some of the representative project information (concept report and cost estimate,) may be found in the tabbed section of this report entitled ***Project Description***. Following this current narrative, the reader will also find a cost model done in the Pareto fashion, i.e., identifying the highest costs down to the lowest costs for the larger construction cost elements. This cost model, developed by the VE Team, was used by the VE Team to help focus their week of work. The headings on the Pareto Chart also were used as headings for creative phase activities.

- **Analysis Phase** – during this phase the VE Team determined the "**Functions**" of the project. This was accomplished by reviewing the project from the simplest format in asking the questions of "What is the project suppose to do?", and "How is it suppose to accomplish this purpose? In the Value Engineering vernacular, the answers to these questions are cast in the form of active verbs and measurable nouns. These verb/noun pairs form the basis of the function analysis which distinguishes a Value Engineering effort from a potentially damaging cost cutting exercise.

- The important functions of the project were identified as follows:

    - **Project Objective/Goals**
        - **Improve Safety**
        - **Increase Capacity**
        - **Increase Load Capacity**
        - **Preserve Historic Areas**

    - **Project Basic Functions**
        - **Replace Deficient Bridges**
        - **Provide two additional travel lanes**
        - **Provide additional turn lanes**
        - **Provide grassed median**
        - **Accommodate "U" turns**
        - **Transport stormwater runoff**

    This function analysis is documented further through the inclusion of the Function Analysis and Cost –Worth worksheets. The Cost-Worth Ratios that are included helped the VE Team to identify areas of interest for the brainstorming session. When a function has a current cost-worth ration of greater than 1.00 it is often found that there are opportunities for reducing the cost, thereby better matching its actual worth for the project.

- **Speculation Phase -** The VE team performed a brainstorming session to identify ideas that might help meet the project objectives:

    - Improve Safety
    - Improve Capacity
    - Increase Load Capacity
    - Separate Traffic

    This brainstorming session initially identified numerous ideas that were then evaluated in the Judgment phase. The reader will find the creative worksheets enclosed. These same work sheets were also used to record the results of the Judgment/Evaluation Phase.

- **Evaluation Phase** – Once the VE Team identified the creative ideas, it was necessary to decide which alternatives should be carried forward. This is the work of the Evaluation or Judgment Phase. The VE Team reflected back on the project constraints and objectives shared with the team by the owner's representatives, in the kick-off meeting on the first day of the workshop. From that guidance, the team selected ideas that they believed would improve the project by a vote process.

- Following that selection process, the VE Team used the following values as measures of whether or not an alternative had enough merit to be carried forward in the VE process:

    - Construction Cost Savings
    - Maintainability
    - Ability to Implement the Idea
    - General Acceptability of the Alternatives
    - Constructability

    Based on these measurement sticks, the VE Team evaluated the alternatives and graded them from 5 (Excellent) down to 1 (Poor). Other notes about the alternatives are annotated at the bottom of the enclosed creative and evaluation sheets.

- **Development Phase** – During this phase, the VE Team developed each of the selected design alternatives. This effort included a detailed explanation of the idea with sketches as appropriate to clarify the idea from the original concept, advantages and disadvantages, a technical explanation and an estimation of the cost and resultant savings if implemented. (see the tabbed section – Study Results)

- **Recommendation Phase** – During this phase the VE Team reviews the alternative ideas to confirm which ones are appropriate for the project, have an opportunity for success and which will improve the value of the project if implemented.

- **Presentation Phase** – As noted earlier, the team made an informal "out-briefing" on the last day of the workshop, designed to inform the Owners and the Designers of the initial findings of the VE Study. This written report is intended to formalize those findings.

The VE team is enclosing a copy of the attendance sheets so that the reader can be informed about who participated in the workshop proceedings. The cost model developed in the information phase is also enclosed. This cost model is done in the Pareto Fashion. This means that it is intended to highlight the high cost items in the current working estimate for the construction of the project. These high cost items were then evaluated by the VE Team as to whether the team might be able to have an effect on these line items. Where it was felt that the team might affect the line items, they were typically used as the topics for the creative phase.

Function Analysis and Cost-Worth

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County
P.I. Nos.: 222250, 227815,227816, SR 17 from SR 43 to West of SR 6

SHEET NO.: 1 of 2

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	Noun	KIND			
	Roadway	**Enhance**	**Safety**	**B**	**$18,239**	**$16,000**	**C/W Ratio = 1.14**
		Support	Traffic	B			
		Route	Stormwater	RS			
		Expedite	Commerce	HO			
		Restrict	Access	HO			
	Bridge 1 (Big Creek)	**Cross**	**Creek**	**B**	**$1,084**	**$900**	**C/W Ratio = 1.2**
		Support	Traffic	B			
		Allow	Flows	RS			
		Protect	Traffic	RS			
		Minimize	Erosion	RS			

Function defined as: **Action Verb** **Measurable Noun**

Kind: B = Basic; S = Secondary; RS = Required Secondary; HO = Higher Order; LO = Lower Order; U = Unwanted

Function Analysis and Cost-Worth

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County
P.I. No.: 222250, 227815,227816, SR 17 from SR 43 to West of SR 6

SHEET NO.: 2 of 2

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	Noun	KIND			
	Bridge 2 (Hart Creek)	Cross	Railroad	B	$633	$550	C/W Ratio = 1.15
		Support	Traffic	B			
		Allow	Flows	RS			
		Protect	Traffic	RS			
		Minimize	Erosion	RS			
	Drainage	Transport	Stormwater	B	$3,973	$3,000	C/W Ratio = 1.32
	Signing and Marking	Improve	Safety	B	$152	$152	C/W Ratio = 1.0
	Permanent Erosion Control	Minimize	Erosion	B	$80	$80	C/W Ratio = 1.0
	Temporary Erosion Control	Minimize	Erosion	B	$678	$500	C/W Ratio = 1.36
	Right-of-Way	Provide	Area	RS	$2,733	$2,733	C/W Ratio = 1.0

Function defined as: **Action Verb** **Measurable Noun**

Kind: B = Basic; S = Secondary; RS = Required Secondary; HO = Higher Order; LO = Lower Order

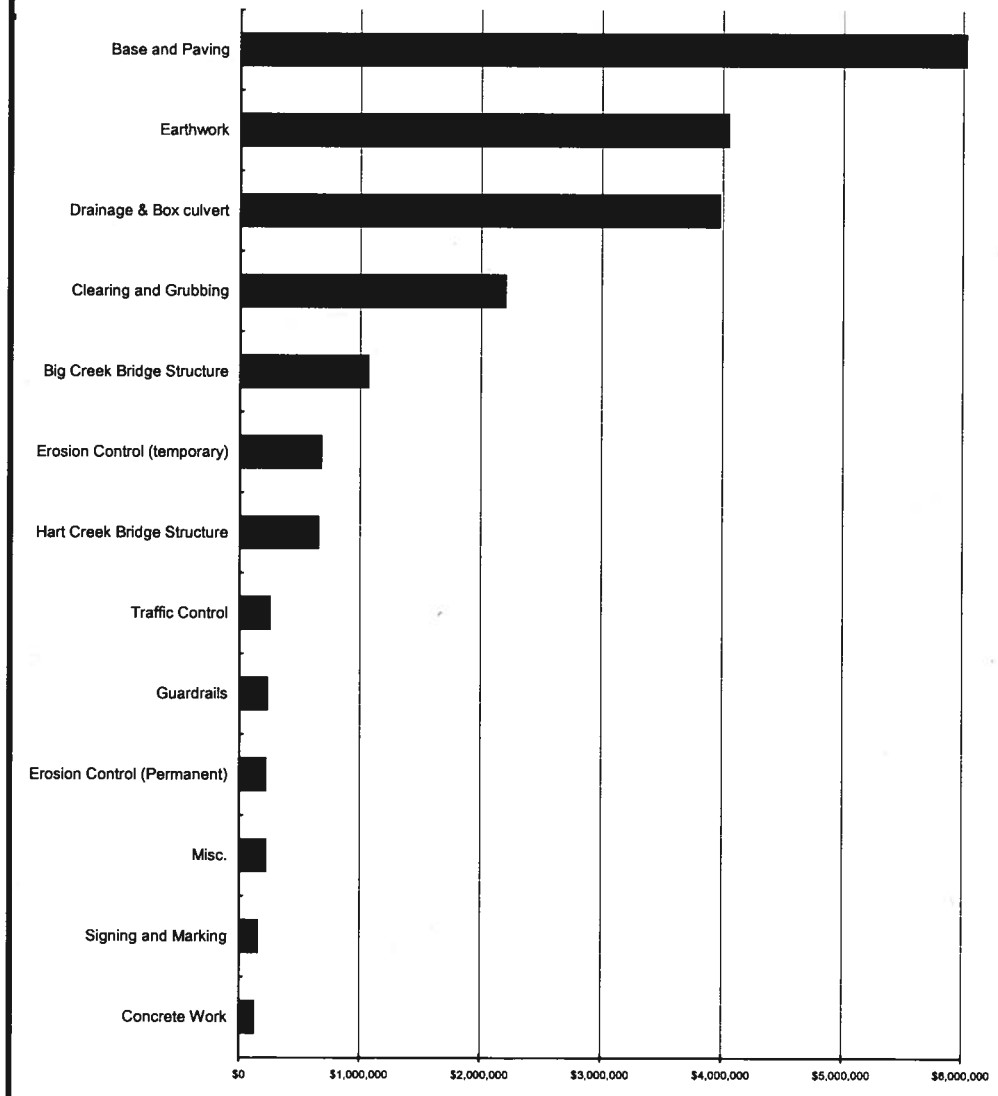
Cost/Worth Ratio = (Total Cost ÷ Basic Worth)

PARETO CHART - COST HISTOGRAM

PROJECT: EDS-545(40), BRN-014-1(73)(74) PI NOS 222250, 227815, 227816

McDuffie County, Georgia

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Base and Paving	$10,976,685	44.15%	44.15%
Earthwork	$4,047,004	16.28%	60.43%
Drainage & Box culvert	$3,973,307	15.98%	76.41%
Clearing and Grubbing	$2,200,000	8.85%	85.26%
Big Creek Bridge Structure	$1,064,404	4.28%	89.54%
Erosion Control (temporary)	$678,265	2.73%	92.27%
Hart Creek Bridge Structure	$653,507	2.63%	94.89%
Traffic Control	$250,000	1.01%	95.90%
Guardrails	$229,369	0.92%	96.82%
Erosion Control (Permanent)	$219,219	0.88%	97.70%
Misc.	$217,754	0.88%	98.58%
Signing and Marking	$152,965	0.62%	99.20%
Concrete Work	$119,744	0.48%	99.68%
Grassing and Landscaping	$80,310	0.32%	100.00%
Subtotal $	**24,862,533**	**100.00%**	
TOTAL $	**24,862,533**		



Designers Presentation Attendance April 16, 2007

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County SHEET NO.: 1 of 1
P.I. No.: 222250, 227815,227816 SR 17 from SR 43 to West of SR 6

NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
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CREATIVE IDEA LIST and EVALUATION

PBSJ

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDUFFIE COUNTY SHEET NO.: 1 of 2

P.I. No.: 222250, 227815,227816

SR 17 FROM SR 43 TO WEST OF SR 6

NO.	IDEA DESCRIPTION	RATING
	ROADWAY (R)	
R-1	Re-evaluate existing pavement analysis and if possible, utilize the existing pavement and profile as is; upgrade existing for "structure" and or "surface course" as needed	4
R-2	Re-align and utilize the existing pavement	1
R-3	Use portions of the existing two-lane road as is where the horizontal alignment permits and construct new two lanes for combined total of 4 travel lanes.	1
R-4	Re-evaluate existing pavement analysis and recommendation for total replacement. If existing is structurally acceptable; then retain the existing in locations where only minor leveling would be required to be at the proposed grade elevation of the current design	2
R-5	Retain as a two lane road, enhance clear zone and add turning and passing lanes as necessary	1
R-6	Idea R-5 plus a center (3rd lane) for passing	1
R-7	Minimize side road tie-in lengths	4
R-8	Re-align "Russell's landing road to the north to reduce earthwork	1
R-9	Re-align proposed new SR 17 alignment to avoid displacement of existing Church	2
R-10	Re-align SR 17 westerly from Hart Bridge to Sta. 305+00 +/- to use existing pavement	1
R-11	Retain existing Ridge Road (Russell's Road) alignment	4
R-12	Mill and overlay existing SR 17	1
R-13	Reduce median width to 32'	1
R-14	Delete type 7 curb and gutter at intersections	ABD
R-15	Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb	DS
R-16	Review cost estimate for bridge removal cost (appears very low), and the quantity of rip rap being called for – appears high	DS
	BIG CREEK BRIDGE (BCB)	
BCB-1	Retain existing bridge; construct new southbound bridge	2
BCB-2	Widen Existing Bridge	1
BCB-3	Construct one new total width bridge in lieu of two new bridges	5
BCB-4	Use "H" in lieu of drilled caissons	4
BCB-5	Use a 32' bridge width design (gutter to gutter)	4

Rating: 1→2 = Generally not acceptable; 3 = Little Opportunity for Positive Change; 4→5 = Most likely to be Developed; DS = Design Suggestion; ABD = Already Being Done

CREATIVE IDEA LIST and EVALUATION

PBSJ

PROJECT: EDS-545(40), BRN-014-1(73)(74) McDuffie County — SHEET NO.: 2 of 2

P.I. No.: 222250, 227815,227816

SR 17 from SR 43 to West of SR 6

NO.	IDEA DESCRIPTION	RATING
	HART CREEK BRIDGE (HCB)	
HCB-1	Construct one new total width bridge in lieu of two new bridges	5
HCB-2	Use "H" in lieu of drilled caissons	4
HCB-3	Use a 32' bridge width design (gutter to gutter)	4
	DRAINAGE (D)	
D-1	Consider Jack & Bore in-lieu of an "open cut" for Stage I construction	DS
D-3	Review and modify construction documents and or staging plan as need be, to transport or route the stormwater runoff from new westerly roadway under the easterly roadway	DS
D-4	Identify location of proposed 28,000 s.y. of proposed rip rap	DS

Rating: 1→2 = Generally not acceptable; 3 = Little Opportunity for Positive Change; 4→5 = Most likely to be Developed; DS = Design Suggestion; ABD = Already Being Done