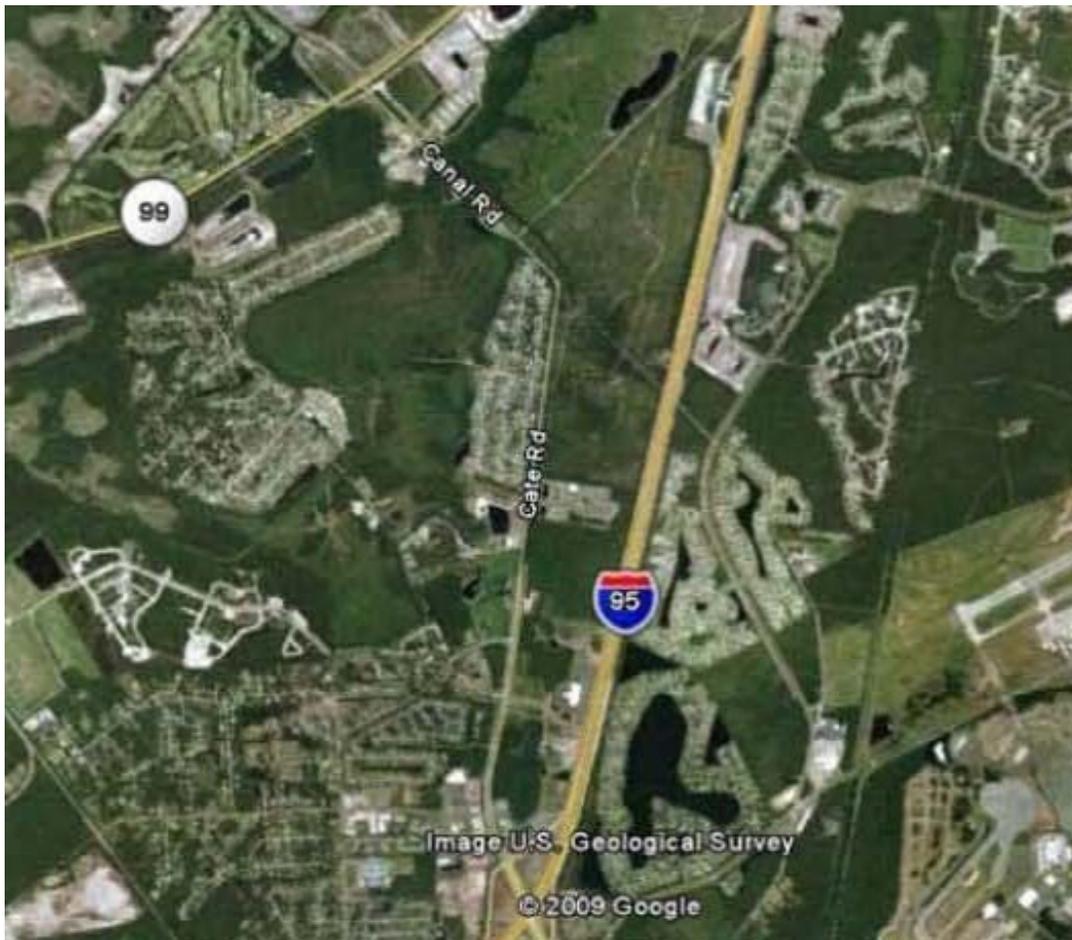


Value Engineering Study Report

*Georgia Department of Transportation
STP00-0000-00(421) – P.I. No. 0000421
SR 25 Spur from Cate Road along
CR 588/Canal Rd. to SR 99
Glynn County*



Value Engineering Team



Design Team



January 28, 2010



January 28, 2010

Ms. Lisa Myers
Design Review Engineer Manager/VE Coordinator
Georgia Department of Transportation-Engineering Services
One Georgia Center
600 W. Peachtree Street NW
Atlanta, GA 30308

RE: Submittal of the final Value Engineering Report
STP00-0000-00(421) – P.I. No. 0000421
SR 25 Spur from Cate Road along CR 588/Canal Road to SR 99
Glynn County

Dear Ms. Myers:

Please find enclosed two (2) hard copies and one (1) CD of our final Value Engineering Report for SR 25 Spur from Cate Road along CR 588/Canal Road to SR 99.

Using the Value Engineering “Job Plan” – Investigation, Analysis (*Function*), Speculation, Evaluation & Development, the VE Team identified:

- Eight (8) Alternatives recommended to improve the project value.

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

A handwritten signature in black ink that reads 'Les M. Thomas'.

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

A handwritten signature in black ink that reads 'Randy S. Thomas'.

Randy S. Thomas, CVS
Assistant Team Leader

Value Engineering Study Report

STP00-0000-00(421) - P.I. No. 000421

**SR 25 Spur from Cate Road along
CR588/Canal Road to SR 99**

Glynn County

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EXECUTIVE SUMMARY

INTRODUCTION

The subject of the Value Engineering study is project STP00-0000-00(421) – P.I. No. 0000421. The project is for the extension and improvements to SR 25 Spur from Cate Road along CR 588/Canal Road to SR 99 in Glynn County. The project also includes significant improvements along SR 99 at the SR25 Spur intersection.

PROJECT DESCRIPTION

This project consists of the extension of SR 25 Spur on 200 feet of proposed Right-of-Way. SR 99 would also be widened from an existing two lane facility to four lanes for approximately 2007 feet to the west and 2428 feet to the east before tapering back to an existing two lane facility on 200 feet of proposed Right-of-Way. The northern terminus for the project is the intersection of SR 99 and Canal Road. The southern terminus is the intersection of Cate Road and SR 25 Spur.

SR 25 Spur is classified as an urban collector. The proposed typical section will consist of two – 12 foot lanes in each direction, a 44 foot depressed grass median, and a 10 foot bike-able shoulder which will be 6.5 foot paved and 3.5 foot grassed on each side. The posted speed limit for SR 25 Spur will be 55 mph.

The length of the project is 2.10 miles for the SR 25 spur extension and 0.84 miles for SR 99 widening.

The project corridor is primarily undeveloped forest land and rural residential.

Because the corridor will be a new roadway, capacity analysis and level of service determinations could not be completed for existing conditions. However, planning level analysis indicates that it would function at level of service B in the future as a four-lane highway.

NEED AND PURPOSE

Traffic volumes are expected to be at 6,000 vpd in 2010 with growth projections at 24,500 vpd in design year 2030. Truck volume is projected at 4%.

The project is included in the local bicycle route for Glynn County.

SR 25 Spur extension will provide an important link in the hurricane evacuation routes for the area. It provides access to I-95 and SR 99 which will aid in the mitigation of traffic during a hurricane evacuation.

The estimated construction cost for the project is projected at \$12,172,277. In addition, Right-of-Way costs are projected at \$407,400 and reimbursable utilities at \$12,500. The projected total cost for the project is \$12,592,177.

The design for the project has been prepared by **Thomas & Hutton Engineering Company**.

PROJECT CONCERNS AND OBJECTIVES

- Increase capacity of existing roadways to accommodate growth
- Minimize impacts to wetlands
- Provide safe separation of traffic

VALUE ENGINEERING PROCESS

The Value Engineering team followed the seven step Value Engineering Job Plan as promulgated by SAVE International.

Using the first two steps of the Value Engineering Job Plan - Investigation & Analysis (*Function Analysis*); the VE Team identified the goal of this project to be “improve safety”.

This led the team through the “Speculative” phase, wherein possible alternatives were identified. Following this, the VE Team moved to the Evaluation and Development Phases where the ideas were determined to either offer an improvement to the project value, or discarded.

Conclusions and Recommendations:

The VE Team concluded that the project should meet the functional requirements of the project as proposed.

The VE Team noted the following items of the project documents which should be reviewed to clarify the project:

1. Item 652-3501 overstates the value of the work by 1,300,000.00
2. The open roadside swales drain in opposite directions Sta. 36 to Sta. 51
3. The quantity of GAB appears to be overstated by 50%
4. The estimate does not reflect total pavement replacement
5. Signal warrants should be reviewed for Cate Road and SR 99 intersections.
6. Should the Type A alternative be selected, it appears possible that when the SR 99 and SR 25 Spur intersection is revisited, the westerly ROW line may be shifted to the east thereby reducing the ROW required.

The VE Team identified, developed and **recommends Eight (8) Design Alternatives** for implementation to improve the value of the project – see the following "*Summary of Alternatives and Design Suggestions*".

Summary of Alternatives & Design Suggestions



PROJECT: **Georgia Department of Transportation**
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

SHEET NO.: **1** of **1**

ALTERNATIVE NUMBER	DESCRIPTION OF ALTERNATIVE	INITIAL COST SAVINGS
	ROADWAY RD)	
RD-1	Eliminate project office; use GDOT area office on site	\$85,250
RD-2	Reduce work on SR 99	\$260,877
RD-5	Utilize 32' median in-lieu of 44'	\$131,955
RD-6	Utilize Type A in-lieu of Type B median crossovers	\$622,292
RD-7	Utilize multi-barrel pipe @ Sta. 99+80 ±	\$77,805
RD-8	Utilize Type A in-lieu of Type B median crossover at Cate Road and SR 25 Spur	\$316,884
RD-10	Use an 11' inside lane/12' outside travel lanes throughout the project	\$117,813
RD-13	Reduce the number of median outfalls	\$62,607

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.

This introductory sheet is followed by a **Summary of Alternatives**. 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 enclosed **Summary of Alternatives** 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.

The 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**.

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-1

DESCRIPTION: **Eliminate project office, use GDOT Area office onsite**

SHEET NO.: **1** of **3**

Original Design:

The original design has a Type 3 Field Engineer's office set up in the contract for an estimated cost of \$77,500.

Alternative Design:

The alternative proposes using the GDOT Area office onsite to accommodate the field engineer's office.

Opportunities:

- Reduce project initial cost

Risks:

- None apparent

Technical Discussion:

The GDOT Area Office is inside the project limits on the south east side. The intent of this alternative is to eliminate the Type 3 Field Engineer's office, and use the existing GDOT Area Office to provide the space from which to manage the project. Preliminary discussions with the GDOT indicate that space is most likely available for this use.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 85,250	\$ 0	\$ 85,250
ALTERNATIVE	\$ 0	\$ 0	\$ 0
SAVINGS	\$ 85,250	\$ 0	\$ 85,250

Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-1

DESCRIPTION: **Eliminate project office, use GDOT Area office onsite**

SHEET NO.: **2** of **3**

Eliminate Pay Item 153-1300- Field Engineer's Office, Type 3 @ estimate of \$77,500. A mark-up would not be plus 10% markup @ \$7,750= \$85,250.

Cost Worksheet



PROJECT: **Georgia Department of Transportation** ALTERNATIVE NO.:
STP00-0004-00(917) - P.I. No. 0004917
SR 25 Spur from Cate Rd. along CR 588/ **RD-1**
Canal Rd. to SR 99
Glynn County

DESCRIPTION: **Eliminate project office, use GDOT Area office** SHEET NO.: **3 of 3**
onsite

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
153-1300- Type 3 Field Engineer's office	EA	1	\$ 77,500	\$ 77,500	0	\$ 77,500	\$ -
Sub-total				\$ 77,500			\$ -
Mark-up at 10.00%				\$ 7,750			\$ -
TOTAL				\$ 85,250			\$ -

Estimated Savings: \$85,250

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-2

DESCRIPTION: **Reduce work on SR-99**

SHEET NO.: **1** of **4**

Original Design:

The original design proposes 4,433 lf of improvements along SR-99.

Alternative Design:

The alternative design proposes to reducing the improvements as follows:

Reduced full depth paving: Station ~189+10 to Station ~194+33.3=> 525 LF

Station ~180+60 to Station ~189+10=> 850 LF

$(525 \text{ LF} \times 68' \text{ wide}) + (850 \text{ LF} \times 12' \text{ wide} / 2) = 40,800 \text{ SF} / (9 \text{ SF/SY}) \Rightarrow 4,535 \text{ SY}$

Reduced shoulder depth paving: Station ~189+10 to Station ~194+33.3=> 525 LF

$(525 \text{ LF} \times 13' \text{ wide}) = 40,800 \text{ SF} / (9 \text{ SF/SY}) \Rightarrow 760 \text{ SY}$

Opportunities:

- Reduce paving costs
- Reduced future maintenance
- Eliminate potential enforcement issue

Risks:

- None apparent

Technical Discussion:

The area proposed for elimination is not necessary for the implementation of the current project and elimination will not adversely affect its operation. While the additional pavement proposed might simplify the future widening to the south, this is a long range project. The additional pavement will likely sit for an extended period without any direct traffic and may be subject to deterioration. The additional pavement may also create a large area of unused pavement that may be attractive to illegal parking and may potentially create a safety issue.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 260,887	\$ 0	\$ 260,887
ALTERNATIVE	\$ 0	\$ 0	\$ 0
SAVINGS	\$ 260,887	\$ 0	\$ 260,887

Illustrations

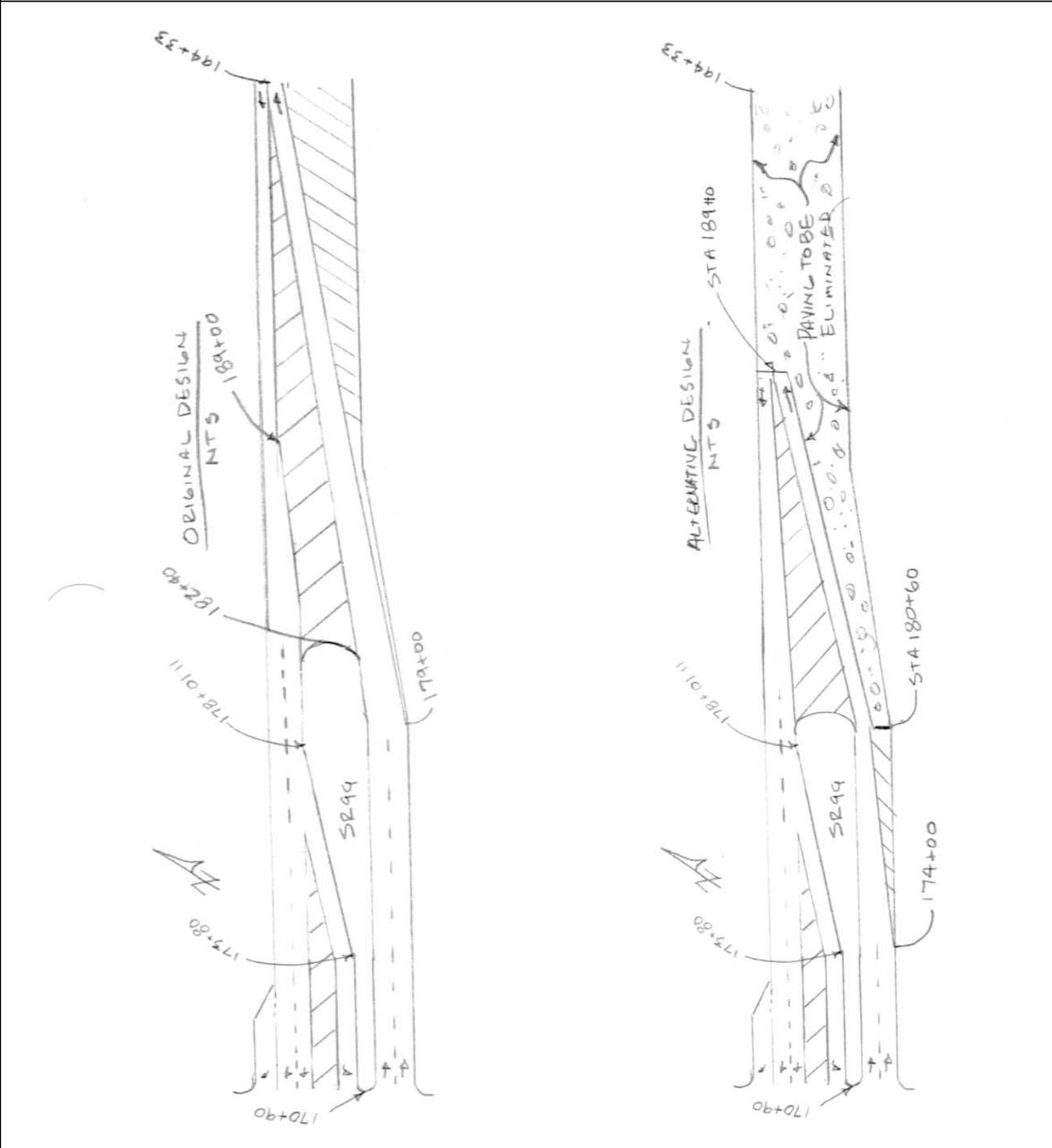


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-2

DESCRIPTION: Reduce work on SR-99

SHEET NO.: 2 of 4



Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-2

DESCRIPTION: **Reduce work on SR-99**

SHEET NO.: **3** of **4**

Reduced full depth paving: Station ~189+10 to Station ~194+33.3=> 525 LF
Station ~180+60 to Station ~189+10=> 850 LF
(525 LF x 68' wide)+(850 LF x 12'wide/2) = 40,800SF/ (9 SF/SY) => 4,535 SY

Reduced shoulder depth paving: Station ~189+10 to Station ~194+33.3=> 525 LF
(525 LF x 13' wide) = 40,800SF/ (9 SF/SY) => 760 SY

Paving-

Superpave 12.5mm	=	[(4,535 SY+760 SY) x 220#/SY-IN / (2000#/Ton)]	=> 582 TN
Superpave 19.0mm	=	[(4,535 SY+760SY) x 220#/SY-IN / (2000#/Ton)]	=> 582 TN
Superpave 25.0mm	=	[(4,535 SY+760SY) x 330#/SY-IN / (2000#/Ton)]	=> 874 TN
6" GAB	=	760 SY	
8" GAB	=	4,535 SY	

Earthwork-

(525 LF / 11,830 LF) => 0.0444%

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588/ Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.: RD-2
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DESCRIPTION:	Reduce work on SR-99	SHEET NO.: 4 of 4
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CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
12.5 mm Superpave	TN	582	\$ 65.00	\$ 37,830	0	\$ 65.00	\$ -
19.0 mm Superpave	TN	582	\$ 70.00	\$ 40,740	0	\$ 70.00	\$ -
25.0 mm Superpave	TN	874	\$ 60.00	\$ 52,440	0	\$ 60.00	\$ -
8" GAB	SY	4,535	\$ 16.00	\$ 72,560	0	\$ 16.00	\$ -
6" GAB	SY	760	\$ 15.00	\$ 11,400	0	\$ 15.00	\$ -
Earthwork	LS	0.0444	\$500,000	\$ 22,200	0	\$500,000	\$ -
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
Sub-total				\$ 237,170			\$ -
Mark-up at 10.00%				\$ 23,717			\$ -
TOTAL				\$ 260,887			\$ -

Estimated Savings:	\$260,887
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Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-5

DESCRIPTION: **Utilize 32' median in-lieu of 44' median**

SHEET NO.: **1** of **4**

Original Design:

The original design proposes constructing a 44' grassed depressed median throughout the project.

Alternative Design:

The alternative design proposes using a 32' grassed depressed median in-lieu of the originally designed 44' grassed depressed median.

Opportunities:

- Reduction in grading/earthwork
- Reduction in ROW required
- Reduces future maintenance area

Risks:

- None apparent

Technical Discussion:

The alternative proposes narrowing the median from 44' to 32' throughout the project. A reduction of 12' in the median width will not reduce the functional requirements of the clear zone, and should not have an adverse impact on vehicular traffic.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 880,440	\$ 0	\$ 880,440
ALTERNATIVE	\$ 748,485	\$ 0	\$ 748,485
SAVINGS	\$ 131,955	\$ 0	\$ 131,955

Illustrations



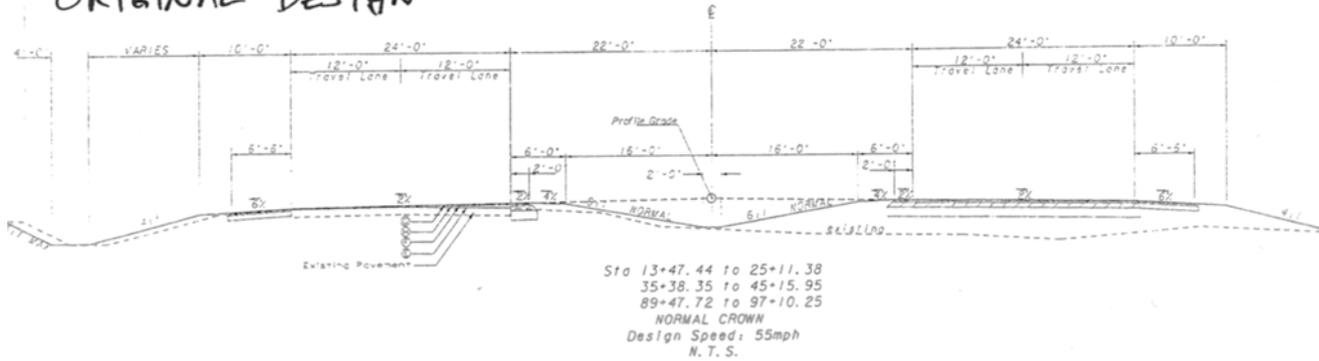
PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-5

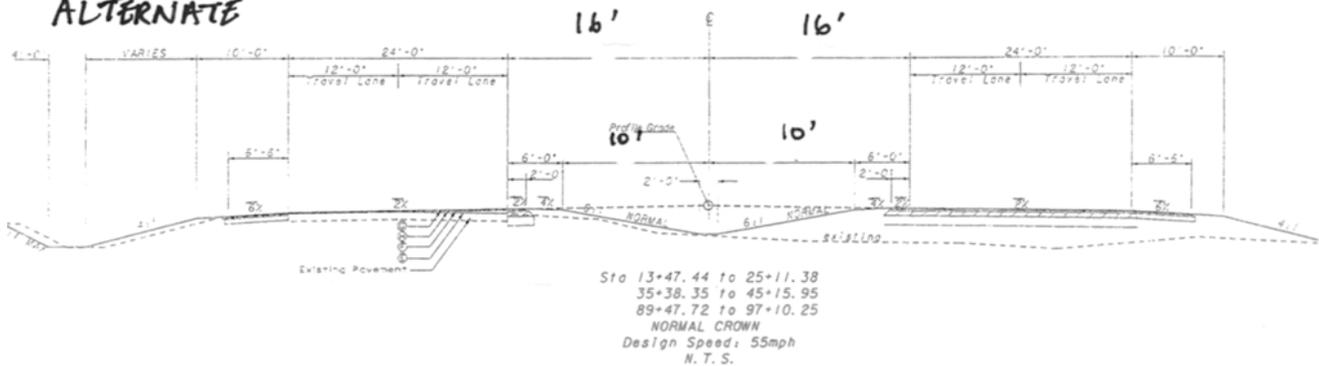
DESCRIPTION: Utilize 32' median in-lieu of 44' median

SHEET NO.: 2 of 4

ORIGINAL DESIGN



ALTERNATE



NARROW MEDIAN TO 32' NOMINAL WIDTH

Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-5

DESCRIPTION: **Utilize 32' median in-lieu of 44' median**

SHEET NO.: **3** of **4**

Assumptions:

The reduction of median width from 44' to 32' will result in savings for grading, and shorten the lengths of pipe required to outfall median inlets.

Since the majority of the ROW required throughout the project has been donated, no ROW savings were calculated in this alternative by narrowing the median.

Reduction in width = $32'/44' = 0.73 = 27\%$ reduction in median width.

Therefore a conservative estimate of 15% of grading and pipe is assumed by the implementation of this alternative.

See Sheet 4 for proportional reductions.

Cost Worksheet



PROJECT: Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588/ Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.: RD-5
DESCRIPTION: Utilize 32' median in lieu of 44' median	SHEET NO.: 4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
18" Storm Drain Pipe	LF	3,650	\$ 53.00	\$ 193,450	3,103	\$ 53.00	\$ 164,459
24" Storm Drain Pipe	LF	350	\$ 55.00	\$ 19,250	298	\$ 55.00	\$ 16,390
30" Storm Drain Pipe	LF	400	\$ 90.00	\$ 36,000	340	\$ 90.00	\$ 30,600
36" Storm Drain Pipe	LF	550	\$ 94.00	\$ 51,700	468	\$ 94.00	\$ 43,992
Grading Complete	LS	1	\$ 500,000	\$ 500,000	0.85	\$ 500,000	\$ 425,000
Sub-total				\$ 800,400			\$ 680,441
Mark-up at 10.00%				\$ 80,040			\$ 68,044
TOTAL				\$ 880,440			\$ 748,485

Estimated Savings:	\$131,955
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Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-6

DESCRIPTION: **Use Type "A" in-lieu of a Type "B" median crossovers**

SHEET NO.: **1 of 4**

Original Design:

The original design proposes to replace the existing Cate Road Type "A" median crossover with a Type "B" median crossover and to construct all Type "B" median crossovers with eyebrows at all intersections.

Alternative Design:

The alternative design would be to retain the existing Cate Road Type "A" median crossover and to construct all Type "A" median crossovers for the project.

Opportunities:

- Reduce the initial construction cost
- Reduce the construction duration
- Reduce the impacts to users during construction

Risks:

- None apparent

Technical Discussion:

The GDOT Standards state that Type "B" median crossovers are the preferred type of median crossover; but that Type "A" median crossovers can be used as the situation may allow. Based on the Traffic Study information, using the Type "A" median crossovers should be acceptable. The roadway has little of no commercial development, flat terrain and relatively low truck traffic volumes (4 %) so sight obstructions at the intersections should be minimal.

Also, using the Type "A" median crossover, the majority of the traffic should be able to make "U" turns without requiring "eyebrows".

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 912,469	\$ 0	\$ 912,469
ALTERNATIVE	\$ 272,536	\$ 0	\$ 272,536
SAVINGS	\$ 639,933	\$ 0	\$ 639,933

Illustrations

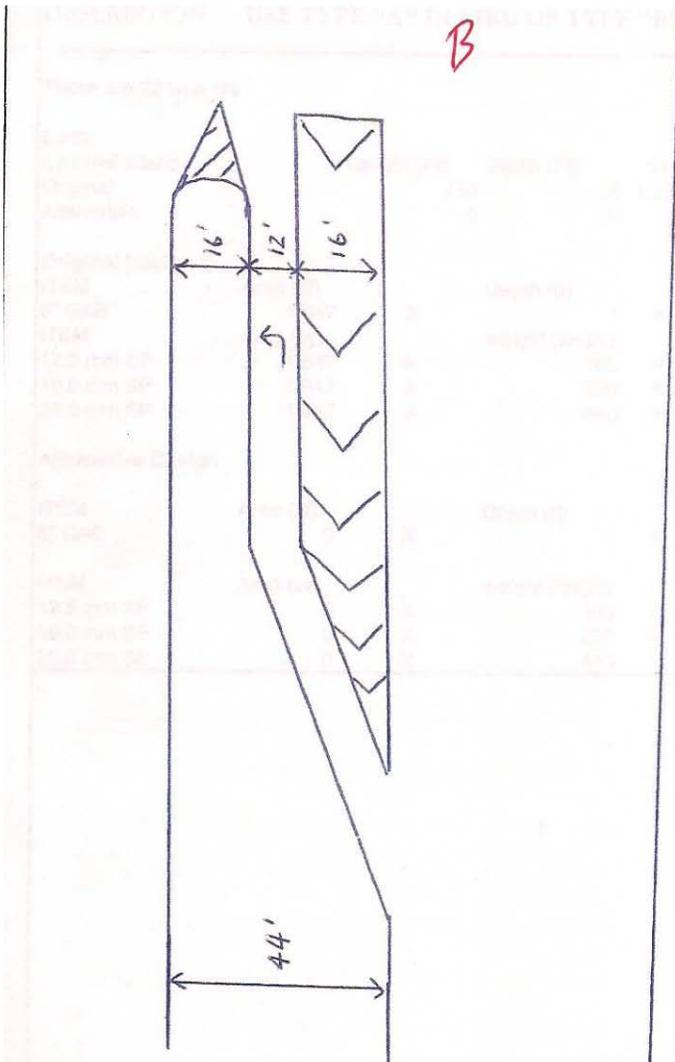


PROJECT: Georgia Department of Transportation
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SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

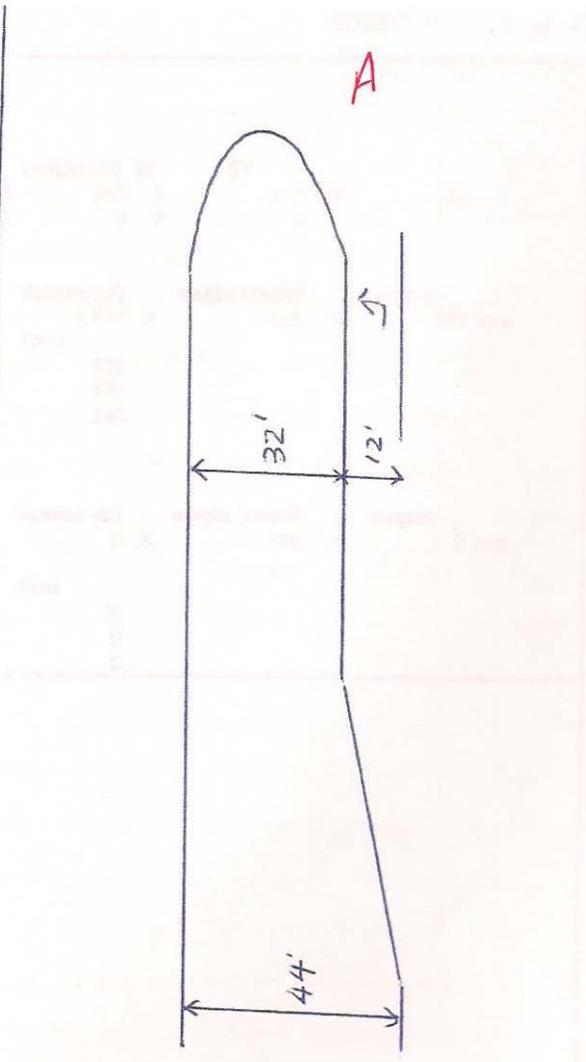
ALTERNATIVE NO.:
RD-6

DESCRIPTION: Use Type "A" in-lieu of a Type "B" median crossovers

SHEET NO.: 2 of 4



Original Design



VE Alternative

Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-6

DESCRIPTION: **Use Type "A" in-lieu of a Type "B" median crossovers**

SHEET NO.: **3** of **4**

		Storage length	Storage Width	Taper Length	Taper Width	Paved Area - SY	lbs/sy	Tons
Type B Turn Lane								
12.5 mm Superpave	TN	180	28	420	28	933.3	220	103
19.0 mm Superpave	TN	180	28	420	28	933.3	220	103
25.0 mm Superpave	TN	180	28	420	28	933.3	330	154
GAB	SY	180	28	420	28	933.3		

		Storage length	Storage Width	Taper Length	Taper Width	Paved Area - SY	lbs/sy	Tons
Type A turn lane								
12.5 mm Superpave	TN	150	12	180	28	380	220	42
19.0 mm Superpave	TN	150	12	180	28	380	220	42
25.0 mm Superpave	TN	150	12	180	28	380	330	63
GAB	SY	150	12	180	28	380		

Pavement to be removed and replaced - SR-25 & Cate Rd		from sta	to sta	Length	width	Paved Area- SY	lbs/sy	Tons
12.5 mm Superpave	TN	52	1147	1095	48	5840	220	642
19.0 mm Superpave	TN	52	1147	1095	48	5840	220	642
25.0 mm Superpave	TN	52	1147	1095	48	5840	330	964
GAB	SY	52	1147	1095	48	5840		
Remove existing pavement	SY	52	1147	1095	48	5840		

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588 Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.:	RD-6
DESCRIPTION:	Use Type "A" in-lieu of a Type "B" median crossovers	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Use Type A in-lieu of Type B				Type B			Type A
12.5 mm Superpave	TN	103	\$ 65.00	\$ 6,673	42	\$ 65.00	\$ 2,717
19.0 mm Superpave	TN	103	\$ 70.00	\$ 7,187	42	\$ 70.00	\$ 2,926
25.0 mm Superpave	TN	154	\$ 60.00	\$ 9,240	63	\$ 60.00	\$ 3,762
GAB	SY	933	\$ 16.00	\$ 14,933	380	\$ 16.00	\$ 6,080
				\$ -			\$ -
Cost for Each Type B - A				\$ 38,033			\$ 15,485
Number of each type	EA	15	\$ 38,033.33	\$ 570,500	15	\$ 15,485.00	\$ 232,275
Reconstruct Existing Cate Rd Intersection							
12.5 mm Superpave	TN	642	\$ 65.00	\$ 41,756	42	\$ 65.00	\$ 2,717
19.0 mm Superpave	TN	642	\$ 70.00	\$ 44,968	42	\$ 70.00	\$ 2,926
25.0 mm Superpave	TN	964	\$ 60.00	\$ 57,816	63	\$ 60.00	\$ 3,762
GAB	SY	5,840	\$ 16.00	\$ 93,440	380	\$ 16.00	\$ 6,080
Remove existing pavement	LS	1	\$ 5,000.00	\$ 5,000	0	\$ 5,000.00	\$ -
Sub-total				\$ 813,480			\$ 247,760
Mark-up at 10.00%				\$ 81,348			\$ 24,776
TOTAL				\$ 894,828			\$ 272,536

Estimated Savings:	\$622,292
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Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-7

DESCRIPTION: **Utilize a multi-barrel pipe at Station 99+80 +/-**

SHEET NO.: **1** of **2**

Original Design:

The original design proposes a 155' 8'x4' box culvert.

Alternative Design:

The alternative design would propose using a triple 48" RCP.

Opportunities:

- Reduce costs
- Simplify construction
- Reduce environmental impacts

Risks:

- None Apparent

Technical Discussion:

A triple 48" RCP will provide the hydraulic equivalent of an 8'x4' box culvert. In addition to being less expensive it can be constructed more rapidly and will be simpler to construct half at a time. Due to the speed and ease of construction it should also reduce siltation of the streambed.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 150,590	\$ 0	\$ 150,590
ALTERNATIVE	\$ 72,785	\$ 0	\$ 72,785
SAVINGS	\$ 77,805	\$ 0	\$ 77,805

Cost Worksheet



PROJECT: **Georgia Department of Transportation** ALTERNATIVE NO.:
STP00-0004-00(917) - P.I. No. 0004917
SR 25 Spur from Cate Rd. along CR 588/ **RD-7**
Canal Rd. to SR 99

DESCRIPTION: **Glynn County** SHEET NO.: **2 of 2**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
				\$ -			\$ -
48" RCP	LF	0	\$ 109.33	\$ -	465	\$ 109.33	\$ 50,838
48" FES	EA	0	\$ 2,555.00	\$ -	6	\$ 2,555.00	\$ 15,330
Class "A" Concrete	CY	180	\$ 550.00	\$ 99,000	0	\$ 550.00	\$ -
Steel Reinforcing	LBS	18,950	\$ 2.00	\$ 37,900	0	\$ 2.00	\$ -
Sub-total				\$ 136,900			\$ 66,168
Mark-up at 10.00%				\$ 13,690			\$ 6,617
TOTAL				\$ 150,590			\$ 72,785

Estimated Savings: \$77,805

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-8

DESCRIPTION: **Use a Type "A" in-lieu of a Type "B" median cross over at
Cate Road and SR 25 Spur**

SHEET NO.: 1 of 4

Original Design:

The original design proposes to replace the existing Type "A" median cross over with a Type "B" median cross over and to construct a type "B" median crossover with an eyebrow at the existing northern portion of the intersection to allow southbound traffic to make a "U" turn.

Alternative Design:

The alternative design would be to maintain the existing intersection alignment and retain the existing intersection, as is, including the existing Type "A" median cross over, and the existing southbound right turn lane. New construction would only be for a "U" turn lane for the southbound lane utilizing a Type "A" median crossover in-lieu of a type B.

Opportunities:

- Reduce the initial construction cost
- Reduce the construction duration
- Reduce the impacts to users during construction
- Reduce the demolition of existing functioning facilities

Risks:

- None apparent

Technical Discussion:

The GDOT Standards state that Type "B" median crossovers are the preferred type of median crossover; but that Type "A" median crossovers can be used as the situation may allow. Based on the Traffic Study information, using the Type "A" median crossovers should be acceptable. The roadway has little of no commercial development, flat terrain and relatively low truck traffic volumes (4 %) so sight obstructions at the intersections should be minimal.

Also, using the Type "A" median crossover, the majority of the traffic should be able to make "U" turns without requiring "eyebrows"

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 350,951	\$ 0	\$ 350,951
ALTERNATIVE	\$ 34,067	\$ 0	\$ 34,067
SAVINGS	\$ 316,884	\$ 0	\$ 316,884

Illustrations

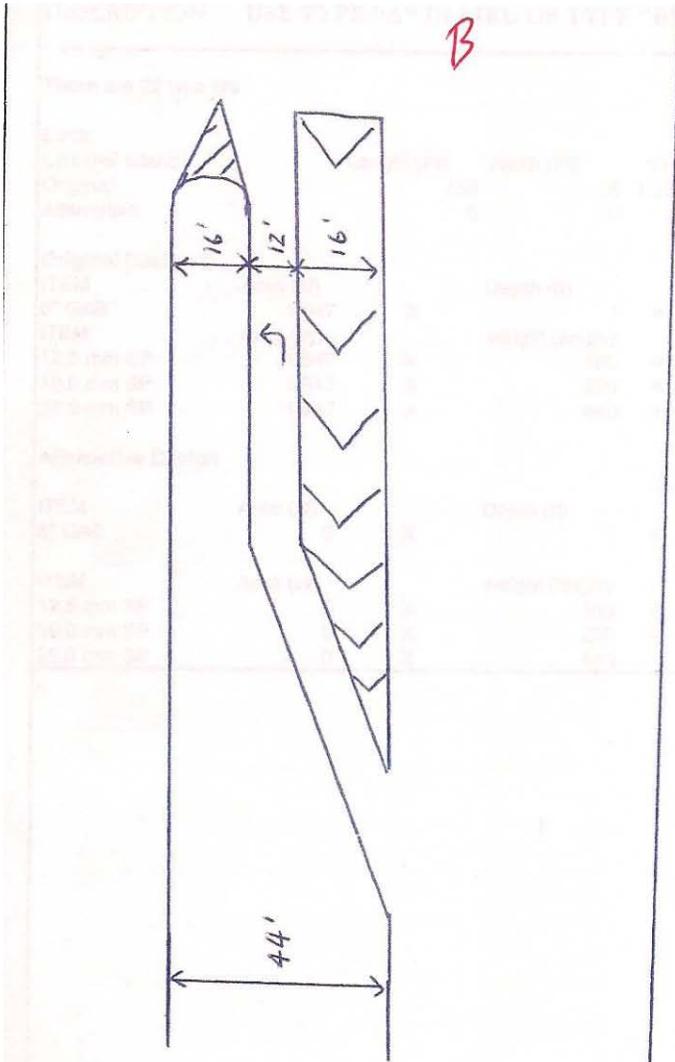


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

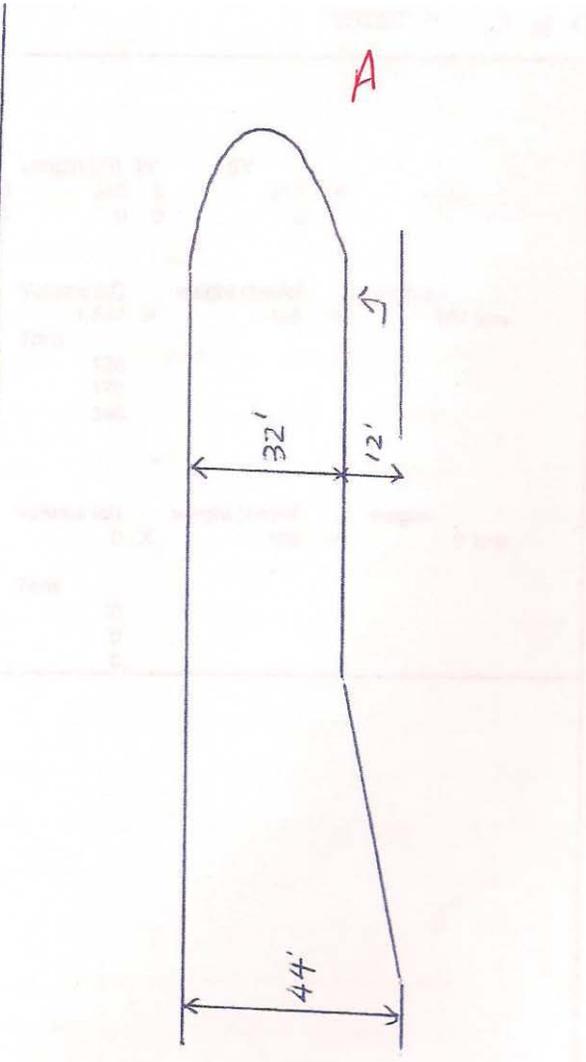
ALTERNATIVE NO.:
RD-8

DESCRIPTION: Use a Type "A" in-lieu of a Type "B" median cross over at
Cate Road and SR 25 Spur

SHEET NO.: 2 of 4



Original Design



VE Alternative

Calculations



**PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

**ALTERNATIVE NO.:
RD-8**

**DESCRIPTION: Use a Type "A" in-lieu of a Type "B" median cross over at
Cate Road and SR 25 Spur**

SHEET NO.: 3 of 4

		Storage length	Storage Width	Taper Length	Taper Width	Paved Area - SY	lbs/sy	Tons
Type B Turn Lane								
12.5 mm Superpave	TN	180	28	420	28	933.3	220	103
19.0 mm Superpave	TN	180	28	420	28	933.3	220	103
25.0 mm Superpave	TN	180	28	420	28	933.3	330	154
GAB	SY	180	28	420	28	933.3		

		Storage length	Storage Width	Taper Length	Taper Width	Paved Area - SY	lbs/sy	Tons
Type A turn lane								
12.5 mm Superpave	TN	150	12	180	28	380	220	42
19.0 mm Superpave	TN	150	12	180	28	380	220	42
25.0 mm Superpave	TN	150	12	180	28	380	330	63
GAB	SY	150	12	180	28	380		

		from sta	to sta	Length	width	Paved Area - SY	lbs/sy	Tons
Pavement to be removed and replaced - SR 25 & Cate								
12.5 mm Superpave	TN	52	1147	1095	48	5840	220	642
19.0 mm Superpave	TN	52	1147	1095	48	5840	220	642
25.0 mm Superpave	TN	52	1147	1095	48	5840	330	964
GAB	SY	52	1147	1095	48	5840		
Remove existing pavement	SY	52	1147	1095	48	5840		

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588 Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.:	RD-8
DESCRIPTION:	Use a Type "A" in-lieu of a Type "B" median cross over at Cate Road and SR 25 Spur	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Use Type A in-lieu of Type B				Type B			Type A
12.5 mm Superpave	TN	103	\$ 65.00	\$ 6,673	42	\$ 65.00	\$ 2,717
19.0 mm Superpave	TN	103	\$ 70.00	\$ 7,187	42	\$ 70.00	\$ 2,926
25.0 mm Superpave	TN	154	\$ 60.00	\$ 9,240	63	\$ 60.00	\$ 3,762
GAB	SY	933	\$ 16.00	\$ 14,933	380	\$ 16.00	\$ 6,080
				\$ -			\$ -
Cost for Each Type B - A				\$ 38,033			\$ 15,485
Number of each type	EA	2	\$38,033	\$ 76,067	1	15,485	\$ 15,485
Reconstruct Existing Cate Rd Intersection							
12.5 mm Superpave	TN	642	\$ 65.00	\$ 41,756	42	\$ 65.00	\$ 2,717
19.0 mm Superpave	TN	642	\$ 70.00	\$ 44,968	42	\$ 70.00	\$ 2,926
25.0 mm Superpave	TN	964	\$ 60.00	\$ 57,816	63	\$ 60.00	\$ 3,762
GAB	SY	5,840	\$ 16.00	\$ 93,440	380	\$ 16.00	\$ 6,080
Remove existing pavement	LS	1	5000	5000	0	5000	\$ -
Sub-total				\$ 319,047			\$ 30,970
Mark-up at 10.00%				\$ 31,905			\$ 3,097
TOTAL				\$ 350,951			\$ 34,067

Estimated Savings: \$316,884

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County** ALTERNATIVE NO.: **RD-10**

DESCRIPTION: **Use 11' inside, 12' outside travel lanes throughout project** SHEET NO.: **1 of 4**

Original Design:

The original design calls for two-12' travel lanes in each direction throughout the proposed project.

Alternative Design:

The alternative design proposes using an 11' inside lane, and a 12' outside lane throughout the project.

Opportunities:

- Reduction of 2' full depth pavement width

Risks:

- None apparent

Technical Discussion:

The alternative proposes narrowing the inside lanes in both directions to a 11' width, while constructing the outside lanes at the originally proposed 12' width. The resulting savings below are accounted by the savings of 1' of full depth pavement being eliminated in both directions throughout the project. The design speed for the proposed project is 55 mph; however truck volume is relatively low at 4%. Constructing the outside lane at 12' would allow extra width for the 4% truck traffic. Although the roadway is a State Route it is classified as an Urban Collector and not an Arterial.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 6,320,710	\$ 0	\$ 6,320,710
ALTERNATIVE	\$ 6,202,897	\$ 0	\$ 6,202,897
SAVINGS	\$ 117,813	\$ 0	\$ 117,813

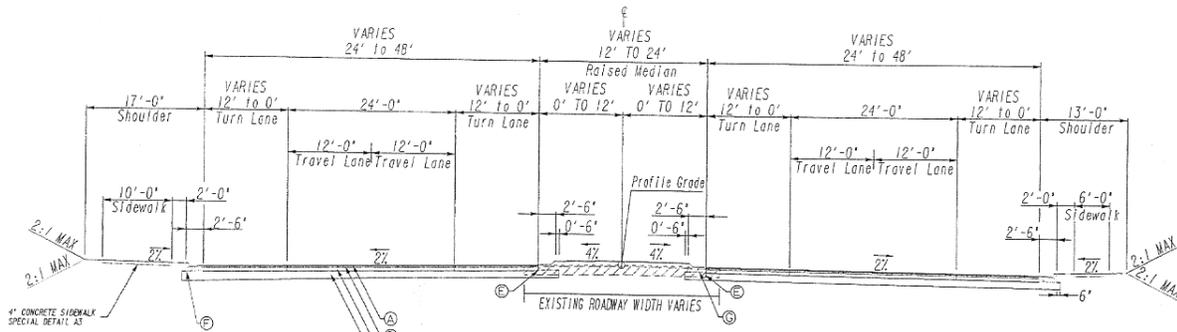
Illustrations



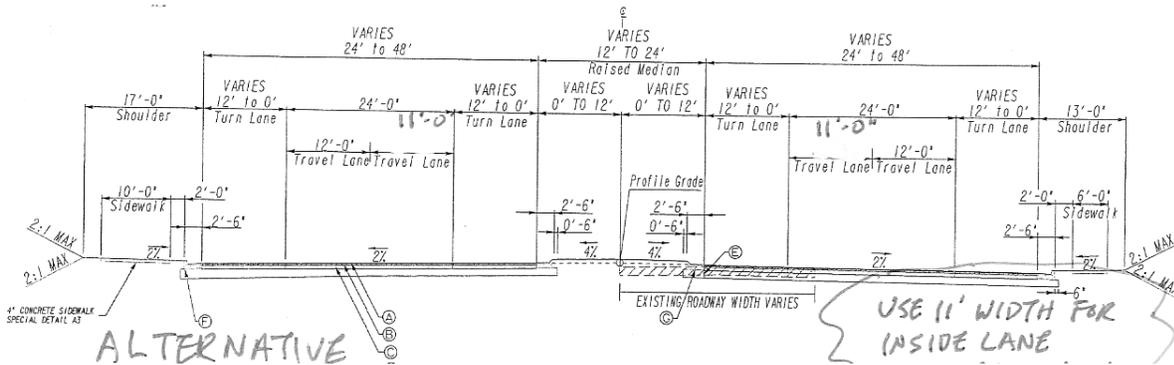
PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-10

DESCRIPTION: **Use 11' inside, 12' outside travel lanes throughout project** SHEET NO.: **2 of 4**



Current Design



Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-10

DESCRIPTION: **Use 11' inside, 12' outside travel lanes throughout project** SHEET NO.: **3** of **4**

Assumptions:

- Reduce full depth paving for 1' in both directions throughout the length of the project.
- Project length-2.24 miles x 5280'=11,827LF x 2'=23,654/9=2,628SY total area of pavement reduction.
- Pavement build-up per typical sections=

GAB=8" thickness

25mm Superpave-330LB/SY

19mm Superpave-220LB/SY

12.5mm Superpave-220LB/SY

Pavement quantity reductions-

GAB- reduce by 2,628 SY

25mm Superpave- 330LB/SY x 2,628SY/2,000=434 ton reduction

19mm Superpave- 220LB/SY x 2,628SY/2,000=289 ton reduction

12.5mm Superpave- 220 LB/SY x 2,628SY/2,000=289 ton reduction

Cost Worksheet



PROJECT: Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588/ Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.: RD-10
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DESCRIPTION: Use 11' inside, 12' outside travel lanes	SHEET NO.: 4 of 4
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CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
GAB, 8"	SY	101,600	\$ 16.00	\$ 1,625,600	98,972	\$ 16.00	\$ 1,583,552
25mm Superpave	TN	20,800	\$ 60.00	\$ 1,248,000	20,366	\$ 60.00	\$ 1,221,960
19mm Superpave	TN	20,700	\$ 70.00	\$ 1,449,000	20,411	\$ 70.00	\$ 1,428,770
12.5mm Superpave	TN	21,900	\$ 65.00	\$ 1,423,500	21,611	\$ 65.00	\$ 1,404,715
Sub-total				\$ 5,746,100			\$ 5,638,997
Mark-up at 10.00%				\$ 574,610			\$ 563,900
TOTAL				\$ 6,320,710			\$ 6,202,897

Estimated Savings:	\$117,813
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Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-13

DESCRIPTION: **Reduce the number of median inlets and outfalls**

SHEET NO.: **1** of **8**

Original Design:

The original design proposes median inlets at Stations 22+10, 68+50, 99+50, 177+50 and 178+50.

The original design also includes a longitudinal drainage system from P1-P2-Q1.

Alternative Design:

The alternative design would propose eliminating those inlets and their corresponding outfall at or extremely close to a crest vertical curve. It would also propose eliminating the closed drainage system P1-P2-Q1 and draining these inlets to the side ditch.

Opportunities:

- Reduce structure cost
- Reduce maintenance cost

Risks:

- None apparent

Technical Discussion:

Five inlets are located at or in close proximity to the crest vertical curve. These inlets would carry little or no water except in the most severe storms when the median ditch was completely inundated. If the extra capacity were needed it would be recommended that the designer utilize a flanking inlet at the sag and possibly steepen the median ditch grade. It should also be noted that all the vertical curves have “K” values less than 120 which is substantively less than the recommended “maximum K” for drainage of 167.

The longitudinal drainage system from P1-P2-Q1 could be routed to the ditch on the west side of the roadway. It should be noted that there is excess right of way in this area.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 103,857	\$ 0	\$ 103,857
ALTERNATIVE	\$ 41,250	\$ 0	\$ 41,250
SAVINGS	\$ 62,607	\$ 0	\$ 62,607

Illustrations

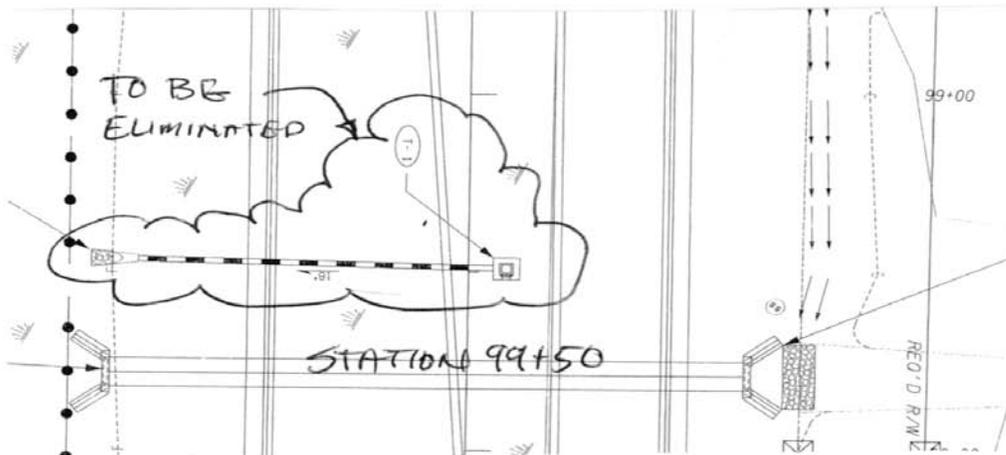
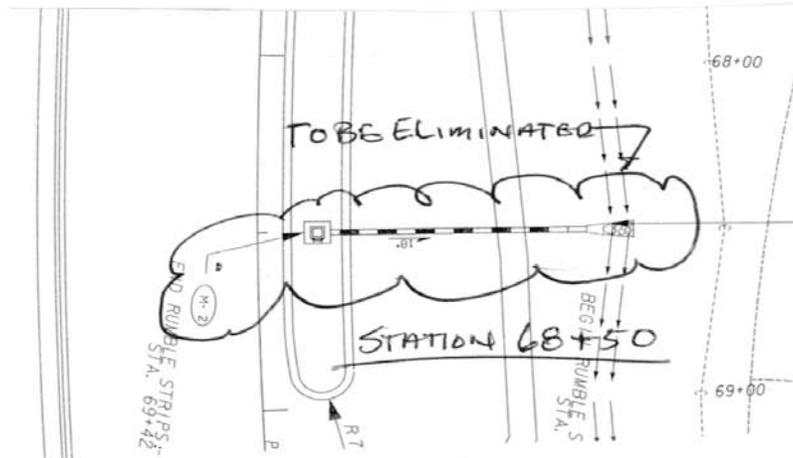
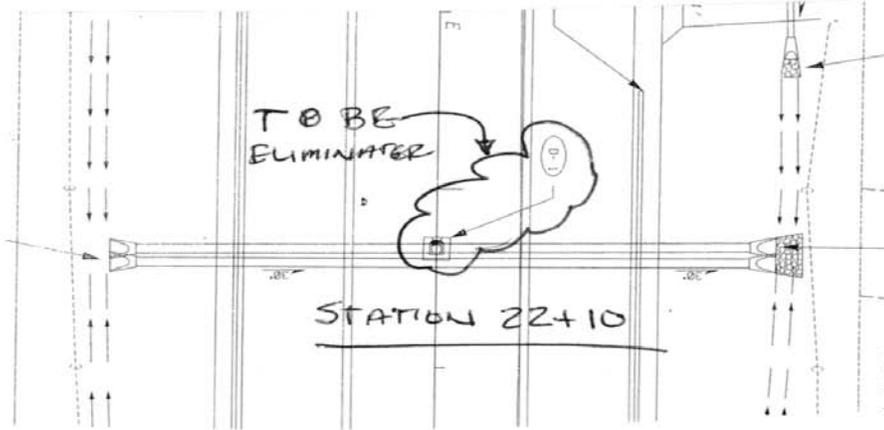


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-13

DESCRIPTION: Reduce the number of median inlets and outfalls

SHEET NO.: 2 of 8



Illustrations

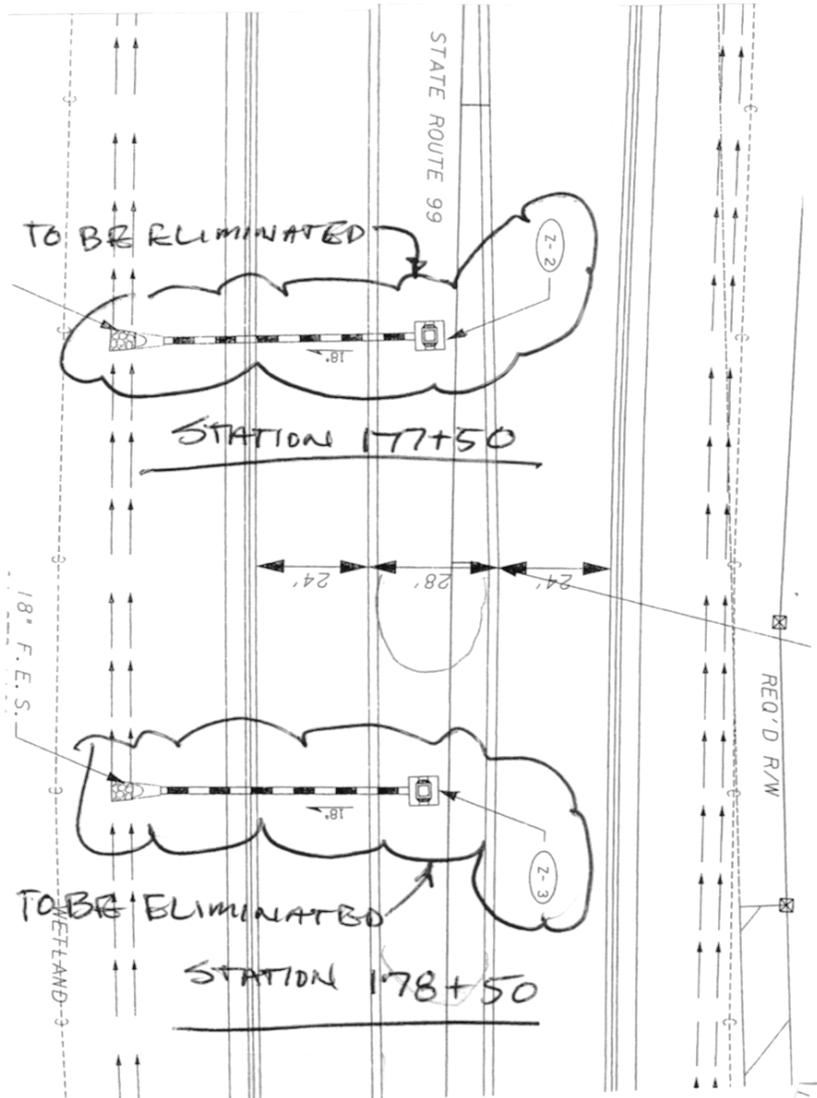


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-13

DESCRIPTION: Reduce the number of median inlets and outfalls

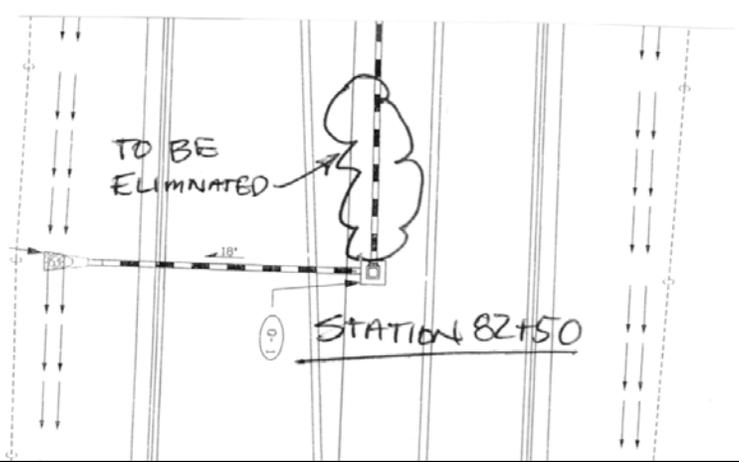
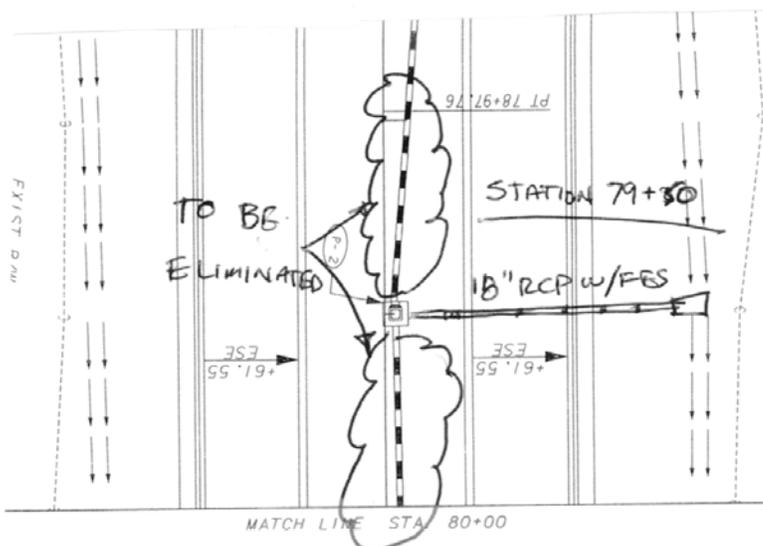
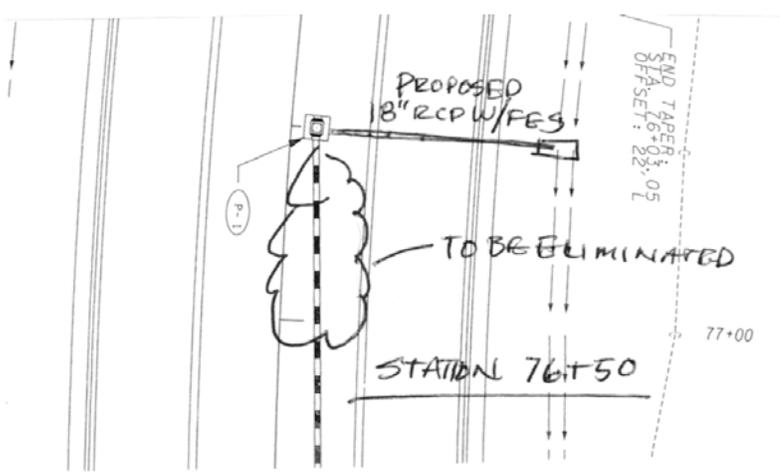
SHEET NO.: 3 of 8



Illustrations



PROJECT:	Georgia Department of Transportation STP00-00-0000-00(421)- P.I. No. 0000421 SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99 Glynn County	ALTERNATIVE NO.:	RD-13
DESCRIPTION:	Reduce the number of median inlets and outfalls	SHEET NO.:	4 of 8



Illustrations

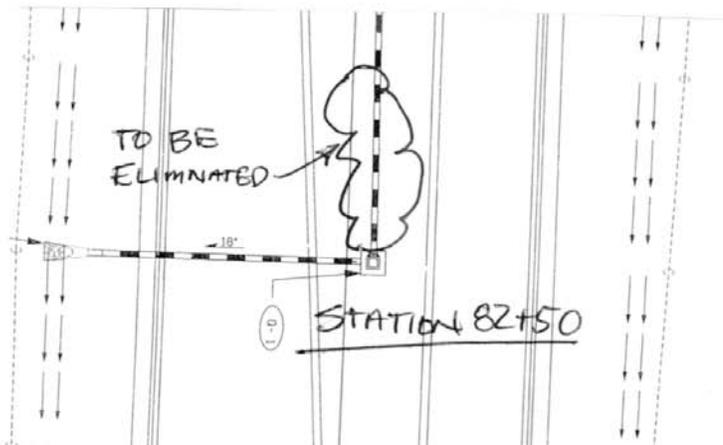
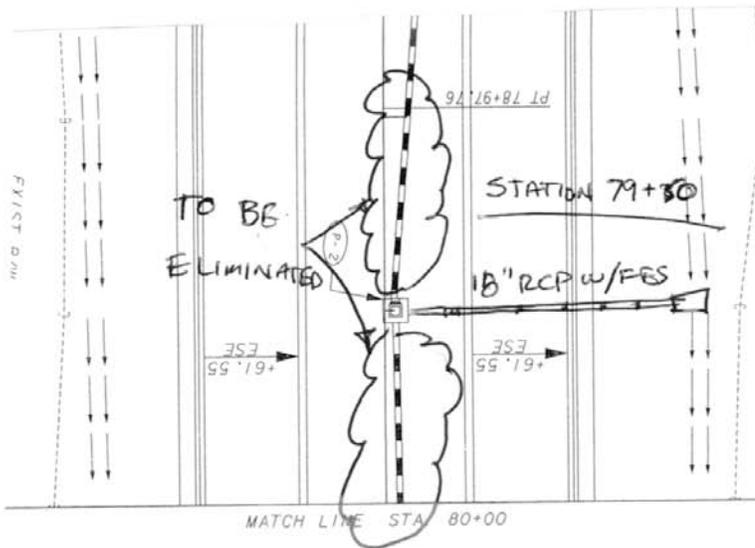
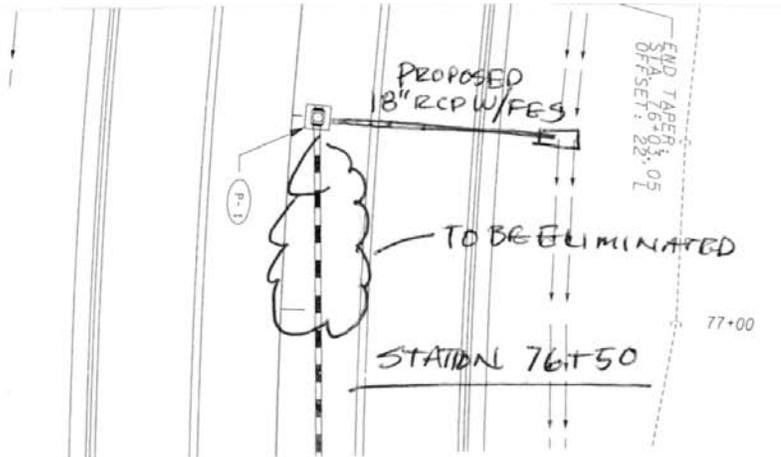


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-13

DESCRIPTION: Reduce the number of median inlets and outfalls

SHEET NO.: 5 of 8



Illustrations

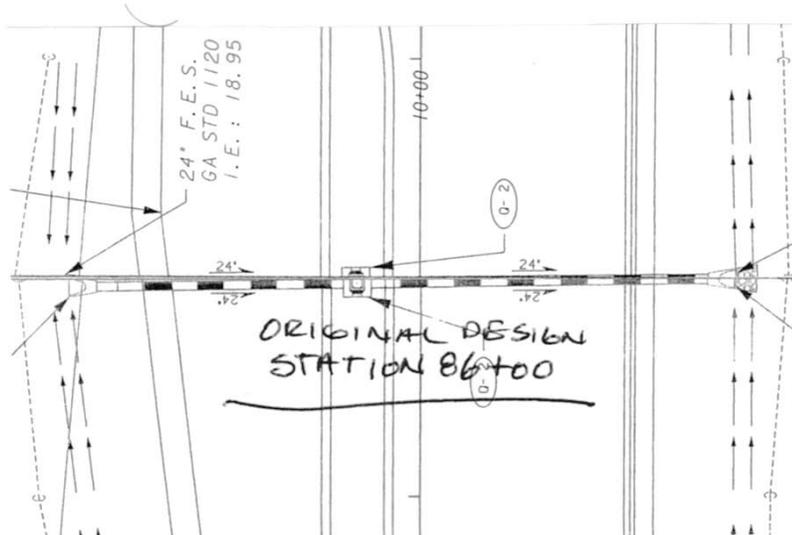
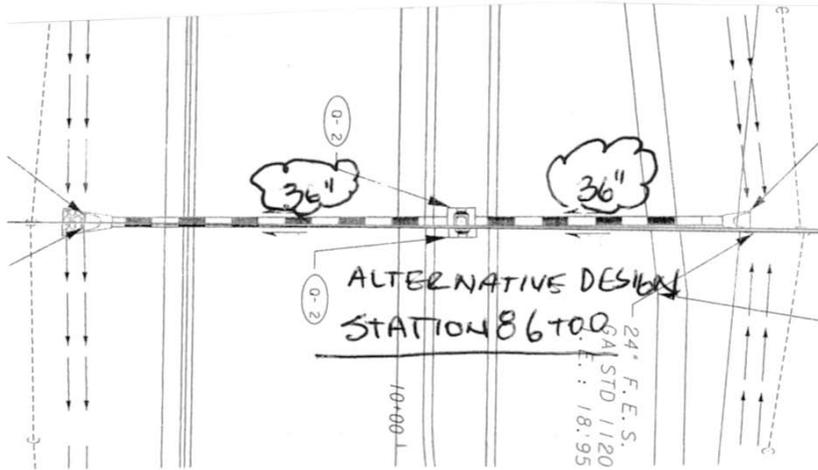


PROJECT: Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County

ALTERNATIVE NO.:
RD-13

DESCRIPTION: Reduce the number of median inlets and outfalls

SHEET NO.: 6 of 8



Calculations



PROJECT: **Georgia Department of Transportation
STP00-00-0000-00(421)- P.I. No. 0000421
SR 25 Spur from Cate Rd. along CR 588/Canal Rd. to SR 99
Glynn County**

ALTERNATIVE NO.:
RD-13

DESCRIPTION: **Reduce the number of median inlets and outfalls**

SHEET NO.: **7** of **8**

Original design

Station 21+50 - Drop Inlet 1 each
Station 68+50 - Drop Inlet 1 each
18" RCP 65 lf
18" FES 1 each
TP 1 Rip Rap 2sy
Station 99+50 - Drop Inlet 1 each
18" RCP 85 lf
18" FES 1 each
TP 1 Rip Rap 2sy
Station 177+50 - Drop Inlet 1 each
18" RCP 55 lf
18" FES 1 each
TP 1 Rip Rap 2sy
Station 178+50 - Drop Inlet 1 each
18" RCP 55 lf
18" FES 1 each
TP 1 Rip Rap 2sy
System P1-P2-Q1- Drop Inlet 3 each
18" RCP 675 lf
18" FES 1 each
TP 1 Rip Rap 2sy
System Q2- Drop Inlet 1 each
24" RCP 140 lf
24" FES 2 each
TP 1 Rip Rap 2sy
Total- Drop Inlet 9 each
18" RCP 935 lf
18" FES 5 each
24" RCP 140 lf
24" FES 2 each
TP 1 Rip Rap 12sy

Alternative design

System P1-P2-Q1- Drop Inlet 3 each
18" RCP 165 lf
18" FES 3 each
TP 1 Rip Rap 6sy
System Q2- Drop Inlet 1 each
36" RCP 140 lf
36" FES 2 each
TP 1 Rip Rap 3sy
Total- Drop Inlet 9 each
18" RCP 165 lf, 18" FES 3 each, 36" RCP 140 lf
36" FES 2 each
TP 1 Rip Rap 9sy

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0004-00(917) - P.I. No. 0004917 SR 25 Spur from Cate Rd. along CR 588/ Canal Rd. to SR 99, Glynn County	ALTERNATIVE NO.:	RD-13
DESCRIPTION:	Reduce the number of median inlets and outfalls	SHEET NO.:	8 of 8

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
18" RCP	LF	935	\$ 53.00	\$ 49,555	165	\$ 53.00	\$ 8,745
24" RCP	LF	140	\$ 55.00	\$ 7,700	0	\$ 55.00	\$ -
36" RCP	LF	0	\$ 94.00	\$ -	140	\$ 94.00	\$ 13,160
Drop Inlet	EA	9	\$ 3,500.00	\$ 31,500	3	\$ 3,500.00	\$ 10,500
18" FES	EA	5	\$ 700.00	\$ 3,500	3	\$ 700.00	\$ 2,100
24" FES	EA	2	\$ 750.00	\$ 1,500	0	\$ 750.00	\$ -
36" FES	EA	0	\$ 1,250.00	\$ -	2	\$ 1,250.00	\$ 2,500
TP 1 Riprap	SY	12	\$ 55.00	\$ 660	9	\$ 55.00	\$ 495
Sub-total				\$ 94,415			\$ 37,500
Mark-up at 10.00%				\$ 9,442			\$ 3,750
TOTAL				\$ 103,857			\$ 41,250

Estimated Savings:	\$62,607
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PROJECT DESCRIPTION

INTRODUCTION

The subject of the Value Engineering study is project STP00-0000-00(421) – P.I. No. 0000421. The project is for the extension and improvements to SR 25 Spur from Cate Road along CR 588/Canal Road to SR 99 in Glynn County, and accommodating improvements to SR 99.

PROJECT DESCRIPTION

This project consists of the extension of SR 25 Spur on 200 feet of proposed Right-of-Way. SR 99 will also be widened from an existing two lane facility to four lanes for approximately 2007 feet to the west and 2428 feet to the east before tapering back to an existing two lane facility on 200 feet of proposed Right-of-Way. The northern terminus for the project is the intersection of SR 99 and Canal Road. The southern terminus is the intersection of Cate Road and SR 25 Spur.

SR 25 Spur is classified as an urban collector. The proposed typical section will consist of two – 12 foot lanes in each direction, a 44 foot depressed grass median, and a 10 foot bike-able shoulder which will be 6.5 foot paved and 3.5 foot grassed on each side. The posted speed limit for SR 25 Spur will be 55 mph.

The length of the project is 2.10 miles for the SR 25 spur extension and 0.84 miles for SR 99 widening.

The project corridor is primarily undeveloped forest land and rural residential.

Because the corridor will be a new roadway, capacity analysis and level of service determinations could not be completed for existing conditions. However, for planning level analysis indications show the it would function at level of service B in the future are a four-lane highway.

NEED AND PURPOSE

Traffic volumes are expected to be at 6,000 vpd in 2010 with growth projections at 24,500 vpd in design year 2030. Truck volume is projected at 4%.

The project is included in the local bicycle route for Glynn County.

SR 25 Spur extension will provide an important link in the hurricane evacuation routes for the area. It provides access to I-95 and SR 99 which will aid in the mitigation of traffic during a hurricane evacuation.

The estimated construction cost for the project is projected at \$12,172,277. In addition, Right-of-Way costs are projected at \$407,400 and reimbursable utilities at \$12,500. The projected total cost for the project is \$12,592,177.

The design for the project has been prepared by **Thomas & Hutton Engineering Company**.

REPRESENTATIVE DOCUMENTS

- Georgia Department of Transportation
 - Construction Cost Estimate
 - Concept Report
 - Project Location Map
 - Traffic Analysis
 - Typical Road Section

The VE Team utilized the GDOT supplied project materials noted above plus the preliminary plans provided by Thomas & Hutton Engineering Company.

Estimate Report for file "0000421"

Section ROADWAY					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	250000.0	TRAFFIC CONTROL -	250000.0
201-1500	1	LS	300000.0	CLEARING & GRUBBING -	300000.0
207-0203	1300	CY	45.0	FOUND BK FILL MATL, TP II	58500.0
210-0100	1	LS	500000.0	GRADING COMPLETE -	500000.0
310-5060	65700	SY	15.0	GR AGGR BASE CRS, 6 INCH, INCL MATL	985500.0
310-5080	101600	SY	16.0	GR AGGR BASE CRS, 8 INCH, INCL MATL	1625600.0
402-3121	20800	TN	60.0	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	1248000.0
402-3130	20700	TN	65.0	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	1345500.0
402-3190	21900	TN	70.0	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	1533000.0
413-1000	82700	GL	2.0	BITUM TACK COAT	165400.0
441-0016	800	SY	43.0	DRIVEWAY CONCRETE, 6 IN TK	34400.0
441-6012	1800	LF	15.0	CONC CURB & GUTTER, 6 IN X 24 IN, TP 2	27000.0
456-2012	5	GLM	740.0	INDENTATION RUMBLE STRIPS - GROUND-IN-PLACE (CONTINUOUS)	3700.0
634-1200	20	EA	100.0	RIGHT OF WAY MARKERS	2000.0
Section Sub Total:					\$8,078,600.00

Section Erosion Control					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	30	AC	750.0	TEMPORARY GRASSING	22500.0
163-0240	260	TN	275.0	MULCH	71500.0
163-0300	6	EA	2000.0	CONSTRUCTION EXIT	12000.0
163-0520	1700	LF	20.0	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	34000.0
163-0522	200	EA	95.0	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - TYPE A SILT FENCE	19000.0
163-0550	45	EA	210.0	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	9450.0
165-0010	91000	LF	2.0	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	182000.0
165-0030	18018	LF	2.0	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	36036.0
165-0040	500	EA	57.0	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	28500.0
165-0105	100	EA	91.0	MAINTENANCE OF INLET SEDIMENT TRAP	9100.0
171-0010	30250	LF	3.0	TEMPORARY SILT FENCE, TYPE A	90750.0
171-0030	36036	LF	5.0	TEMPORARY SILT FENCE, TYPE C	180180.0
603-2180	100	SY	51.0	STN DUMPED RIP RAP, TP 3, 12 IN	5100.0
700-6910	30	AC	1250.0	PERMANENT GRASSING	37500.0
700-7000	10	TN	70.0	AGRICULTURAL LIME	700.0
700-7010	65	GL	25.0	LIQUID LIME	1625.0
700-8000	16	TN	370.0	FERTILIZER MIXED GRADE	5920.0
700-8100	1250	LB	3.0	FERTILIZER NITROGEN CONTENT	3750.0
Section Sub Total:					\$749,611.00

Section Miscellaneous					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
153-1300	1	EA	77500.0	FIELD ENGINEERS OFFICE TP 3	77500.0
Section Sub Total:					\$77,500.00

Section Drainage					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-3101	180	CY	550.0	CLASS A CONCRETE	99000.0
511-1000	18950	LB	2.0	BAR REINF STEEL	37900.0
550-1180	3650	LF	53.0	STORM DRAIN PIPE, 18 IN, H 1-10	193450.0
550-1240	350	LF	55.0	STORM DRAIN PIPE, 24 IN, H 1-10	19250.0
550-1300	400	LF	90.0	STORM DRAIN PIPE, 30 IN, H 1-10	36000.0
550-1360	550	LF	94.0	STORM DRAIN PIPE, 36 IN, H 1-10	51700.0
550-4218	47	EA	700.0	FLARED END SECTION 18 IN, STORM DRAIN	32900.0
550-4224	6	EA	750.0	FLARED END SECTION 24 IN, STORM DRAIN	4500.0
550-4230	6	EA	950.0	FLARED END SECTION 30 IN, STORM DRAIN	5700.0
550-4236	8	EA	1250.0	FLARED END SECTION 36 IN, STORM DRAIN	10000.0
603-2024	175	SY	55.0	STN DUMPED RIP RAP, TP 1, 24 IN	9625.0
603-2182	275	SY	45.0	STN DUMPED RIP RAP, TP 3, 24 IN	12375.0

603-7000	450	SY	6.0	PLASTIC FILTER FABRIC	2700.0
668-2100	43	EA	3500.0	DROP INLET, GP 1	150500.0
668-2105	6	EA	3000.0	DROP INLET, GP 1, SPCL DES	18000.0
668-2110	5	LF	200.0	DROP INLET, GP 1, ADDL DEPTH	1000.0
668-2233	2	EA	5500.0	DROP INLET, GP 1, MODIFIED TP M-3	11000.0
668-4300	1	EA	2270.0	STORM SEWER MANHOLE, TP 1	2270.0
Section Sub Total:					\$697,870.00

Section Signing & Marking

Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	200	SF	17.0	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	3400.0
636-1033	435	SF	20.0	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	8700.0
636-2070	1310	LF	9.0	GALV STEEL POSTS, TP 7	11790.0
652-3501	4500	GLM	300.0	SKIP TRAFFIC STRIPE, 5 IN, WHITE	1350000.0
652-5452	26300	LF	0.2	SOLID TRAFFIC STRIPE, 5 IN, YELLOW	5260.0
652-6501	27400	GLF	0.2	SKIP TRAFFIC STRIPE, 5 IN, WHITE	5480.0
653-0120	71	EA	75.0	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	5325.0
653-0170	20	EA	95.0	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	1900.0
653-1704	230	LF	4.0	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	920.0
653-1804	550	LF	2.0	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	1100.0
653-6004	18000	SY	3.0	THERMOPLASTIC TRAF STRIPING, WHITE	54000.0
653-6006	3100	SY	3.0	THERMOPLASTIC TRAF STRIPING, YELLOW	9300.0
654-1001	10	EA	3.0	RAISED PVMT MARKERS TP 1	30.0
654-1003	550	EA	4.0	RAISED PVMT MARKERS TP 3	2200.0
654-1010	85	EA	32.0	RAISED PVMT MARKERS TP 10	2720.0
Section Sub Total:					\$1,462,125.00

Total Estimated Cost: \$11,065,706.00

Need and Purpose:

Background

Project STP-0000-00(421) consists of the extension of SR 25 SPUR in Glynn County. The project proposes to extend SR 25 SPUR from the intersection of Cate Road along the old Cate Road alignment to Canal Road to SR 99 on 200 feet of proposed right of way. SR 99 would be widened from an existing 2 lane facility to 4 lanes for approximately 2007 feet to the west and 2428 feet to the east before tapering back the existing 2 lane facility on 200 feet of proposed right of way. The northern terminus of this project is the intersection of SR 99 and Canal Road (CR 588). The southern terminus is the intersection of Cate Road and SR 25 Spur. Within the project area, SR 25 Spur is functionally classified as an urban collector. The typical section will consist of two – 12 foot lanes in each direction, a 44 foot depressed grassed median and a 10 foot bikeable shoulder, which consist of 6.5 foot paved and 3.5 foot grassed on each side.

The length of the proposed project is approximately 2.10 miles for the SR 25 SPUR extension and 0.84 miles for the SR 99 widening.

The project is identified and included in the Brunswick Area Transportation Study's 1995-2020 Long Range Transportation Plan, which was adopted in October, 1997. This Long Range Transportation Plan was subsequently revised and extended for the time frame of 2020 – 2025 in October 2000, and also included this project. In addition, this project is included in the Brunswick Area Transportation study's fiscal year 2002-2004 Transportation Improvement Program.

The project corridor is primarily undeveloped forest land and rural residential. In the area served by the project a proposed theme park, Steamboat City, is planned for an area east of Interstate 95 along the south side of SR 99. Construction of the new park will begin in the fall of 2004 with an anticipated opening of April 2006. The park itself is anticipated to ultimately attract approximately 1 million visitors per year. Commercial property at the intersection of SR 25 Spur extension and SR 99 will serve as an entrance area to the wildlife park.

Travel Demand

Canal Road is currently a ^{PAVED AS PART OF G-8 SUMMIT - HDL} dirt road that exists within the area of the proposed extension of SR 25 Spur to SR 99. Because the proposed extension will be a new roadway, capacity analysis and level of service determinations could not be completed for the existing conditions.

A planning level analysis of SR 25 Spur indicates that it would function at Level of Service B (LOS B) in the future as a four-lane divided highway. This analysis was completed using the Highway Capacity Manual procedure for multi-lane highways and includes the following assumptions:

- 24,500 vehicles per day
- peak hour proportion of 10%
- 60%-40% directional split
- level terrain
- base free-flow speed of 55 mph
- 4% truck volume

Safety

For the first half of 2001 (data provided by Glynn County), there was one accident at the intersection of Canal Road and SR 99; there were no injuries. Since the existing road (Canal Road) is undeveloped and only used by small amounts of local traffic, the accident data and traffic volume data are not statistically significant enough to produce accident rates.

The extension of SR 25 Spur will be classified as an Urban Collector. Between 1995 and 1998, statewide accident rates for Urban Collectors in Georgia averaged 473 accidents per 100 million vehicle miles traveled. The injury accident rate for Urban Collectors was 132 injury accidents per 100 million vehicle miles; the fatal injury accident rate was 1.19 fatalities per 100 million vehicle miles.

Other

The project is included in the local bicycle route for Glynn County. The Brunswick area Transportation Study (Brunswick MPO) made an admendment to the local bicycle route on April 19, 2004. The project is not on a route designated in the GDOT Statewide Bicycle & Pedestrian Plan. SR 25 Spur provides access for northeastern Glynn County to I-95 and the designated Hurricane Evacuation Routes of US 341/ US 25, SR 32 and US 82/SR 520. This SR 25 Spur extension provides an important link in the Hurricane Evacuation routes for the area. It provides access to I-95 and SR-99 which will aid in the mitigation of traffic during a hurricane evacuation.

There are several other proposed projects in the area:

Project Consturction Type	Project Number	P.I. Number	Limits	*Construction Year
SR 99 Widening/Reconstruction Range	STP-0001-00(036)	0001036	US 341 TO I-95	Long Range
I-95 Widening/Reconstruction	NH-IM-95-1(117)	511100	US 341 TO McIntosh County Line	2006
SR 25 Widening	STP -0001-00(039)	0001039	Altamaha Blvd to SR 99	Long Range
SR 99 Widening/Reconstruction	STP-0001-00(422)	0000422	I-95 to US 17/SR 25	Long Range

* "Construction Year" is as per the Brunswick Area Transportation Study's fiscal year 2002 - 2004 Transportation Improvement Program.

Description of the proposed project:

Project STP-0000-00(421) Glynn County is the proposed extension of SR 25 Spur from the end of the existing SR 25 spur widening area at realigned Cate Road, along the old Cafe Road alignment, turning down Canal Road (CR 588) to the intersection of SR 99 and Canal road. The project will accommodate anticipated residential and commercial growth, the proposed theme park developed by Wildlife Realty and Associates and hurricane evacuation needs for Coastal Glynn County. The proposed project length consists of Approx. 2.1 miles of SR 25 Spur and 0.84 miles along SR 99.

Project Concept Report page 5
Project Number: STP-0000-00(421)
P. I. Number: 0000421
County: GLYNN

Is the project located in a Non-attainment area? Yes No.

PDP Classification: Major Minor

Federal Oversight: Full Oversight (), Exempt(X), State Funded (), or Other ()

Functional Classification: Urban Collector

U. S. Route Number(s): N/A State Route Number(s): SR 25 Spur

Traffic (AADT):

Current Year: (2010) 6,000

Design Year: (2030) 24,500

Existing design features:

- Typical Section: **SR 25 Spur: 4 – 12 foot lanes with 40 foot depressed median, 10' rural shoulders. Canal Road – 30' Dirt Road (includes shoulders), however 20' of the dirt road has been paved because of the G8 summit.**
- Posted speed **55 mph (SR 25 Spur), 35 mph(Canal) and 55 mph (SR 99)**
- Minimum radius for curve: 818'
- Maximum super-elevation rate for curve: 4.0%
- Maximum grade: 2 % - mainline, crossroads and drives.
- Width of right of way: **60 foot (Canal), 80 foot (Cate), 200 foot (SR 25 Spur) and 100 foot (SR 99).**
- Major structures: None (List all bridge structures including length, width, and sufficient rating).
- Major interchanges or intersections along the project:
 1. **SR 25 Spur and Cate Road Intersection**
 2. **Canal Road and SR 99 Intersection**
- Existing length of roadway segment and the beginning mile logs for each county segment. For new location projects, the existing length of roadway is zero (0).
2.10 Miles (SR 25 Spur Extension)
0.84 Miles (SR 99)

Proposed Design Features:

- Proposed typical section(s):
 - The proposed typical section will continue the existing SR 25 Spur section: 2 – 12 foot lanes in each direction divided by a 44 foot depressed median with 10 foot bikeable outside shoulders (6.5 foot paved and 3.5 foot grassed).
- Proposed Design Speed Mainline 55 mph
- Proposed Maximum grade Mainline 2%
- Maximum grade allowable 7%.
- Proposed Maximum grade Side Street 2 %
- Maximum grade allowable 15 %.
- Proposed Maximum grade driveway 6 %
- Proposed Minimum radius for curve 1433'
- Minimum radius allowable 1065'
- Proposed Maximum super-elevation rate for curve: 6.0%
- Proposed right of way:
 - Width **200 foot (SR 25), 200 foot (SR 99 West) and 150 (foot SR 99 East).**
 - Easements: Temporary (X), Permanent (X), Utility (X), Other ().
 - Type of access control: Full (), Partial (), By Permit (X), Other ().
 - Number of parcels: 9 Number of displacements:
 - Business: 0
 - Residences: 0
 - Mobile homes: 0
 - Other: 0
- Structures:
 - Bridges - NONE
 - Retaining walls – NONE
 - Box Culvert - **An 8' X 4' box culvert is proposed at station 89+50, as illustrated in the conceptual layout, to accommodate 706 Acres of drainage. The proposed box culvert will replace an existing 36 inch reinforced concrete pipe.**
- Major intersections and interchanges.
 1. **SR 25 Spur and Cate Road.**
 2. **SR 99 Intersection at northern project Terminus.**
- Traffic control during construction: Cate and Canal Roads will continue to carry traffic during the extension of SR 25 Spur. No offsite detours will be needed. Once construction is complete traffic will be routed on the SR 25 SPUR extension and Cate and Canal Roads will not be operational.

Project Concept Report page 7
 Project Number: STP-0000-00(421)
 P. I. Number: 0000421
 County: GLYNN

• Design Exceptions to controlling criteria anticipated:

	<u>UNDETERMINED</u>	<u>YES</u>	<u>NO</u>
HORIZONTAL ALIGNMENT:	0	0	(X)
ROADWAY WIDTH:	()	0	(X)
SHOULDER WIDTH:	()	0	(X)
VERTICAL GRADES:	0	0	(X)
CROSS SLOPES:	()	0	(X)
STOPPING SIGHT DISTANCE:	0	0	(X)
SUPERELEVATION RATES:	()	0	(X)
HORIZONTAL CLEARANCE:	()	0	(X)
SPEED DESIGN:	0	0	(X)
VERTICAL CLEARANCE:	()	0	(X)
BRIDGE WIDTH:	()	0	(X)
BRIDGE STRUCTURAL CAPACITY:	()	0	(X)

• Design Variances; **NONE**

• Environmental concerns:

- Wetland Impacts – Approximately 7.5 Acres of wetland impacts. Section 404 Jurisdictional Wetlands.
- Cultural Resources – Cultural resources survey pursuant to Section 106 of the National Historic Preservation Act of 1966.
- Endangered species – Threatened and endangered species survey pursuant to the Endangered Species Act of 1963.
- Noise – A Noise Impact Assessment will be made in compliance with 23 CFR Part 772 of the FHWA's guidelines for the assessment of highway generated noise.
- COE Individual Permit Required

Level of Environmental Analysis:

- Are Time Savings Procedures appropriate? Yes (), No (X),
- Categorical exclusion (),
- Environmental Assessment/Finding of No Significant Impact (FONSI) (X), or
- Environmental Impact Statement (EIS) ().

Utility Involvements:

- Georgia Power Company – Distribution
- Bellsouth
- Glynn county Water & Sewer
- Adelphia - CATV

Project Concept Report page 8
Project Number: STP-0000-00(421)
P. I. Number: 0000421
County: GLYNN

Project responsibilities:

- Design, GLYNN COUNTY
- Right of Way Acquisition, GLYNN COUNTY
- Relocation of Utilities, GLYNN COUNTY
- Letting to contract, GA DOT
- Supervision of construction, GA DOT
- Providing material pits, CONTRACTOR
- Providing detours, CONTRACTOR

Coordination

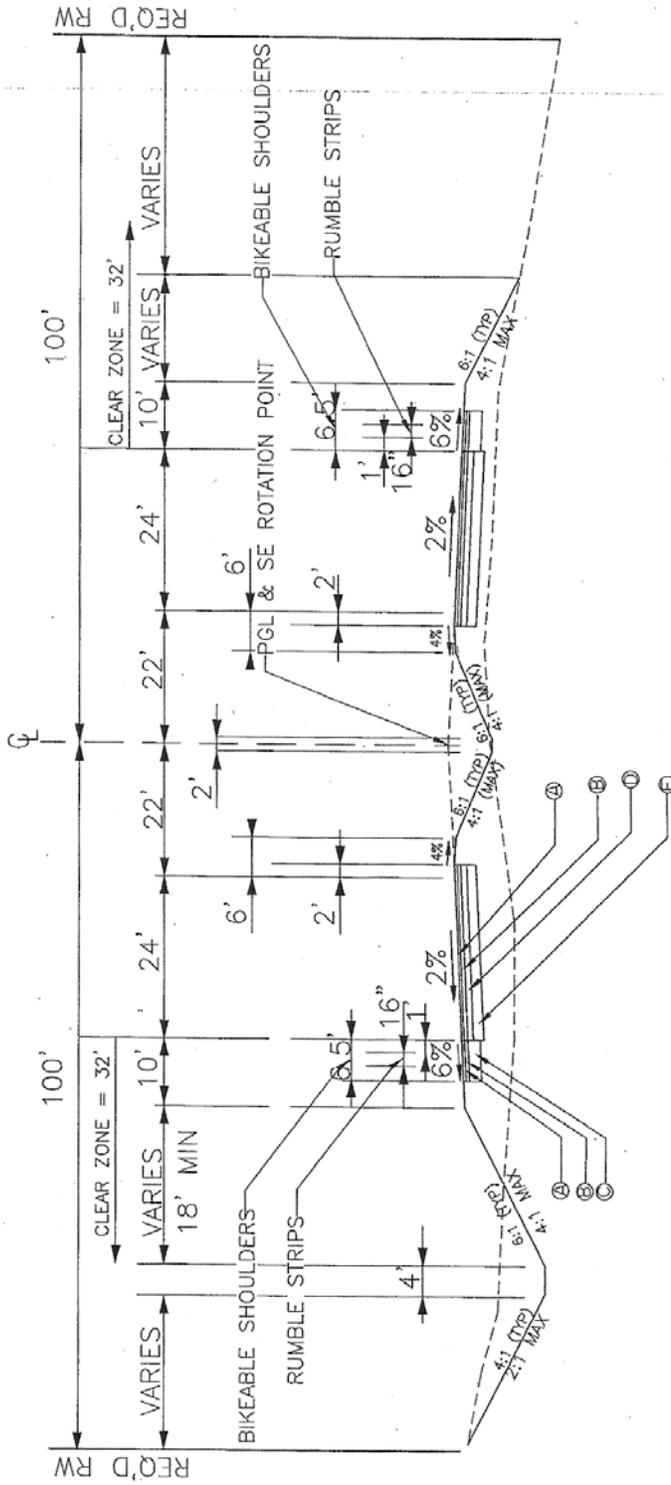
- **INITIAL CONCEPT TEAM MEETING HELD:**
Initial concept team meeting for this project held on November 10, 2003. Minutes attached.
- **CONCEPT TEAM MEETING HELD:**
Concept team meeting for this project held on February 27, 2004. Minutes attached.
- **PUBLIC INFORMATION OPEN HOUSE**
Public Information Open House was held within project limits at the Glynn County Fire Department Conference Room on May 11, 2004 from 4 P.M. to 7:00 P.M located at 235 Old Jesup Road in Brunswick, Ga. Eleven citizens attended the PIOH. Of the eleven citizens that attended, only three completed comment cards. The comments ranged from the need for traffic signals, moving up the time frame for construction and providing additional median breaks. The three citizens that completed the comment cards also noted that they were supportive of the project.
- P. A. R. meeting will be required.
- Local government comments.
- Other projects in the area. See Need and Purpose

Scheduling – Responsible Parties' Estimate

- Time to complete the environmental process: 24 Months.
- Time to complete preliminary construction plans: 6 Months.
- Time to complete right of way plans: 4 Months.
- Time to complete the Section 404 Permit: 9 Months.
- Time to complete final construction plans: 6 Months.
- Time to complete purchase of right of way: 4 Months.
- List other major items that will affect the project schedule: NA Months.

Other alternates considered: No Build

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TYPICAL SECTION
4 LANE SECTION W/ 44' DEPRESSED MEDIAN
NTS

- Ⓐ 1 1/2" 12.5 mm Superpave
- Ⓑ 2" 19 mm Superpave
- Ⓒ 4" 25 mm Superpave
- Ⓓ 8" GAB
- Ⓔ 12" CLASS II OR BETTER MATERIAL

**SR 25 SPUR EXTENSION
FROM CATE ROAD TO SR 99**
 PREPARED FOR
 GEORGIA DEPARTMENT OF TRANSPORTATION
 PREPARED BY
 THOMAS & HUTTON ENGINEERING CO.
 PROJECT NO.: STP-000-00(421) COUNTY: GLYNN
 DATE: 5/11/04

TRAFFIC ANALYSIS

CONCEPT REPORT FOR THE SPUR 25 EXTENSION FROM CATE ROAD TO GA 99

GLYNN COUNTY, GA

INTRODUCTION

Spur 25 in Glynn County is classified as an Urban Collector by the Georgia Department of Transportation functional classification system. When completed, the proposed extension will connect GA 99 to the existing four-lane section of Spur 25, which runs down to the City of Brunswick.

The extension of Spur 25 to GA 99 will, in essence, be a new roadway. Canal Road currently exists in the area of the proposed roadway, but is a dirt road with very little traffic. Because the proposed extension will be a new roadway, capacity analysis and level of service determinations were not completed for the existing conditions.

ACCIDENTS

For the first half of 2001 (data provided by Glynn County), there was one accident at the intersection of Canal Road and GA 99; there were no injuries. Since the existing road (Canal Road) is undeveloped and only used by small amounts of local traffic, the accident data and traffic volume data are not statistically significant enough to produce accident rates.

The extension of Spur 25 will be classified as an Urban Collector. Between 2000 and 2002, statewide accident rates for Urban Collectors in Georgia averaged 530 accidents per 100 million vehicle miles traveled. The injury accident rate for Urban Collectors was 132 injury accidents per 100 million vehicle miles; the fatal injury accident rate was 1.43 fatalities per 100 million vehicle miles.

TRIP GENERATION

A large amount of development is planned in the vicinity of Spur 25. Trips generated by the parcels surrounding the proposed Highway Spur 25 extension were estimated using the standard methodology and equations in the Institute of Transportation Engineers, Trip Generation, 7th Edition, 2003. The estimated future land uses for the area were taken from the Golden Isles Gateway Tract Master Plan; the amounts of development shown in the table are expected to be complete by 2030.

Table 1. Trip Generation

ITE TRIP GENERATION WEEKDAY RATES		
Land Use Code	Land Use	Total Daily Trips Generated
Parcels R6		
210	1200 single-family homes	10,200
Parcel Total		10,200
Parcels R7, and R8		
210	1200 single-family homes	10,200
Parcel Total		10,200
Parcels CR6		
310	375 unit Hotel	3,000
820	500,000 SF Commercial/Retail	19,300
Parcel Total		22,300
Parcels CR9		
310	475 unit Hotel	3,900
820	935,000 SF Commercial/Retail	29,000
Parcel Total		32,900

Source: Institute of Transportation Engineers, Trip Generation, 7th Edition, 2003

TRIP DISTRIBUTION BY PARCEL

Parcel R6

Access to Parcel R6 may be off of Spur 25 or GA 99. Most of the residential units will likely access Spur 25, either to travel to Interstate 95 or to commercial parcels CR6 or CR9. The following trip distribution is assumed for trips to and from Parcel R6:

- 10% internal capture – or to commercial parcels CR6 or CR9
- 30% to access points on GA 99
- 60% to access points on Spur 25

Parcels R7 and R8

Access to these parcels will be via GA 99. Most vehicles traveling to Interstate 95 from these parcels will not travel on Spur 25, but will use the GA 99 interchange. A smaller percentage of vehicles will travel to and from Parcel CR6 and other locations south on Spur 25. The following trip distribution is assumed for trips to and from Parcel R7 and R8:

- 30% internal capture – or to Parcel CR9
- 10% to areas west on GA 99 (the US 341 area)
- 40% to areas east on GA 99 (Interstate 95)
- 20% to areas south on Spur 25

Parcel CR6

This parcel is located adjacent to the Spur 25 interchange with I-95. Most of the traffic accessing this parcel will be from the interstate and areas to the south. A lesser amount of traffic will come areas to the north along Spur 25. Trip distribution assumptions are as follows:

- 10% internal capture
- 65% to/from the Spur 25 Interchange
- 25% to/from Spur 25

Parcel CR9

This parcel is located near the intersection of Spur 25 and GA99. Most of the traffic accessing this parcel will be from the interstate and areas to the east. Since it is slightly closer to the GA 99 interchange than the Spur 25 interchange, more of the I-95 traffic will likely use GA 99. Trip distribution assumptions are as follows:

- 40% internal capture (within Parcels R6, R7, and R8)
- 30% to/from the GA 99 Interchange via GA 99
- 20% to/from the Spur 25 Interchange via Spur 25
- 10% to areas west on GA 99 (the US 341 area)

TOTAL TRIPS ON SPUR 25

Based on the above trip generation and distribution, it is estimated that the average daily traffic on Spur 25 will be approximately 24,500 vehicles per day in 2030. These trips include approximately 6,100 trips generated by Parcel R6, 2,200 trips generated in Parcels R7 and R8, 5,600 trips generated by Parcel CR6, and 6,500 trips generated by Parcel CR 9. Approximately 4,000 trips are assumed as through trips that do not access any of the adjacent parcels.

The initial concept report for Phase 1 of the Spur 25 extension estimated approximately 15,000 vehicles per day on Spur 25 between GA 99 and Cate Road in 2020. This estimation, however, was made without the anticipated commercial development in Parcel CR9.

It is assumed that approximately 10 to 15% of the development shown in Table 1 will be in place by 2010. This new development, along with through traffic, would result in volumes of approximately 6,000 vehicles per day in 2010.

Daily volume estimates:

- 2010 – 6,000 vpd
- 2030 – 24,500 vpd

LEVEL OF SERVICE

A planning level analysis of Spur 25 indicates that it would function at Level of Service B (LOS B) in 2030 as a four-lane divided highway. This analysis was completed using the Highway Capacity Manual procedure for multi-lane highways and includes the following assumptions:

- 24,500 vehicles per day
- peak hour proportion of 10%
- 60%-40% directional split
- level terrain
- base free-flow speed of 55 mph
- 4% truck volume

VALUE ENGINEERING PROCESS

This report summarizes the analysis and conclusions by the PBS&J Value Engineering team as they performed a VE Study during the period of January 11 through January 14, 2010 in Atlanta, Georgia, for the Georgia Department of Transportation.

INTRODUCTION

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

Les M. Thomas, PE, CVS-Life	Team Leader
Luke Clarke, PE, AVS	Senior Highway Design Engineer
Kevin Martin, Esq., AVS	Highway Construction Specialist
Randy S. Thomas, CVS	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 Georgia Department of Transportation (GDOT) staff and its consultant. This briefing included discussions of the design intent behind the project, the cost concerns, and the physical project limitations. In the working session that followed, the VE Team developed cost models from the cost data provided by 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, cost estimate, and special provisions) 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 supposed to do?”, and “How is it supposed 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. A FAST diagram was prepared highlighting the projects required functions.

- The important functions of the project were identified as follows:
 - **Project Objective/Goals**
 - **Accommodate growth**
 - **Expand hurricane evacuation route**
 - **Extend existing Spur**
 - **Improve bicycle/pedestrian accommodations**
 - **Project Basic Functions**
 - **Fulfill contract between county and GDOT**
 - **Meet standards**
 - **Satisfy User**
- **Speculation Phase** - The VE team performed a brainstorming session to identify ideas that might help meet the project objectives:
 - **Eliminate any unnecessary work**
 - **Reduce median outfalls**
 - **Reduce lane width**
 - **Protect wetlands**
 - **Modify medians**

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
- Improve value
- Maintainability
- Ability to implement the idea
- General acceptability of the alternatives

- Constructability
- Scheduling delays

Based on these criteria, 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 whose rating was “4” or “5” because of time constraints. If time permitted, the team will develop additional recommendations. 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.

VALUE ENGINEERING STUDY AGENDA

for

Georgia Department of Transportation

Project No. STP00-0000-00(421)) – P.I. No. 0000421

SR 25 Spur from Cate Road along
CR 588/Canal Road to SR 99
Glynn County

January 11-14, 2010

Pre-Workshop Activities

VE Team Leader organizes study, coordinates with the Owner and Designer the project objectives and materials necessary. The VE Team receives and reviews all project documents. The team develops a Pareto Chart and/or Cost Model for the project.

Day One

9:00-10:30 Design Team Presentation (Information Phase)

- Introduction of participants, owner, designer, and VE team members
- Presentation of the project by the design engineer including:
 - History and background
 - Design Criteria and Constraints
 - Special “U” turn requirements
 - Special needs (schools, businesses, etc.)
 - Sidewalks, bicycle lanes, and or multi-use trails
 - Historical Property protection
 - Current Construction Completion Schedule
 - Project Cost Estimate and Budget Constraints
- Owner Presentation – special requirements, definition of life cycle period and interest rate for life cycle costs
- Review VE Pareto Chart/Cost Model
- Discussion, questions and answers
- Overview of the VE Process and Agenda – Workshop goals & project goals

10:30-12:00 VE Team reviews project (Information Phase)

- Review design team’s presentation
- Review agenda and goals of the study
- Visit project site if time permits

1:00-2:30 Function Analysis Phase

- Analyze Cost Model – Pareto
- Identify basic and secondary functions
- Complete Function Matrix/FAST Diagram

2:30-5:00 Creative Phase

- Brainstorming of alternative ideas

Day Two

8:00-10:00 Evaluation Phase

- Establish criteria for evaluation
- Rank ideas
- Identify “best” ideas for development
- Identify those ideas that will become Design Suggestions
- Develop a cost/worth analysis
- Identify a “champion” for each idea to be developed

10:00-5:00 Development Phase

- Develop alternative ideas design suggestions with assessment of original design and write up new alternatives including:
 - Opportunities & risks
 - Illustrations
 - Calculations
 - Cost worksheets
 - Life cycle cost analysis

Day Three

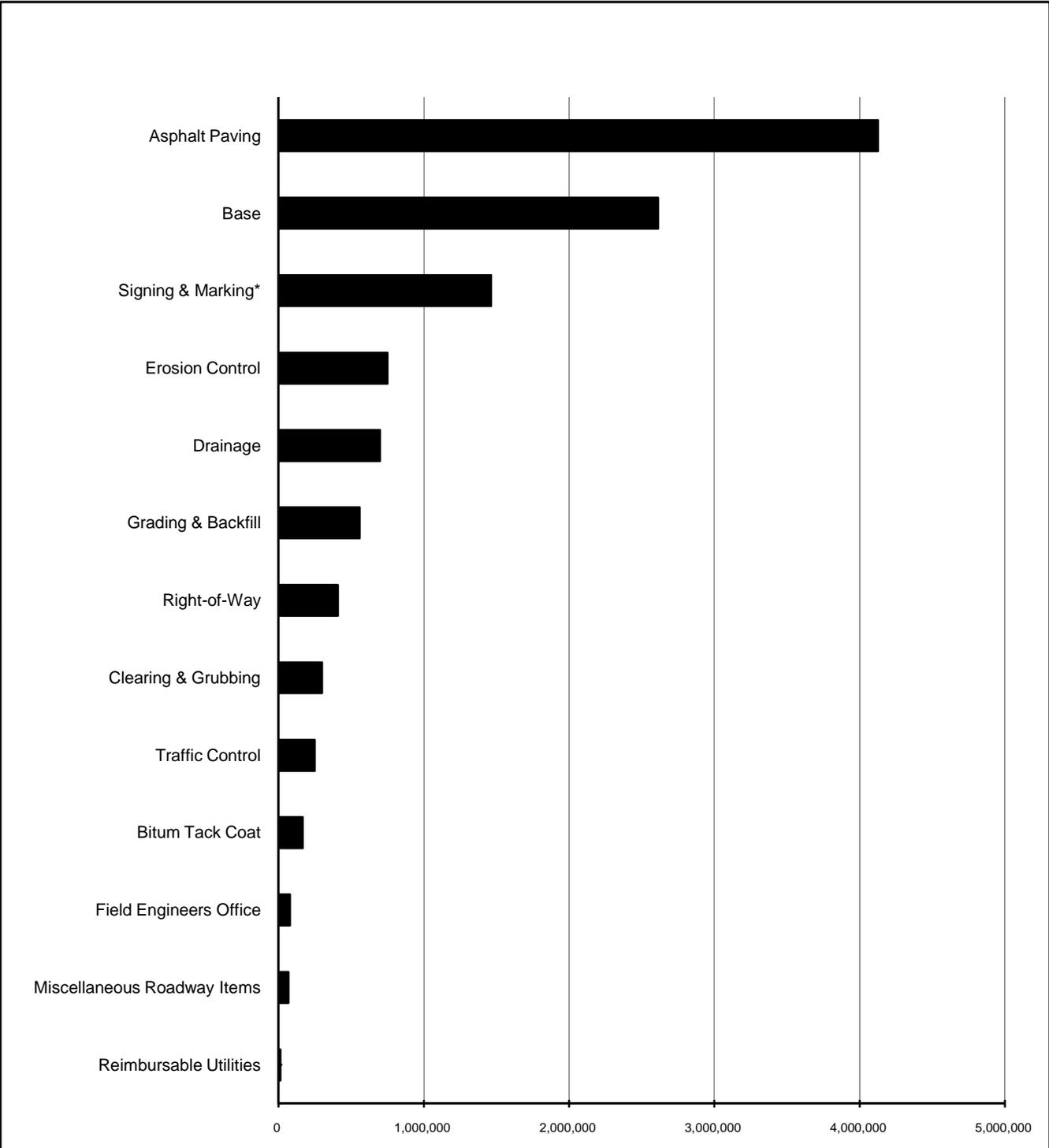
8:00-5:00 Development Phase

- Continue developing Alternative Ideas
- Continue developing Design Suggestions
- Prepare for presentation to Owners and Designers

Day Four

8:00-9:00 Prepare Presentation

9:00-10:00 VE Team Presentation



PARETO CHART - COST HISTOGRAM

PROJECT: Georgia Department of Transportation STP00-0000-00(421) - P.I. No. 0000421 SR 25 Spur from Cate Road along CR 588/Canal Road to SR 99 Glynn County			
			CUM.
PROJECT ELEMENT	COST	PERCENT	PERCENT
Asphalt Paving	4,126,500	35.93%	35.93%
Base	2,611,100	22.73%	58.66%
Signing & Marking*	1,462,125	12.73%	71.39%
Erosion Control	749,611	6.53%	77.92%
Drainage	697,870	6.08%	83.99%
Grading & Backfill	558,500	4.86%	88.86%
Right-of-Way	407,400	3.55%	92.40%
Clearing & Grubbing	300,000	2.61%	95.02%
Traffic Control	250,000	2.18%	97.19%
Bitum Tack Coat	165,400	1.44%	98.63%
Field Engineers Office	77,500	0.67%	99.31%
Miscellaneous Roadway Items	67,100	0.58%	99.89%
Reimbursable Utilities	12,500	0.11%	100.00%
*NOTE: The figure for SKIP Traffic Stripe-5inch white is shown as \$1,350,000 within this category is likely			
an error			
Construction Cost including ROW & Utilites	\$ 11,485,606		
Construction Cost less ROW & Utilites	\$ 11,065,706		
E & C Rate @10%	\$ 1,106,571		
Total Construction Costs	\$ 12,172,277		
Right-of-Way	\$ 407,400		
Utilities Reimbursement	\$ 12,500		
TOTAL	\$ 12,592,177		

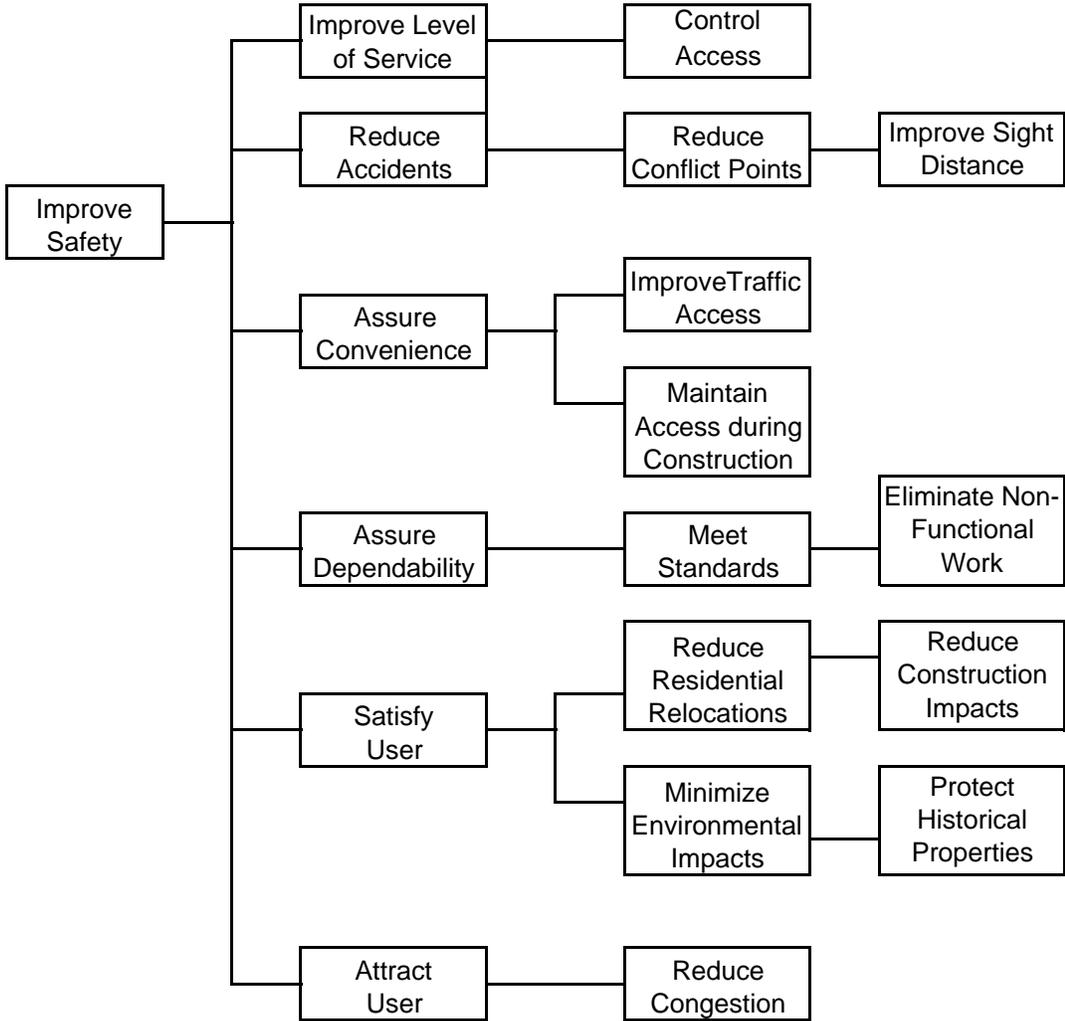
CUSTOMER FUNCTION/TASK DIAGRAM

Project No. STP-0000-00(421)

P.I. No. 0000421

Glynn County

SR 25 Spur from Cate Rd. along CR 588/ Canal Rd. to SR 99



DESIGNER PRESENTATION



MEETING PARTICIPANTS

Geogia Department of Transportation		January 11, 2010		
STP00-0000-00(421) - P.I. 0000421				
Glynn County				
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VE TEAM PRESENTATION



MEETING PARTICIPANTS

Geogia Department of Transportation		January 14, 2010		
STP00-0000-00(421) - P.I. 0000421				
Glynn County				
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